ISSN 2345-0282 ONLINE
http://doi.org/10.9770/s6723584739

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

12(2)
2024

Publisher
http://jssidoi.org/esc/home

Volume 12 Number 2 December 2024

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES

2024
12(2)

JCR Category: Business in *ESCI* edition

Entrepreneurship and Sustainability Issues
Journal Impact Factor™ (2023) 1.2 Q4
Journal Citation Indicator™ (2023) 0.33 Q3

The *Entrepreneurship and Sustainability Issues* ISSN 2345-0282 (online) is a peer-reviewed journal, which publishes original research papers and case studies. It is international journal published cooperating with universities, social companies, consultancies and associations indicated on the cover of the journal. It is published quarterly.

Areas of research include, but are not limited to, the following:

- **Areas of research include, but are not limited to, the following:**
- **Conceptual/Practical Approaches and Methodologies towards Sustainable Entrepreneurship**
- **Globalization, Internationalization and Solutions for Low-Carbon Economies of Scope or Scale**
- **Innovations and Technology Transfer Pilot Results Advancing Entrepreneurship and Sustainability**
- **Information Technologies (IT) and Information Communication Technologies (ICT) for Entrepreneurship Sustainability, and Socio-Economic Innovations**
- **Environmental Engineering for Sustainability and Entrepreneurial Applications/Ventures**
- **Smart Electricity Grid Solutions for Sustainable Entrepreneurship**
- **Implementation of Renewable Energies (e.g. Harvesting, Storage, New Technologies Being Deployed/Developed, Innovative Market or Business Model Paradigms, etc.)**
- **Entrepreneurship, Security and Safety**
- **Sustainable Development, Entrepreneurship, Safety**
- **Threats to Society, Entrepreneurship and Regional Development**
- **Security and Safety of Countries, Regions and Society as Precondition of Sustainable Development and Sustainable Entrepreneurship**
- **Boarder Guard Issues. Regional Development and Entrepreneurship**
- **Migration and Sustainable Regional Development and Entrepreneurship**
- **Terrorism, International Crime, Regional Development and Sustainability**
- **Security and Safety Models for Sustainable Development of Societies and Businesses**
- **Emerging Business Drivers, Opportunities, or Constraints in Future Sectors of Current Markets**
- **Retrofitting Techniques and Technologies Near-Zero Energy Demand Buildings**
- **Urban Planning and Advanced Construction Materials for Energy-Efficiency or Smart Cities**
- **Economy and Management in Public Administration and Regional Development**
- **Modern Economics in the Context of Security, Comfort, or Legislation**
- **PPPs for Developments in Sustainable Entrepreneurship, Finance, and Investments**
- **Accounting and Entrepreneurship Issues**
- **Sustainable Entrepreneurship in the Context of Management or Life-Long Learning**
- **Strategic Management Practices and Creative Marketing Techniques for Sustainability**
- **Organizational Studies and Sustainable Entrepreneurship**
- **Entrepreneurship in the Context of Marketing, ICT, and Creative Industries**
- **Intercultural Communication for Sustainable Entrepreneurship**
- **Institutions and Entrepreneurship**
- **Case Studies on Entrepreneurship and Sustainable Development**
- **Social Cohesion and Social Innovation and Social Entrepreneurship**
- **Business Models and Strategic Management for Sustainable, Secure and Safe Futures**
- **Corporate Social Responsibility and Sustainable Development**
- **Entrepreneurship in the Context of Psychology, Education, or Women**
- **Intuitions about Emerging Phenomena in Business and Society**
- **Start-Ups, Spin-Offs, SMEs in the Context of Market Growth And Exit**
- **Global Value Chain Management for Sustainable Entrepreneurship**
- **Knowledge Management for Sustainable Entrepreneurship, Safety and Security**

Editor-in-Chief

- *Prof.* Abel Femi Adekola, Wilkes University, USA

Editors

- *Prof.* Salvatore Monni, Rome Tre University, Italy
- *Prof.* Manuela Tvaronavičienė, Vilnius Gediminas Technical University, Lithuania
- *Prof.* Armenia Androniceanu, The Bucharest University of Economic Studies, Faculty of Administration and Public Management, Bucharest, Romania
- *Prof.* Edmundas Kazimieras Zavadskas, Vilnius Gediminas Technical University, Lithuania
- *Prof.* Fernando García, Department of Economics and Social Sciences, Faculty of Busines Administration and Management, Universitat Politecnica de Valencia (Polytechnic university of Valencia), Spain
- *Prof.* Małgorzata Porada Rochoń, Faculty of Management and Economics of Services, University of Szczecin, Poland
- *Prof.* Francisco Guijarro, Universitat Politecnica de Valencia (Polytechnic university of Valencia), Spain
- *Dr.* Nadia Simoes, Instituto Universitário de Lisboa (ISCTE-IUL), ISCTE Business School Economics Department, Portugal
- *Prof.* Michal Fabuš, School of Economics and Management in Public Administration in Bratislava
- *Director,* Mercy Maclean, Health Psychology Management Org. Services, United Kingdom
- *Prof.* Sharda Nandram, HAN University of Applied Sciences and Nyenrode Business University, the Netherlands
- *Prof.* Inga Žalėnienė, Mykolas Romeris University, Lithuania
- *Prof.* Kristel Mari Skorge, Oslo and Akershus University College of Applied Sciences, Norway
- *Dr.* Leonardo Piccinetti, Europe for Business, Brussels, Belgium
- *Prof.* Gunnar Prause, Tallinn University of Technology, Estonia
- *Prof.* Irina Sennikova, Riga International College of Economics and Business Administration, Latvia
- *Prof.* Natalja Lace, Riga Technical University, Latvia
- *Prof.* Ona Gražina Rakauskienė, Mykolas Romeris University, Lithuania
- *Prof.* Danuta Diskienė, Vilnius University, Lithuania
- *Prof.* Mirjana Radović Marković, Institute of Economic Sciences, Serbia
- *Prof. Ing.* Zuzana Dvorakova, University of Economics, Czech Republic
- *Prof.* Ani Matei, National School of Political Studies and Public Administration, Romania
- *Prof.* Givi Bedianashvili, European University, Ivane Javakhishvili Tbilisi State University, Georgia
- *Dr.* Kavita Singh, University of Delhi, India
- *Dr.* Ulku Yuksel, The University of Sydney, Australia
- *Assist.Prof.* Meltem Caber, Akdeniz University, Tourism Faculty, Turkey
- *Prof.* Bora Aktan, University of Bahrain, the Kingdom of Bahrain
- *Prof.* Svetlana Drobyazko, European Academy of Sciences, Coventry, UK
- *Prof.* Aleksandra Gawel, Poznan University of Economics and Business, Poland

Field editorial board members

- *MS. Ing.* Sylvain Robert, Commissariat a L'Energie Atomique CEA, Gif-sur-Yvette, France
- *Prof.* Wolfgang Birk, Computer Science, Lulea tekniska Universitet, Sweden
- *MSC.* Johan Desmedt, Unit Energy Technology, Genk, Belgium
- *Dr.* Edoardo Patti, Politecnico di Torino, Italy
- *Dr.* Ilias Lamprinos, Intracom Holdings SA, Telco Software Department, Greece

Volume 12 Number 2 December 2024

CONTENTS

Miglena Angelova
BUSINESS ORGANIZATION CREATIVITY – A KEY INDICATOR OF INNOVATION READINESS 10

Ema Peternel, Vladimir Bukvič
ASSESSMENT OF INVESTMENT RETURNS THROUGH THE PRISM OF INVESTMENT STRATEGIES: COMPARISON OF INVESTMENT RETURNS OF THE MOST SUCCESSFUL INVESTORS AND THE SLOVENIAN FUNDS 31

Shabir Ahmad, Ishtiaq Bajwa, Faisal Aftab, Chaudhry Kashif Mahmood, Kamran Siddiqui
DO TOP BUSINESS SCHOOLS CONSIDER ENTREPRENEURSHIP AS A CORE VALUE? 53

Ana Todorova, Irina Kostadinova, Nataliya Venelinova
EMPATHY AS A DRIVER OF SOCIAL ENTREPRENEURSHIP: INSIGHTS FROM THE BULGARIAN CONTEXT 71

Katarzyna Miszczak, Anatolijs Krivins, Valters Kaze
CHALLENGES AND DRIVERS OF GREEN AND SUSTAINABLE SPATIAL DEVELOPMENT: A CASE STUDY OF LOWER SILESIA AND LATVIA 85

Tsvetana Stoyanova, Kiril Anguelov
THE FUTURE OF UNIVERSITY EDUCATION – IS THE HEYDAY OF BLENDED LEARNING PROCESS COMING? 99

Margarita Išoraitė
INNOVATIVE MARKETING STRATEGIES IN ENTREPRENEURSHIP 117

Stanimir Stamatev, Miglena Angelova
UNVEILING THE RESILIENCE OF CREATIVE BUSINESS: NAVIGATING THE IMPACT AND RECOVERY PATH OF COVID-19 IN BULGARIA 127

Jonathan Mirvis
THE ENTREPRENEURIAL PROCESS OF SCHUMPETERIAN SOCIAL ENTREPRENEURS - A QUALITATIVE STUDY 148

Dana Jašková, Katarína Kráľová, Jana Sochuľáková
HIGH-PERFORMANCE WORK SYSTEMS AND THEIR IMPACT ON FINANCIAL PERFORMANCE IN SMES 163

Radoslav Ivančík, Pavel Nečas, Lucia Ľaščíková
ATTENTION AS A COMMODITY IN THE WORLD OF DISINFORMATION AND SOCIAL MEDIA 176

Jaroslav Sedlák, Jaromír Veber
QUALITY OF NON-FINANCIAL INFORMATION IN THE CONTEXT OF CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD) 193

Dagmar Camska, Lenka Svecova, Petra Kralova
ECONOMIC CONSEQUENCES OF WORK-RELATED DISORDERS 210

Ivan Dimitrov, Emanuila Antonova, Adile Dimitrova
EXPLORING THE IMPORTANCE OF LOGISTICS IN THE STRATEGIC BUSINESS DECISIONS OF BULGARIAN SMES 225

Ondřej Peclinovský, Robin Kunju Mol Raj, Harinaraynan Kayathingal
INVESTMENTS IN INDUSTRY 4.0 243

Josef Bureš, Nikola Sobotková, Vojtěch Bartoš
EVALUATION OF FINANCIAL PERFORMANCE OF ENGINEERING COMPANIES IN CZECH REPUBLIC AND CENTRAL EUROPE 262

Michal Konečný, Kateřina Kutová, Radim Dušek, Daniel Chamrada
ONLINE REPUTATION OF TRAVEL AGENCIES: AN EMPIRICAL STUDY ON THE CZECH MARKET 275

Ivan Dimitrov, Yoana Krumova, Adile Dimitrova
RESEARCH ON EMPLOYEE SUCCESS, PERFORMANCE, AND SATISFACTION IN THE BULGARIAN IT INDUSTRY 295

Ghada Alturif, Wafaa Saleh, Mohamed Ramadan A. Rezk, Mohammed Mahgoub Hassan, Leonardo Piccinetti, Alaa A. El-Bary
INNOVATIVE PATHWAYS TO A CIRCULAR ECONOMY IN SAUDI ARABIA AND ITS SPILLOVER EFFECTS ON THE ARAB REGION 314

Natália Vraňaková, Augustín Stareček, Zdenka Gyurák Babeľová
EVALUATION OF HRM PROCESSES DIGITALIZATION BY DIFFERENT GENDERS 333

Jiří Bečica, Roman Vavrek, Viera Papcunová, Michal Konečný
COVID-19 AS A FACTOR INFLUENCING MUNICIPAL BUDGETS: A CASE STUDY OF CZECH CONDITIONS 348

Irena Baláková, Michal Pšurný, Jana Stávková, Veronika Švecová
CHANGES TOWARD SUSTAINABILITY IN CONSUMER PURCHASING BEHAVIOR OF EVERYDAY PRODUCTS THROUGH IDENTIFIED DETERMINANTS 364

Horymír Kalmus, Marek Vochozka, Jarmila Straková
MANAGERIAL CONCEPTUALIZATION OF COMPETITIVE ADVANTAGE 378

Ghada Alturif, Wafaa Saleh, Alaa A. El-Bary, Radwa Ahmed Osman
USING ARTIFICIAL INTELIGENCE TOOLS TO PREDIC AND ALLEVIATE POVERTY 400

Zuzana Bobček, Alena Andrejovská
CATEGORISATION OF EU COUNTRIES IN TERM OF THE IMPACT OF CRISIS PERIOD ON VALUE ADDED TAX 414

Alexander Reinhold Werbik
CAPITAL AND INTERNATIONAL GROWTH: LESSONS FROM IT COMPANIES FOR SHAPING ENTREPRENEURSHIP IN THE AGE OF INDUSTRY 4.0 429

Vera Komarova, Janis Kudins, Aija Sannikova, Edmunds Čižo,
Oksana Ruza, Anita Kokarevica, Zane Zeibote
USING ARTIFICIAL INTELLIGENCE (AI) FOR LOCAL TERRITORIAL DEVELOPMENT: DATA-BASED MACHINE DIAGNOSTICS OF LATVIAN MUNICIPALITIES 443

Kristina Baziene, Justinas Gargasas, Surya Rajendran, Jordan Nathan Solomon
TOWARDS CIRCULAR ECONOMY THROUGH NOVEL WASTE RECYCLING TECHNOLOGIES 460

Samuel Body, Lukrécia Hunková, Katarína Havierniková
IMPACT OF HUMAN RESOURCE MANAGEMENT ORGANIZATIONS' PERFORMANCE: EMPIRICAL EVIDENCE FROM SMALL AND MEDIUM-SIZED ENTERPRISES IN THE SLOVAK REPUBLIC 473

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Publisher
http://jssidoi.org/esc/home

BUSINESS ORGANIZATION CREATIVITY – A KEY INDICATOR OF INNOVATION READINESS*

Miglena Angelova

University of National and World Economy, 8 Dekemvri str, 1700 Sofia, Bulgaria

E-mail: m.angelova@unwe.bg

Received 19 August 2023; accepted 29 November 2023; published 30 December 2023

Abstract. Organizational creativity is a key prerequisite for an effective company innovation policy. The overall innovation policy necessarily includes the attraction of creative employees to support the process of creating new products and services. At the same time, attracting and employing creative employees is a first but insufficient condition for obtaining a good level of organizational creativity. To be effective, these creative experts also have to be motivated, which now requires much deeper attention and overall policy from the organization's management. We studied the level of individual, team and organizational creativity among 384 employees that represent 71 companies in all economic sectors. Our findings clearly state that there is a difference between levels of individual, team and organizational creativity at the company. Employees do not reveal their full creative potential, as the main reason for that is lack of proper motivation and organizational support. Other barriers to creativity are also lack of good atmosphere, lack of confidence and transparency, lack of overall supportive organizational policy and excessive hierarchy and authoritarianism. At the same time, employees tend to define themselves as creative and the organizational management has to provide special and comprehensive policy to improve the level of organizational effectiveness of creativity.

Keywords: creativity; organizational creativity; competitive advantage; innovations

Reference to this paper should be made as follows: Angelova, M. 2024. Business organization creativity – a key indicator of innovation readiness. *Entrepreneurship and Sustainability Issues*, 12(2), 10-30. http://doi.org/10.9770/x8527586243

JEL Classifications: O31, M21, M51

1. Introduction

In today's highly competitive business world, creativity could be considered as a key prerequisite for a business organization's potential to be different, recognizable and offer goods and services tailored to the ever-increasing demands of its customers. On the other hand, creativity has many dimensions that are interrelated and are facilitated and/or hindered by the environment in which they develop: individual, team, and organizational. At the same time, we could explore creativity manifested in key management activities and functions - such as decision-making, tasks distribution between employees, organization and control, etc.

Our initial understanding is that creativity and the level of creativity of an organization is crucial to its competitiveness, providing various opportunities for its sustainable development. However, creativity is an exceptional characteristic of human intelligence, and in this sense, the potential of human resources in the organization, including creativity, is of critical importance.

* *The present article is prepared in implementation of the project BG05M20P001-2.016-C01 entitled "The Economic education in Bulgaria", financed by the Operational Programme Science and Education for Intelligent Growth, funded by European Union through the European Structural and Investment Funds.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Defining the level of overall organizational creativity could support the proper understanding of the organizational potential for innovations, which is crucial for its overall competitiveness. According to the initial understanding of the author of the current research, creativity is explored in three general different levels: individual, team and organizational creativity (covering organization strategy, supporting environment, such as free expression of opinions, ideas, and recommendations; communication processes – following any communication along the hierarchy as well as horizontal communication; organizational leadership and its reflection and impact on the creativity).

Therefore, the aim of the current article is to define the level of creativity of different business organizations using specific methodology for this purpose and, based on the collected data and their analysis – to make reasonable comments and recommendations for further improvements.

2. Literature review

The role of creativity in education, business and economy is explored and interpreted in different aspects by researchers. One of the leading topics within creativity is its role in the development of small and medium sized enterprises (SMEs), which is undeniable for overall economic development. For instance, Rumanti, Rizana and Achmad (2023) explore organizational creativity, direct connection to open innovation and, as a result – the overall performance of the enterprise. Their findings prove that both organizational creativity and open innovation have a significant positive impact on the overall SME performance. According to the author, organizational creativity consists of individual and group creativity (a common understanding among scientists), as well as the internal environment and knowledge. The authors argue that organizational creativity, perceived precisely in these four aspects, possesses the power to enhance the overall SME performance (ibid). Nguyen, Mai and Le (2023) examine the relations in the line organizational strategy – creativity and financial results of the company. Their findings indicate that adopting an inside-out perspective enhances organizational creativity but detrimentally affects financial performance.

In contrast, the outside-in perspective positively influences both organizational creativity and financial performance. Authors argue that organizational creativity not only boosts financial performance but also mediates the relationship between both perspectives and financial performance (ibid). Budiman, Rakhmawati and Purwitasari (2024) admit that in hyperconnected heterogeneous social networks, sociotechnical platforms can authentically and collaboratively facilitate the exchange of ideas, information, and knowledge both within and beyond organizational boundaries.

Hemonnet-Goujot, Ivens and Pardo (2022) pay attention to network creativity and develop a special framework, presenting the specific characteristics of network creativity based on the different multi-actors. Puccio and Schwartz (2023) examined how organizational creativity influences individual-level variables, including job satisfaction, engagement, motivation, intention to leave, absenteeism, and coping mechanisms in response to traumatic events. In this line of consideration comes the research of Bousinakis and Halkos (2021). According to the findings of their study, creativity uniquely serves as a driving factor capable of reducing stress while simultaneously fostering success, development, and high levels of satisfaction. Among the various factors, job-related creativity and the utilization of skills exert the greatest influence on satisfaction, followed by the physical distance from work, autonomy in actions, and compensation and benefits (ibid). At the same time, Di Prima, Cepel, Kotaskova and Ferraris (2024) consider that employee training, organizational knowledge sharing, and recruitment and selection processes are positively correlated with organizational creativity. Additionally, they admit that the use of HR analytics enhances these positive relationships (ibid). Paliwal, Rajak, Kumar and Singh (2022) find the relation between creativity and motivation and entrepreneurial intention.

An interesting view on individual creativity in the context of organizational creativity is presented by Carnevale et al. (2021). They conducted several studies on the creative process of creative people in organizations and found out that creative individuals, compared to their less creative colleagues, exhibit a tendency to seek less assistance related to creativity and to offer more help in this topic. According to the authors, this behaviour is attributed to their heightened concerns about maintaining a creative reputation. They also admit that

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

these tendencies are further amplified when these individuals have previously received help from others (ibid). In light of the creative process within the organization, the topic of sharing and the risk of stealing creative ideas logically comes up. Here, Ellis (2022) proposes comprehensive research. The author examines the interpersonal repercussions of idea theft in contrast to monetary theft. Through a series of experiments, the findings of the study reveal that individuals who steal ideas are perceived as having poorer character compared to those who steal money, resulting in a reduced willingness among others to offer them support as co-workers. Furthermore, the researcher argues that individuals are judged more harshly for stealing creative ideas as opposed to practical ones. Collectively, these results indicate that idea theft has substantial negative interpersonal consequences, adversely affecting co-worker relationships (ibid).

The role of human resource practices in the level of organizational creativity is also the focus of the researchers. For instance, the study of El-Kassar et al. (2022) indicates that the impact of implemented human resource practices on task performance is mediated by several factors: employees' perception of organizational support for creativity, their tendencies to hide knowledge, their creative output, and their innovative work behaviour. Mihova, Ivanova and Angelov (2022) also provide ideas for improving creativity and overall enterprise performance through the help of digitization of HRM, while Nikolova (2023) pays attention to the role of human resources in the context of Industry 4.0.

Gao, Zhao, Xu and Ma (2021) analyze the transition and link between individual and organizational creativity. They share the opinion that the individual creativity of the entrepreneur and, respectively, the founder of the enterprise could be considered as a starting point for the overall organizational creativity, especially when creative enterprises are concerned. At the same time, Jaboob (2023) focuses on the relationship between leadership styles and the level of individual creativity within the organization. The author found that four styles of leadership have significant positive effects on the individual creativity of employees: democratic, strategic, transformational and transactional. Complementary to this research is the study of Hanaysha (2023), who explores two contrasting leadership styles and their reflection on the individual employee level of creativity, namely authoritarian and participative. Logically, the findings of the author confirm that the participative leadership style positively affects individual creativity while the authoritarian style has no impact on the individual creativity of the employees (ibid). Xu, Yaacob and Cao (2024) also explore the relation between transformational leadership and employee creativity. The findings from their multilevel analyses revealed that transformational leadership exerts a significant positive effect on the innovation climate within teams, as well as on team reflexivity, psychological capital, and the creativity of employees. Cai, Fan and Wang (2023) pay attention to visionary leadership and its influence on creativity at different levels, especially in the context of goal-related processes within the organization. They reveal two cross-level effects: team-level visionary leadership enhances the relationship between individual-level visionary leadership and leader-follower congruence, while team goal commitment amplifies the impact of leader-follower goal congruence on employee creativity (ibid).

Creativity always comes with a high level of personal and team motivation. Some interesting research in this field in recent years has been proposed by Cui et al. (2024), who explore the role of knowledge sharing for motivation; Adeel et al. (2023), whose study is focused again on knowledge sharing and motivation, but this time in the context of the procrastination and creativity; Huang, Zhang and Zhu (2023), who explore the role of participating motivation in terms of idea sharing; Anguelov, Stoyanova & Tamosiuniene (2020), who pay attention on some important factors for motivation of creative persons. Wu and Zhang (2023) study the role of workplace fun on creativity. Scholars concluded, based on their findings, that workplace fun is positively associated with employees' creativity, with community embeddedness fully mediating the relationship between workplace fun and organizational embeddedness. Additionally, both community and organizational embeddedness serve as sequential mediators in the link between workplace fun and creativity (ibid). Yang and Chen (2023) also pay attention to the direct relationship between fun and the level of organizational creativity. Their findings support the positive impact of these two elements. The scholars argue that incorporating fun into the workplace can yield positive outcomes. However, according to them, managers should strive to cultivate an environment that not only encourages fun and creativity but also maintains high levels of productivity (ibid).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Some interesting researches are focused on the different approaches, methods and practices for enhancing individual and especially team creativity. For instance, Yang, Zhou and Yang (2024) find out that the use of humor by a leader was found to have a positive correlation with the team's ability to integrate knowledge effectively. She, Ma, Quan and Jiang (2024) explore the influence of the workaholism of the leader on individual and team creativity. They argue that workaholic leaders have a dual impact on employee creativity, exhibiting both positive and negative effects. On one side, such leaders can stimulate employees to view challenges positively, thereby enhancing creativity. Conversely, they can also lead employees to perceive obstacles, which may hinder their creative potential (ibid). Multiple team membership and its relation to the team creativity is examined by Chen et al. (2024). According to their findings, multiple team membership has a dual impact on creativity. On the positive side, it fosters creativity by enhancing a sense of thriving at work. However, they also pointed out that it has a detrimental effect on creativity by contributing to increased emotional exhaustion. Marozzo et al. (2024) found that individuals of creative teams with STEM background education who are willing to watch science fiction could be more productive than their colleagues. Talat, Khan, Chaudary, and Neale (2023) focused especially on the creativity of ICT companies and the options for enhancing it. Their findings indicate that managers in knowledge-intensive industries should encourage cognitive diversity and autonomy to enhance team sensemaking, which may, in turn, foster creativity. Zhu, Bauman and Young (2023) explore the emotional aspects of unlocking the creative potential of employees. However, Betancourt, Chen and Zhou (2023) admit that low power can make individuals more open to social influences that promote creativity, such as diversity, thereby enhancing their sense of inspiration and their expression of creativity.

An interesting starting point for research is taken by Lin et al. (2023), who focused on the perfectionistic expectations both from parents and/ or direct manager (supervisor) and its impact on the employee's creativity and fear of failure. They reveal that the indirect influence of parents' perfectionistic expectations on creativity, mediated by fear of failure, is amplified when supervisors also have high perfectionistic expectations.

Finally, when the management of a company plans and initiates the evaluation of the level of organizational creativity, it has to consider its normal workflow and secure the execution of parallel activities at high-efficiency level (Popov, Anguelov & Popova, 2021).

As it became clear from the literature review, creativity at the individual and organizational level is directly dependent on many factors that have different intensities and are manifested in different ways for individual employees. Major factors that undoubtedly influence the individual and team level of creativity are related to the organizational climate, the opportunities and freedom to share knowledge and ideas, the openness of the organization itself to various networks, and, last but not least, inspirational leadership.

3. Methodology of the research

The study's major aim is to define the level of creativity of enterprises operating in different sectors of the economy. In order to reach this major goal, we implemented consecutively the following tasks:
- to review the scientific articles on the topic from the last few years, and on the basis of this analysis to identify the key elements that would help to precise the defining the level of organizational creativity;
- to come up with the specific methodology relevant for the study, having in mind the possibilities to secure accessing to the enterprises in representing different sectors of economy;
- to prepare and conduct an empirical study among representatives of different companies;
- to analyze the obtained result and to propose key elements for defining the level of creativity of the business organization.

The initial understanding of the author is that creativity is one of the basic characteristics of a successful business nowadays. Creativity is a prerequisite for innovation, but also when creativity is converted to the special policy of an enterprise, it will lead (sooner or later) to the entire improvement of the company's performance. At the same time, creativity is a fusion of a good environment and organizational climate, enhancing knowledge sharing, new ideas and teamwork. As a result, to be creative, an employee has to be motivated first

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

and find a sense of self-cultivation (here, it should be emphasized that this motivation is not necessarily to be sought only in financial and material rewards).

The first hypothesis is that business organizations do not efficiently reveal the full potential of the creativity of their staff and creative teams.

The second hypothesis is that at the individual level, most of the employees tend to define themselves as creative, but due to a lack of specific organizational policy and support, they are not motivated and cannot show their creative potential.

As a result of the implementation of the first task, several key elements for the emergence of creativity could be highlighted (Fig. 1 and Fig. 2). In terms of individual creativity, we could define four major groups – self-cultivation, motivation, a mix of personal characteristics and mix of professional characteristics. Here these four groups, we can conditionally divide them into two basic (personal and professional characteristics) and two upgrading ones (self-actualization and motivation). Every employee possesses some creativity and can be the author of a new idea, but in general context our good creator or creative employee will be good professional (with a relevant level of education, expertise and experience) and at the same time this employee has to possess specific personal characteristics such as: self-confidence, dreamers, faith of its own abilities, positiveness, curiosity, flexibility, adaptability, do not fit into the conventional, ambitious etc. On the next level of individual creativity comes the motivation and self-cultivation. It has already been said that creative people are also motivated colleagues by default. Here, we will not dwell in detail on the actual process of motivation of creative people since this is not the focus of the present study. Still, we will emphasize that in most cases, in creative persons, motivation is even more individually focused and, to a much lesser extent, is influenced by the general organizational policy related to standard monetary incentives or material rewards. At the same time, self-actualization could be considered as a key factor for understanding the motivation of creative people. This self-actualization, similar to Maslow's pyramid, leads to the fulfilment of specific personal needs, including self-respect, the possibility of discovering inner potential, etc.



Fig. 1. Key elements for the individual creativity



Fig. 2. Key elements for the organizational creativity

When we explore the key elements of organizational creativity, we can divide them into four major groups: freedom, teamwork, organizational climate, and specific organizational policy. Here, collaboration and any kind of relations and partnership are important to secure a good level of organizational creativity. The first and absolutely requested specifically is freedom – to express oneself, to propose new ideas (regardless of how crazy and even absurd they could be at first glance), and to share these new proposals with colleagues and managers without any negative consequences for the author. The next step is to secure a smooth team working – this, from one side, is connected to the good selection of proper people – complementary in terms of expertise, experience and background to guarantee different viewpoints. On the other side, the effective team working process is a complex and multi-level activity, which requires efforts from each team member, a symbiosis

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

between the professional and personal characteristics of these members and, even more importantly – the desire to work together for the organizational purpose. The synergy between creative team members could happen only when each member approaches the creative process with an open mind, free of egoistic emotions, and focused on creating something new. In fact, this is difficult to achieve in practice, and that is the reason that the level of effectiveness between different creative teams varies. Therefore, the organization's climate and the overall organizational policy are tools to secure, support, and feed the team's creativity.

As a result of the second task, considering the major purpose of the study, the developed methodology of the study is presented in Table 1.

Table 1. Methodology of the study

N	Activity
1.	Preparation of the first draft of the questionnaire, covering key elements of individual and organizational creativity characteristics.
2.	Testing the first draft of the questionnaire with the specific focus group (2 groups of 5 persons, both employees and managers)
3.	Revision of the questionnaire according to the achieved recommendations and proposals from the focus groups
4.	The empirical study will be conducted among different companies (different sectors, sizes, finance resources, etc.).
5.	Data collection and analysis
6.	Identification of main findings from the empirical study
7.	Making a conclusion and proposal for assessment of the level of organizational creativity

The final version of the questionnaire contains 65 questions and statements in total, divided into four parts: Part A: Demographic characteristics of the responders; Part B: Questions collecting information for the self-assessment of the individual creativity of the responders; Part C: Question collecting information on the team creativity; Part D: Questions collecting information for the organizational creativity.

The first draft of the questionnaire was tested using 2 focus groups (each consisting of 5 persons). As a result of the proposals, the number of questions grew significantly, which predetermined the choice of the method of distribution of the questionnaire - not through the Internet (the risk of not filling out the questionnaire due to its size was serious), but through direct interviews with experts, managers and owners of enterprises. As a result of this major decision, the time for collection of primary information was expanded from the initially planned 3 to 8 months in real (from November 2023 until June 2024).

With specific planning (including using different experts and managers in practice as interviewers), the questionnaire was completed by a total of 384 respondents, representatives of a total of 71 enterprises located in the European Union. The profile of the companies entering the study is presented in Table 2 and Fig. 3, while the demographic characteristics of responders are in Table 3.

Table 2. Profile of the companies, entering in the research

Size of the company (by number of employees)	Micro	9	Small	24	Medium	21	Large	17
Years of existing	New company (less than 1 year)	6	Between 2 and 5 years	25	Between 6 and 10 years	26	Over 10 years	14
Main capital	Own	15	Foreign	18	Mixed financing	32	Public company	6

As can be seen from the Table 2 above, the major part of the companies that are entering this research are small enterprises (defined only by a number of their employees), followed by medium (21 enterprises) and large (17 companies). Micro enterprises are only 9.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Therefore, it could be said that the research covers all types of companies, but the results will be more applicable to small, medium and large companies rather than micro-enterprises. At the same time, in terms of years of existence, the companies are divided into 2 almost equal groups – between 6 and 10 years of experience (26 companies) and between 2 and 5 years of experience (25 enterprises). 14 enterprises have been established for over 10 years, while 6 are absolutely new – less than one year. The majority of the companies (32) have mixed financing (both their own and foreign); 18 of them are founded and operate only with foreign capital, which is almost equal to 15 companies that are founded with their own financial resources. Only 6 of the enterprises are with public financing – which means that they are total property of the government or municipality.

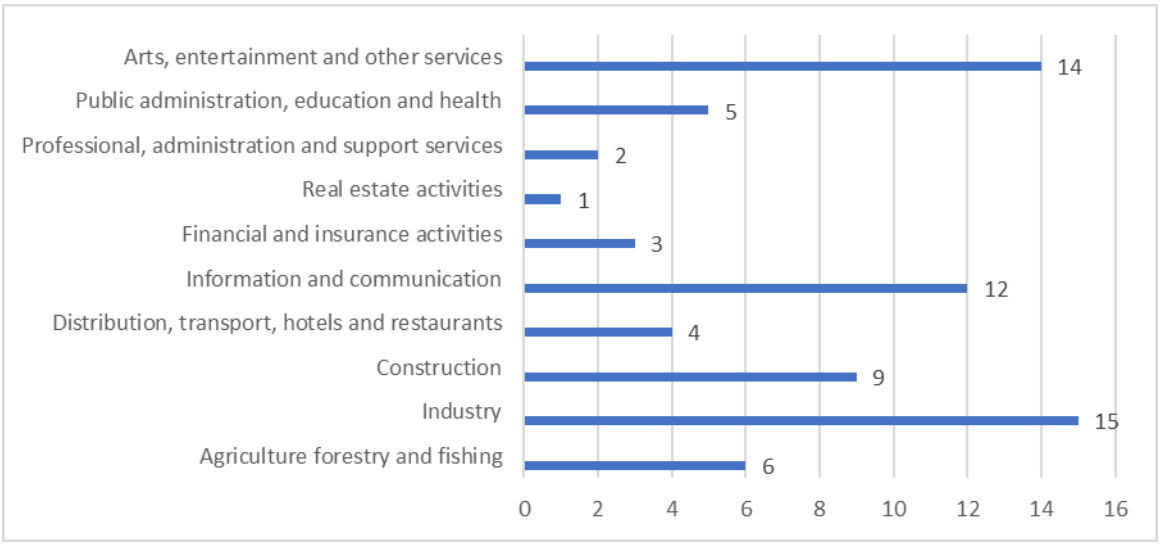


Fig. 3. Distribution of companies by economic sector, NACE classification (in number)

Companies entering the research cover all spectrum of NACE classification, even if their participation in the study is not equal. The smallest group, composed of only one representative, is the companies involved in real estate activities. At the same time, the industry sector has the largest number of representative firms (15), closely followed by enterprises in arts and entertainment (14). The third group is composed by the companies in the ICT sector (12) and the construction companies (9). This distribution was difficult to achieve due to the fact that in some sectors, the author has good relations with companies developed through the ears (creative business, construction, industry, ICT sector), while some sectors are less represented precisely because of the lack of a close relationship established so far. On the other side, companies in the financial sector were difficult to convince to participate in the study.

Table 3. Profile of the responders (in number)

Position of the company	High-level manager / owner of the business	42	Middle-level manager	117	Expert employee	225		
Age	From 18 to 30	96	From 31 to 40	87	From 41 to 50	138	Over 51	63
Gender of responders	Male	163	Female	210	I don't want to tell	11		
Years of experience within the company	Less than 1 year	54	Between 1 and 5 years	172	Between 6 and 10 years	76	Over 10 years	82
Last degree of achieved education	Secondary education	63	Bachelor degree	164	Master degree	132	PhD	25

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

As can be seen, most of the respondents are experts within the companies (225 or 59%), followed by representatives of the management teams (30%). Logically, the smallest group here are the high-level managers or the owners of the company (42 in total or 11%). This characteristic of the responders represents the actual logic of organizational structure. It could be considered a good base for the obtained results, covering all points of view within the company. Regarding the age of the responders, the principal group is formed by people between 41 and 50 (138 respondents or 36%), followed by the youngest group (96 people or 25% of respondents are employees between 18 and 30 years old). The third place is for people between 31 and 40 years (87 or 23%), and the last is for people over 51 years – 63 or 16%. The representation includes all groups (in terms of their age) and will secure the opinion of all working-age generations. Here, it is curious that the group of people over 50 years old is the smallest one – this is not the actual situation within the company. Still, maybe their small number is due to their lack of willingness to participate in the survey. However, the study was carried out voluntarily, and all participants were informed that the collected data would be used for scientific purposes only.

4. Analysis and discussion of the collected data

The first core part of the questionnaire (besides the part considering the profile of the responders and the company) collects information on the self-assessment of the responders for their creativity. This part is divided into 2 parts. The first one contains 10 statements, and the responders were asked to assess these statements through the 5-point Likert scale. The statements have a more general meaning, containing some phrases such as "sometimes", "very often", "most colleagues", etc., which purposely are rest for the responders to interpret according to their understanding. The results are visualized in Fig. 4.

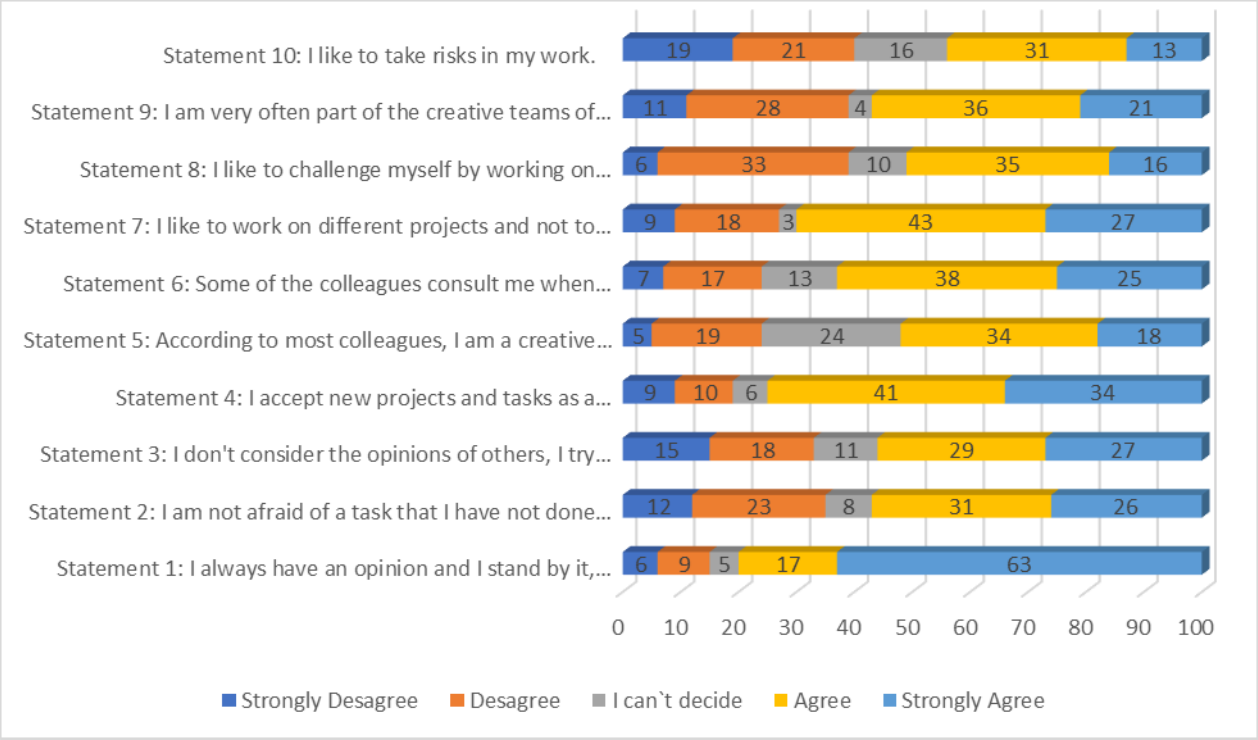


Fig. 4. Self-assessment on the individual creativity (in %, the total number of 384 answers)

Statement 1: I always have an opinion and stand by it, regardless of the consequences. This statement accumulates the most significant share of approval compared to the rest of this section of the questionnaire, with an impressive 80% in total, whereas 63% are strongly agreed upon. Another interesting thing here is connected to the relatively big share of uncertainty – 17% of respondents are not sure about their opinion.

Statement 2: I am not afraid of a task I have not done before. Here, the majority of respondents are in the agreement field of the scale, but this time, the group of people who have chosen only "agree" (31%) instead of

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

"Strongly agree" (26%) is bigger. At the same time, the group of people who directly disagreed with the statement increased (23%), especially compared to the previous statement.

Statement 3: I don't consider the opinions of others; I try to explain mine. At first glance, this statement could be interpreted as almost the same as Statement 1, and the difference in the accumulated answers could be surprising. However, this statement has other meanings on closer exploration and could be interpreted in two major ways. The first one is the emphasis on the second part of the statement – the effort to explain the individual opinion, and the second is the emphasis on the first part of the statement – that the responder is not so interested in the other's opinion but rather than his own. In this line of consideration, a relatively significant share of the people who disagree with this statement (33% in total) and those who cannot decide (another 11%) are answerable.

Statement 4: I accept new projects and tasks as a challenge to my professionalism. There are several statements in this sense of the questionnaire due to the fact that one of the leading characteristics of creative people is their eagerness to do totally new and different tasks. Here, the impressive part of our responders admit that they are open to new projects and tasks (75%), and only 19% respond negatively to this question. Another critical finding is the small share of responders who could not decide (only 6%).

Statement 5: According to most colleagues, I am a creative person. Here, the results are interesting – most respondents are still on the positive spectrum of answers. Still, their share seriously decreases, especially considering the answers to the previous questions. Here, the share of people who are not sure achieves the highest rate for all the sections (24%). In fact, this could be explained by the specifics of the question – responders were asked to present what their colleagues think of themselves. Some of the respondents may not have thought about this question before. It is possible that the environment in others does not tolerate expressing personal opinions, so the respondent is not familiar with this issue. On the other hand, it is also possible that the respondent feels undervalued in the company and has not revealed his potential, which is why his colleagues are unaware of his capabilities.

Statement 6: Some of my colleagues consult me when they are in an unfamiliar situation and do not know how to work it out. Again, similar to the previous answers, the majority of the answers were positive (63% in total), and 24% responded negatively. The critical understanding here is from one side, which is the internal organizational climate and policy of sharing, and from the other, it is the personal qualities of the responders. The presence of a creative person is not the only sufficient circumstance for having consultation between colleagues. Here comes the willingness of these creative people to give advice, recommendations, and opinions when requested by another colleague. On the other hand, here we have to consider the general meaning of the question – "sometimes" for some responders could be interpreted as usual activity, which is not very often, while for others, this could be just a sporadic event when a colleague asked for help.

Statement 7: I like to work on different projects and not do the same activities. This statement is similar to Statements 4 and 2, and it is not surprising that the results are similar. The focus in Statement 2 is on the new tasks at work and how they are perceived by the responders (as a threat or possibility); the accent of Statement 4 is put on the professionalism of responders, while here, the idea is to show the responders opinion on the trivial working activities. Again, most respondents had positive answers, confirming that they preferred to work on different and various tasks and projects (70% in total). Here, the share of unsure people is the smallest within this part of the questionnaire (only 3%).

Statement 8: I like challenging myself by working on pioneering projects. A supplement to the previous statement is this. Compared to Statement 7, here, the proportion of people answering positively is severely reduced (from 70% for Statement 7 to 51% for Statement 8). At the same time, the share of people who disagree increased significantly, from 21% overall for statement 7 to 39% for statement 8. This result is curious since creative people usually agree to work on a pioneering project (whether they are new, for the company, etc.). On the other hand, these projects are typically associated with a high level of risk, and here, this risk can

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

be seen as a burden and a threat to the safety of the work position. This may be one of the explanations why the rate of disagreement is highest for this part of the study.

Statement 9: I am very often part of the creative teams of my organization. 57% responded that they agree with this statement, 36% agree, and 21% strongly agree. This means that almost half of the people participating in our survey admit that their managers and colleagues assess them as creative. 39% in total claim disagreement – this could be interpreted in two significant lines of consideration. The first one could be the fact that the person has not shown the potential of his capabilities so far in the company - this may be due to objective factors such as insufficient experience in the relevant company, but also to circumstances such as a lack of a sufficiently supportive environment and ineffectiveness of the direct supervisor. At the same time, the second line of consideration comes from personal perception and interpretation of the "very often". Some people's participation could be considered insufficient due to individual goals and ambitions.

Statement 10: I like to take risks in my work. This general claim confirms the results already achieved in Statement 8 concerning working on pioneer projects. Here, the conservatism of the responders is the strongest – only 44% agree with the statement, and only 13% strongly agree. On the opposite side are people who strongly disagree – an impressive 19% of the responders. Combining the other 21% who disagree, here we have 40% of disagreement. At the same time, 16% of responders are not sure of their answer. This result could be interpreted as conservative and could be the result of associating the risk with the fear of job loss.

The next part of the questionnaire is again dedicated to individual creativity. Still, this time, responders have initially defined 10 qualities that are typical for creative people (based on the analysis of the scientific literature). Responders are asked firstly – to arrange them according to their own understanding (from most important, rated with 10, to the less critical quality for the effectiveness of the creative colleague – rated with 1) and secondly – to arrange them according to their assessment of the level they possess and exhibit these characteristics at the workplace. The results are presented in Table 4.

Table 4. Transformation of positions of individual creative qualities, assessed by an understanding of their contribution to work efficiency and their real possession and exhibition among the respondents

First Assessment: Individual creative qualities according to the understanding of their contribution to work efficiency			**Second Assessment: Individual creative qualities according to their real possession and exhibition among the responders**			**Transformation**			
N	***Quality***	***Score***	***N***	***Quality***	***Score***	**Quality**	**First Assessment position**	**Second Assessment Position**	**Change**
1.	Rich Imagination	8,43	**1.**	Intuition	7,56	Rich Imagination	1	7	**-6**
2.	Workaholics	8,38	**2.**	Ambitious	7,51	Workaholics	2	8	**-6**
3.	Communicability	7,69	**3.**	Sense of humor	7,08	Communicability	3	5	**-2**
4.	Ambitious	7,14	**4.**	Sense of self/ irony	6,58	Ambitious	4	2	**+2**
5.	Intuition	6,52	**5.**	Communicability	6,12	Intuition	5	1	**+4**
6.	Flexibility	6,18	**6.**	Curiosity	4,79	Flexibility	6	9	**-3**
7.	Curiosity	6,05	**7.**	Rich Imagination	4,23	Curiosity	7	6	**+1**
8.	Intransigence	5,27	**8.**	Workaholics	3,94	Intransigence	8	10	**-2**
9.	Sense of humor	4,33	**9.**	Flexibility	3,86	Sense of humor	9	3	**+6**
10.	Sense of self/ irony	3,08	**10**	Intransigence	2,42	Sense of self/ irony	10	4	**+6**

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Several interesting findings need to be further discussed and analyzed here. The general conclusion that could be made is that there are serious differences between the basic understanding of important qualities of a creative person at work and the real possession and the level of exhibition of the same quality in real working life. No one quality keeps its place according to these two different assessments. Something more – top 3 qualities are different. In the top 5, we already have 2 matches – for communicability and intuition, but they are put in another position.

Table 4 shows four of the 10 qualities have changed with a maximum difference (6 steps) in their initial position. Rich Imagination and Workaholics, which were in the first and second places of the ranking in the previous assessment, came in seventh and eighth positions in the second assessment. Therefore, their deviation is -6. On the other hand, two other qualities, at the first assessment, occupy lower places in the ranking sense of humour (9 position) and sense of self/ irony (10 position), in the second assessment for the actual quality implementation of a working environment, came on the third and four places (change + 6). The slightest change was made by quality curiosity – only 1 step difference between these two assessments. This part of the questionnaire reveals one exciting finding. There is a severe discrepancy between our understanding of the importance of the qualities a creative person should possess and what qualities manifest. It is quite another question whether, for example, the difference, especially in the positions of qualities such as rich imagination and workaholism, should not be nurtured purposefully by managers and the overall organizational policy to achieve better results among creative collaborators.

The next part of the questionnaire (Part C) collects information on the team's creativity. This part contains 20 statements, and the responders are asked to answer all of these statements using a 5-point Likert scale, focusing on the intensity of the claiming frequency. The results are presented in Fig. 5.

Statement 1: My team successfully generates new and creative ideas. The biggest group of responders chose "sometimes" as the most relevant option for their answer (35%), while the other 28% claimed "often". On the opposite side, 26% of people reported "always," and only 3 % said "never". This first statement for the team creativity section of the questionnaire gives an initial understanding of the overall process within each creative team – the creation of new ideas and proposals.

Statement 2: The creative proposals that the team makes are perceived positively by the assignor of the task. This statement speaks to the effectiveness and efficiency of the creative team. Here, the picture is slightly different from the first statement. For instance, the share of people with the answer "always" decreases from 26% for the first case to 13% for the second case. The share responders with answer "often" increases significantly (44%), while the group of people answering "sometimes" decreases from 35% to 31%. At the same time, the share of people who claim "rarely" remains the same.

Statement 3: My team encourages sharing non-traditional or innovative solutions. Here, only 20% in total reported negatively (8% for never and 12 for rarely), while the remaining 80% are distributed between sometimes (24%), often (37%, which is the biggest group for this statement) and always (19%). The results are not surprising because the central purpose of one creative team is to propose new and unconventional ideas. On the other hand, 20% of people answering "never" and "rarely" pose a question for further consideration – what are the criteria for a creative team to succeed? Obviously, in these 20% of people, their teams do not sufficiently secure the sharing and encouragement of generation new ideas.

Statement 4: The team I work in encourages the adoption of new and non-standard ideas. This statement is quite similar to the previous one. Therefore, the results are also identical, with slight differences, but the proportion between different groups remains the same as the last statement (6% claim never; 15% - rarely; 26% sometimes; 35% often and 18% - always).

Statement 5: My ideas and suggestions are taken into consideration. This statement collects information on the proper contribution of the concrete responders to the overall teamwork. The findings here deserve closer analysis. The majority (almost half of the responders – 43%) admit that the other members of the creative teams

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

partly recognize their efforts. 32% (20% for often and 12% consistently) claim positively in this statement. Conversely, 25% (12% – never and 13% - rarely) report negatively. In general, this means that approximately 20-25% (also having the answers to the previous statement in mind) of the creative teams are not functioning correctly.

Statement 6: The team atmosphere is open and supportive in discussing new ideas. The majority of responses focus on "sometimes" (38%), followed by a group of people answering "often" (25%). The same share of 14% possess the groups answering with "always" and "rarely". 9% of responders claim that the team atmosphere was never open and supportive. Again, 23% of the total respondents who responded with "never" and "rarely" could be considered indicators of inefficiency and low levels of effectiveness of the creative teams they work in.

Statement 7: The team I work with often experiments with new approaches and work methods, especially in generating non-traditional ideas. At first glance, this statement is similar to statement 1, but the accent is put on the new approaches and methods of generating new ideas. Almost 30% in total (12% for never and 17% for rarely) report in the negative zone of the answers.

This could be a testimonial that some of the creative teams (especially those with permanent staff) could elaborate and have their own rules and specific procedures for generating new ideas. On the other hand, the major group here claims sometimes (30%), followed by the group of people answering often (28%) and 13% of people who constantly use new approaches. Therefore, it could be concluded (based also on the answers to the other statements) that approximately 10-15% of creative teams are proactive and open. At the same time, the rest prefer, in general, working more conventionally.

Statement 8: My team adapts quickly and implements new ideas. Here, the focus is on the team's adaptability, which is one of the leading characteristics of the creative team. The majority of responses again are for "sometimes" (37%), followed by a group of often (22%) and people answering always (19%). At the same time, 16% of responders admit that their team is rarely adaptive, and another 6% claim never. The fact that most answers are focused on the neutral to positive perspective indicates these teams' readiness to be creative.

Statement 9: The creative team I work with usually has enough time to perform its task efficiently and effectively. It is not surprising that the impressive part of the respondents here (59% in total) is focused on the answers "never" (31%) and rarely (28%).

This statement accumulated the second largest number of people to answer negatively (see results for statement 16). In this context, only 5% report always and 11% choose the answer "often". This distribution of the answers between 5 options could be explained in two lines: first – time usually is the most deficient resource for the creative team, and second – time could be sufficient, but the time management within the creative team, including internal deadlines, tasks distribution etc. could be inefficient and to lead to the lack of enough time in general.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

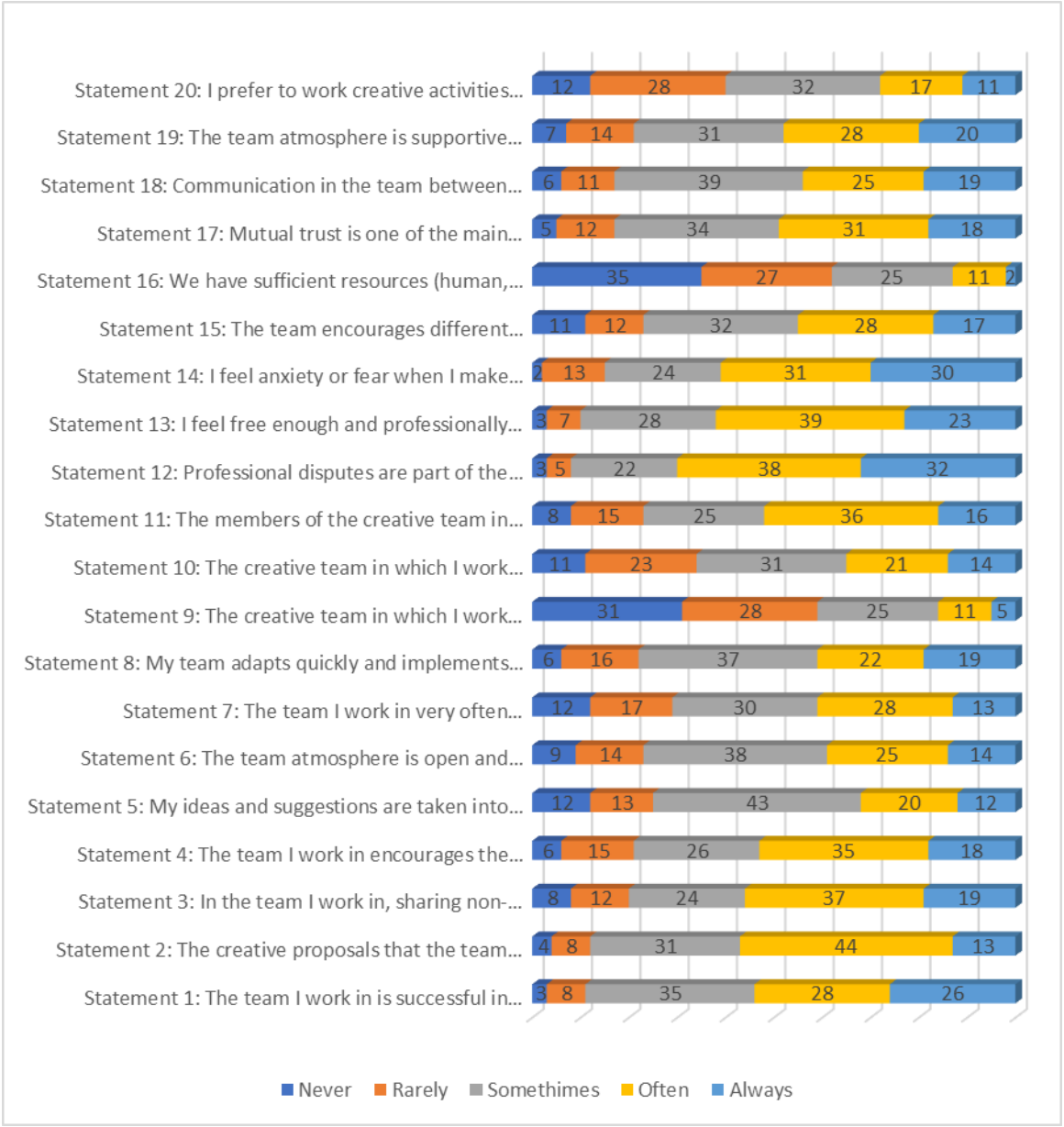


Fig. 5. Response distribution on the statement for the team creativity (in %)

Statement 10: The creative team I work with usually enjoys sufficient trust and, support and understanding from the organization's management. This statement collects information about the relationship between the creative team and the company's management. The majority of answers again are concentrated on the option "sometimes" (31%), followed by rarely (23%). The next group consists of people choosing the answer "always" (14%), and the last position is for people answering "never" (11%). This heterogeneous result indicates that the relationship between the line company's management and creative team has to be the focus of special attention, and the management has to put additional effort into securing a good and supportive working environment for the creative teams to show their best potential.

Statement 11: The creative team members in which I work support each other and approach each other with understanding and respect. The positive finding here is that most answers are "often". Adding to them the share of people who choose "always" (16%), we will have 52% in total, which is clear evidence that the relations between members generally are correct and professional. This consideration is additionally confirmed by the results achieved for the following statement.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Statement 12: Professional disputes are part of the daily work of the creative team in which I work. The major part of responses here is "often" (38%), followed by people claiming always (32%). The common share of these two groups is precisely 70%, which could be considered good evidence and proof of the professional relations established and developed between members of creative teams.

Statement 13: I feel free enough and professionally prepared to pitch my idea to other colleagues on the creative team. Almost 40% (39% precisely) of responders claim they often feel professionally prepared to propose their ideas to the other team members. Other 23% claimed always, while 28% said "sometimes". On the other hand, people responded negatively to this statement 10% in total, of which 3% chose "never" and 7% - rarely. This 10% could be considered as the creative teams' unrevealed potential to improve their efficiency and effectiveness. The organization's management should react and do all it needs to integrate these colleagues to present their real creative potential. At the same time, it is possible that some persons among these 10% are misgauged in the first place, and their inclusion in the creative teams could be considered as not a correct management decision.

Statement 14: I don't feel anxiety or fear when I make mistakes. The results of this question are curious because a supportive atmosphere is one of the essential characteristics of the efficient generation of new ideas. A good finding is that more than half of responders (in total 61%) choose "often" (31%) and always (30%). It could be considered that they have a stable position and a good environment with no additional burdens for self-expression and creation. 24% of responders admit that they only sometimes feel anxiety and fear when they make mistakes with the work of the creative team. These people must be further encouraged, including with practice examples, that mistakes in creative work are often a phenomenon and are usually part of everyday activities. Still, creating a really good final product (based on a good combination of all initial proposals) is necessary. 15% or all responders report negatively to this statement, which means that if they feel anxious and fearful, they are not in a condition to reveal the total capacity of their creative potential. Therefore, further efforts are needed to reduce the share of these people in creative teams.

Statement 15: The team encourages different perspectives and diversity of thought. The major group of responders here is concentrated on the answer “sometimes" (32%), followed by the group with "often" (28%) as a response. 17% of people choose "always", but on the other side, 23% in total (11% - never, 12% - rarely) consider that the team is not sufficiently supportive. One of the conclusions from this statement is that ¼ of the creative team members do not feel a supportive environment, which could be considered a severe barrier in front of the overall effective creative work.

Statement 16: We have sufficient resources (human, financial, time, etc.) to work efficiently and qualitatively on the creative tasks and projects assigned to the team. This statement is similar to Statement 9, but here we explore all types of resources. At the same time, in Statement 9, our interest was focused on time as one of the leading and important resources for the creative teams. Here, the situation is quite similar and even more clearly expressed. 35% of responders claim they never had a perfect situation where all requested resources were sufficient. Other 27% admit that such situations rarely happen at real work. 25% of responders reported "sometimes," and only 13% in total (11% often and 2% - always) were positive about the resources the team needed to do its tasks. Here we have again two lines of consideration – the first one – is that this is a typical managerial problem (secure effective resource planning and management), but on the other hand, it could be the problem within the creative teams – the way they work could be too much chaotic without paying attention to the important this such as deadlines and client's opinion.

Statement 17: Mutual trust is one of the main qualities of the team in which I work. This statement is complementary to Statement 15, and the results are similar. 34%, which is the biggest group of respondents, chose "sometimes", followed by the group claiming "often" (31%). These two groups comprise the majority of the respondents. The next group consists of people who believe their team always possesses mutual trust (18%). They are of the opposite opinion to the 17% of responders, who choose “never” (5%) and rarely (12%).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

Statement 18: Communication in the team between colleagues is open and direct, and if misunderstandings arise, they are resolved. Regarding the quality of communication within the creative teams, we have 39% sometimes claiming, followed by 25% with the answer "often", and the other 19% with maximum positive, choosing the answer "always". At the same time, responses of 17% are negative – 6% are sure that they never happen to them such type of communication, and the other 11 report "rarely".

Statement 19: The team atmosphere is supportive and I feel motivated to give my best. On this direct statement again, 21% of respondents expressed their negative opinion (7% never, 14% rarely). The rest of the answers were distributed between sometimes (31%, this is the major group of responders in this statement), 28% often and 20% - always.

Statement 20: I prefer to work together with other people than alone. This section of the questionnaire concludes with the statement, collecting information for the personal preferences of the creative teams' members – to work alone or with colleagues. Here, the strong individualists are 11% (choosing always as the answer), supported by others and 17%, claiming often. 32% preferred to be balanced in their response, selecting the option "sometimes". I am totally sure that their preference is on teamwork is 12% (very close to the share of people on the contrary opposite opinion), and the other 28% claim rarely.

The last part of the questionnaire is devoted to organizational creativity. For this purpose, we have 10 statements again and collect the opinion of the responders in the 5-point Likert scale of agreement (Fig. 6). As a general observation in terms of the distribution of answers between the 5 possible options, here responders are more reluctant and critical for the level of organizational creativity, especially comparing to the team and even more expressed – comparing to the individual creativity. Organizational management could increase the organizational infrastructure (in all its different aspects) for creativity.

Statement 1: My organization has a clear development strategy that includes innovations. The positive finding is that over 50% of responders believe their organization has such a strategy (34% - Agree; 22% - Strongly agree). Only 25% of responders claim the two levels of disagreement – (9% Strongly Disagree and 16% - Disagree). At the same time, 19% are not sure in their opinion. This result is positive, based on the finding that most companies have a clear idea of their development, including innovations.

Statement 2: My organization has clearly set goals for its strategic development, which I fully accept and share. This statement, in fact, is complementary to the previous one; this time, the focus is put on the acceptance and sharing of these organizational goals. Here, the results are not as enthusiastic as those in the previous statement. However, 35% of respondents (23% – Agree and 12% – Strongly Agree) agree. On the other hand, 46% of responders react negatively (18% strongly disagree and 28% disagree). The differences in responses between these two statements clearly state that almost half of people do not share the goals developed in the organizational strategy. This means that organizational management has to make specific efforts in two major lines – firstly – to involve as many employees as possible in the preparation and elaboration process of the company's development strategy. This will guarantee a higher level of acceptance because all involved people will be part of the process in elaborating the strategic document. They will understand the overall logic of the strategy deeply (being part of the team for the creation of the strategy, on the other hand, will lead to an increase in the level of effort put into its implementation). Secondly, the management has to pay additional attention to explaining the logic and overall understanding behind developing the organization's strategy.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

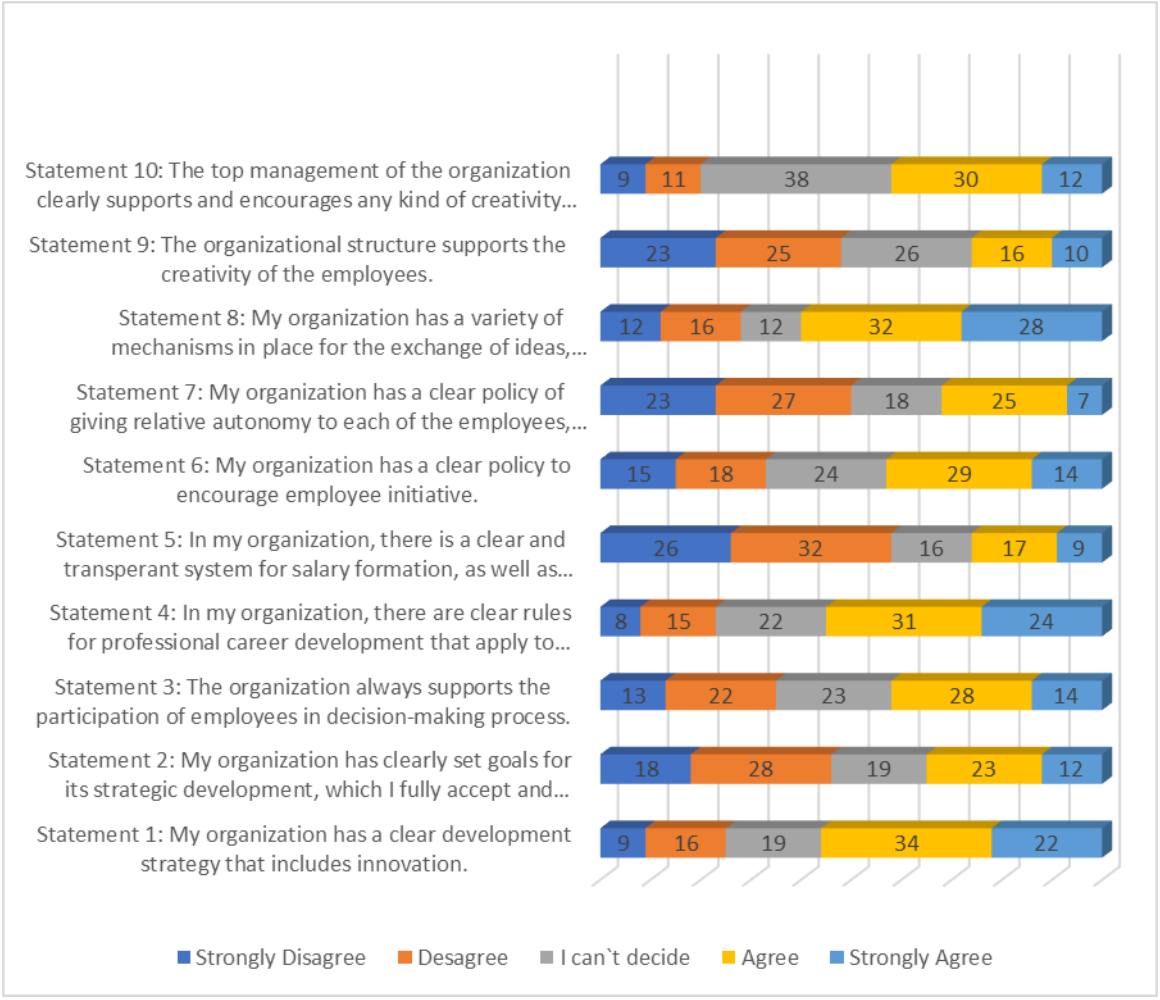


Fig. 6. Response distribution on the statement for the organizational creativity (in %)

Statement 3: The organization always supports the participation of employees in the decision-making process. The results here are similar to the results in the previous statement. 42% of agreement (28% - Agree and 14% - Fully Agree) and 35% are negative (13% Strongly Disagree and 22% Disagree). Here the share of people who are not sure is bigger than the previous statement – from 19% to 23%. This uncertainty could be found in the presence of "always" in the statement – it is possible that employees feel only sometimes the support of management in decision-making process.

Statement 4: In my organization, there are clear rules for professional career development that apply to everyone. Here, the statement's acceptance level is higher than the previous statement. We have % of responders who agree with this statement (31% - Agree; 24% - strongly agree). This finding is crucial for securing a transparent career development policy. Therefore, the motivation of employees will improve, knowing that all employees have equal chances and opportunities for hierarchical development in the organization. At the same time 23% express disagreement (8% - Strongly Disagree and 15% - Disagree). These people are challenged to be involved effectively in any creative activities due to their sense of inequity. Whether they have a right or not is another matter entirely. As a result, however, they will not put enough effort into creative activities, and the company management will have to overcome this problem effectively.

Statement 5: In the organization, there is a clear and transparent system for salary formation, as well as bonuses, which applies equally to everyone. When we analyze the result of this statement, we have to consider that the primary focus here is on the presence of a clear and transparent system in the company, which is obligatory for everyone within the organization. Here, we did not ask for approval for this system. Here, the majority's opinion is expectedly negative – 58% in total (26% Strongly Disagree, 32% - Disagree) against only 26% who

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

agree (17% - Agree, 9% - Strongly Agree). At the same time, 16% are not sure in their response. Considering this result, most companies have to provide a more transparent and proactive policy for explaining the overall system and policy for material and non-material staff stimulation.

Statement 6: My organization has a clear policy to encourage employee initiative. Here, the results are balanced, especially compared to the previous statement. 43% of responders agree with this statement (29% - Agree; 14% - Strongly Agree). 24% remain unsure, while another 33% disagree (15% Strongly Disagree and 18% - Disagree). This relatively high level of uncertainty could be transformed in a positive with specific activities initiated by management. At the same time, the part of employees who report negatively to this statement has to be further persuaded, including with particular internal policy.

Statement 7: My organization has a clear policy of giving relative autonomy to each employee within the limits of their competencies. Exact 50% of responses are negative – 23% Strongly Disagree, and 27% disagree. On the opposite opinion, only 32% - 25% Agree, and 7% Strongly Agree. At the same time, 18% can not decide. This result clearly states the employees` opinions and self-assessment of their work autonomy. The sense of freedom is a crucial element of any creative activity. Those employees who suffer from excessive control from their direct supervisors cannot perform at their best and reveal their true potential, mainly if the management aims to generate radically different solutions and proposals.

Statement 8: My organization has a variety of mechanisms in place for the exchange of ideas, including formal and informal ones. Results indicate that 60% of responders agree with the statement (32% - Agree and 28% - Strongly Agree). The share of disagreement here is 28% (12% - Strongly Disagree and 16% - Disagree). We observe a relatively low share of uncertainty here – 12%. This result proves that the central part of the organization has built a culture of sharing and is accepted by the employees.

Statement 9: The organizational structure supports the creativity of the employees. In contrast to the responses to the previous statement, here, most responders react negatively – 48% in total (in which 23% Strongly Disagree and 25% - Disagree). On the opposite opinion are only 26% (16% Agree and 10% Strongly Agree), while the share of hesitant here is 26%. Several reasons could explain this result. Firstly, the organizational structure is usually the top management's priority, and employees are primarily expected to be familiar with and comply with it. Therefore, it is logical that one part of the respondents do not have an opinion on this – this issue is not on their agenda at all; they have not thought about it before. Secondly, almost half of the respondents admit that the organizational structure is not convenient for employees' creativity, which is central to the overall efficiency level. More importantly, the organizational structure, by default, has to support the usual staff activities. If this staff does not feel such support, then the management has to initiate changes in this line.

Statement 10: The organization's top management clearly supports and encourages creativity in the workplace. Here, the share of hesitant people is the largest for the entire questionnaire section (38%). At the same time, disagreement with the statement is expressed by 20% of respondents (9 – Strongly Disagree and 11 - Disagree), while on the opposite side are 42% (30% Agree and 12% - Strongly Agree). The definiteness of the statement itself could explain this impressive number of people who are unsure in their response. Terms like "clearly supports" and "any kind of creativity" could be considered restrictive or confusing for responders.

Finally, the questionnaire contains three identically questions – we asked responders to assess the level of their creativity, the team creativity they work in and the level of organizational creativity, using the same evaluation scale – from 1 to 10, where 1 is the lowest level of creativity, and 10 is the highest level of creativity. Results are graphically presented in Fig. 7.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

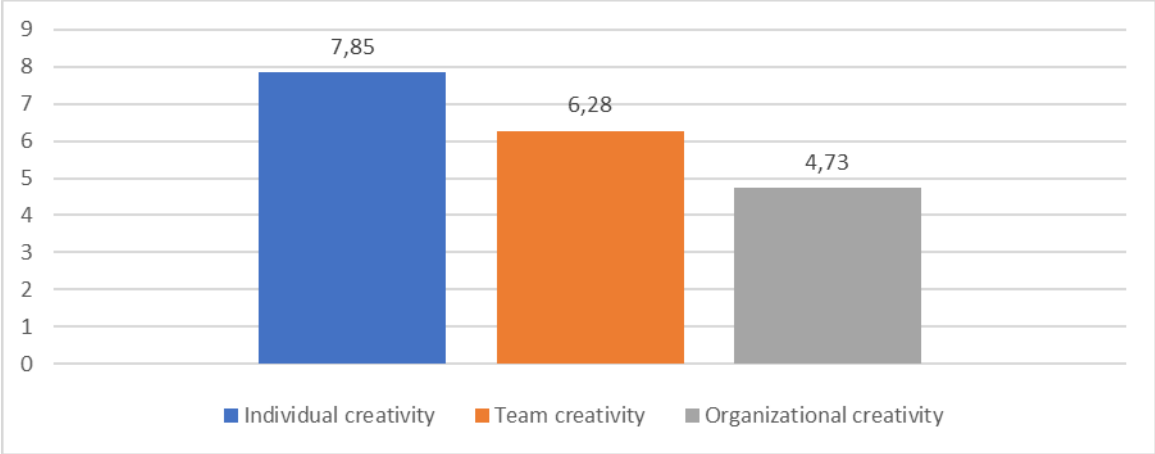


Fig. 7. Assessment of the different types of creativity (average score, scale from 1 to 10)

As can be seen from the figure above, the highest average score is achieved by Individual creativity (7,85), followed by Team creativity (6,28). In contrast, Organizational creativity is evaluated below half of the scale – 4,73. These assessments are indicators for several essential considerations. Above all, according to employees, organizational creativity is rated much lower than individual and even team creativity. In most cases, this means that organizational management fails to reveal the real individual and even team creativity potential. Therefore, our first hypothesis is confirmed by the study results - that business organizations do not efficiently reveal the full potential of creativity of their staff and teams. Comparing to the assessment of the individual creativity, the organizational creativity recedes significantly. The synergy effect between team members does not happen on the desired level. This situation could be overcome through the parallel implementation of several strategic activities for the organization: better strategic planning and allocation of resources, providing the possibility for creative teams to have reasonable time to ensure quality performance of the assigned tasks; improved policy for defining strategic organizational goals, by involving as many employees as possible; better policy for creative team formation, securing entering different people with diverse vision and expertise; better relation between direct manager and employees – to know and understand their motivation, needs and personal objectives.

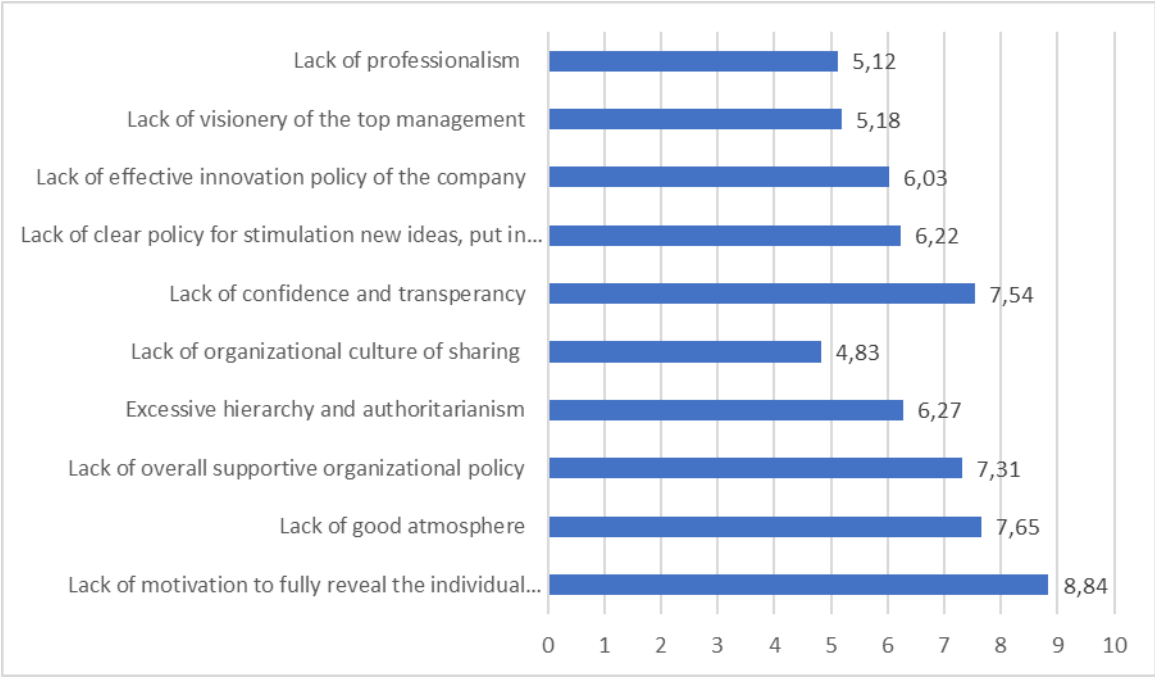


Fig. 8. Rate of barriers to work creativity (average score, scale from 1 to 10)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x8527586243

The last question of the study is devoted to the barriers that could affect the effectiveness of an employee's creative tasks in an organization. The responders were asked to rate each of the initially defined barriers on a scale from 1 to 10, where 1 is the lowest and 10 is the highest. The results are presented in Fig. 8.

The responders were asked to rate these barriers not in general but according to their current situation at work. As seen from Figure 10, the most important barrier is employees' lack of motivation to fully reveal their individual capacity (with an average score of 8,84). No other barrier exceeds a score of 8, which indicates the importance of motivation and the overall policy to motivate employees. With this finding our second hypothesis is also confirmed. At the same time, the top 5 barriers to work creativity are a lack of a good atmosphere, confidence and transparency, a lack of overall supportive organizational policy and Excessive hierarchy and authoritarianism.

5. Conclusion and recommendations

Organizational creativity is a crucial prerequisite for an effective company innovation policy. The overall innovation policy necessarily includes attracting creative employees to support the creation of new products and services. At the same time, attracting and employing creative employees is a first but insufficient condition for obtaining a good level of organizational creativity. To be effective, these creative experts must also be motivated, which requires much deeper attention and overall policy from the organization's management.

We studied the level of individual, team and organizational creativity among 384 employees representing 71 companies in all economic sectors. Our findings clearly state that there is a difference between levels of individual, team and organizational creativity at the company. Employees do not reveal their full creative potential; the main reason is the lack of proper motivation and organizational support. Other barriers to creativity are a lack of a good atmosphere, a lack of confidence and transparency, a lack of overall supportive organizational policy, excessive hierarchy, and authoritarianism. At the same time, employees tend to define themselves as creative, and organizational management must provide particular and comprehensive policies to improve organizational effectiveness in creativity.

References

Adeel, A., Sarminah, S., Jie, L., Kee, D. M. H., Daghriri, Y. Q., & Alghafes, R. A. (2023). When procrastination pays off: Role of knowledge sharing ability, autonomous motivation, and task involvement for employee creativity, *Heliyon*, 9(10), e19398. https://doi.org/10.1016/j.heliyon.2023.e19398.

Anguelov, K., Stoyanova, T., & Tamosiuniene, R. (2020). Research of motivation of employees in the IT sector in Bulgaria, *Entrepreneurship and Sustainability Issues*, 7(3), 2556–2567. https://doi.org/10.9770/jesi.2020.7.3(73)

Bousinakis, D., & Halkos, G. (2021). Creativity as the hidden development factor for organizations and employees, *Economic Analysis and Policy*, 71, 645-659. https://doi.org/10.1016/j.eap.2021.07.003.

Budiman, A., Rakhmawati, N.A., & Purwitasari, D. (2024). A Review of Creative Innovation Network and Creative Collaboration Process, *Procedia Computer Science*, 234, 622-627. https://doi.org/10.1016/j.procs.2024.03.047.

Cai, W., Fan, X., & Wang, Q. (2023). Linking visionary leadership to creativity at multiple levels: The role of goal-related processes, *Journal of Business Research*, 167, 114182. https://doi.org/10.1016/j.jbusres.2023.114182.

Carnevale, J. B., Huang, L., Vincent, L.C., Farmer, S., & Wang, L. (2021). Better to give than to receive (or seek) help? The interpersonal dynamics of maintaining a reputation for creativity, *Organizational Behavior and Human Decision Processes*, 167, 144-156. https://doi.org/10.1016/j.obhdp.2021.08.006.

Chen, W., Zhang, J., Xiao, Y., Wang, B., Gu, X., & Bai, Z. (2024). Benefit or cost? The "double-edged sword" effect of multiple team membership on creativity, *Journal of Innovation & Knowledge*, 9(2), 100485. https://doi.org/10.1016/j.jik.2024.100485

Cui, X., Yang, X., Ren, J., Lowry, P.B., & Du, T.Ch-t. (2024). Enhancing team creativity among information technology professionals through knowledge sharing and motivational rewards: A self-determination perspective, *Data and Information Management*, 100075. https://doi.org/10.1016/j.dim.2024.100075

El-Kassar, A.-N., Dagher, G. K., Lythreatis, S., & Azakir, M. (2022). Antecedents and consequences of knowledge hiding: The roles of HR practices, organizational support for creativity, creativity, innovative work behavior, and task performance, *Journal of Business Research*, 140, 1-10. https://doi.org/10.1016/j.jbusres.2021.11.079

Ellis, L.M. (2022). The interpersonal consequences of stealing ideas: Worse character judgments and less co-worker support for an idea (vs. money) thief, *Organizational Behavior and Human Decision Processes*, 171, 104165. https://doi.org/10.1016/j.obhdp.2022.104165

Di Prima, C., Cepel, M., Kotaskova, A., & Ferraris, A. (2024). Help me help you: How HR analytics forecasts foster organizational creativity, *Technological Forecasting and Social Change*, 206, 123540. https://doi.org/10.1016/j.techfore.2024.123540

Gao, Y., Zhao, X., Xu, X., & Ma, F. (2021). A study on the cross level transformation from individual creativity to organizational creativity, *Technological Forecasting and Social Change*, 171, 120958. https://doi.org/10.1016/j.techfore.2021.120958

Hanaysha, J. R. (2023). Impact of participative and authoritarian leadership on employee creativity: organizational citizenship behavior as a mediator, *International Journal of Organization Theory & Behaviour*, 26(3), 221-236. https://doi.org/10.1108/IJOTB-08-2022-0165

Hemonnet-Goujot, A., Ivens, B.S., & Pardo, C. (2022). Network creativity: A conceptual lens for inter- and intra-organizational creative processes, *Industrial Marketing Management*, 102, 503-513. https://doi.org/10.1016/j.indmarman.2022.02.002

Hoever, I. J., Betancourt, N.E., Chen, G., & Zhou, J. (2023), How others light the creative spark: Low power accentuates the benefits of diversity for individual inspiration and creativity, *Organizational Behavior and Human Decision Processes*, 176, 104248. https://doi.org/10.1016/j.obhdp.2023.104248.

Huang, X., Zhang, X., & Zhu, S. (2023). How showing others' ideas influences consumer creativity: The moderating role of participation motivation. *Thinking Skills and Creativity*, 49, 101338. https://doi.org/10.1016/j.tsc.2023.101338

Jaboob, M. (2023). Sustaining Employees' Creativity through the Organizational Justice: The Mediating Role of Leadership Styles, *World Development Sustainability*, 100115. https://doi.org/10.1016/j.wds.2023.100115

Lin, S.-Y., Hirst, G., Wu, C.-H., Lee, C., Wu, W., Chang, C.-C. (2023). When anything less than perfect isn't good enough: How parental and supervisor perfectionistic expectations determine fear of failure and employee creativity, *Journal of Business Research*, 154, 113341. https://doi.org/10.1016/j.jbusres.2022.113341

Marozzo, V., Crupi, A., Abbate, T., Cesaroni, F., & Corvello, V. (2024). The impact of watching science fiction on the creativity of individuals: The role of STEM background, *Technovation*, 132, 102994. https://doi.org/10.1016/j.technovation.2024.102994

Mihova, T., Ivanova, I., & Angelov, K. (2022). Impact of HRM activities digitization on the competitiveness of industrial enterprises, *AIP Conference Proceedings* 2449, 070002 https://doi.org/10.1063/5.0090974

Nguyen, P. N.-D., Mai, K. N., & Le, T.-H. (2023). Strategic perspectives, creativity, and financial performance in Vietnamese SMEs, *Heliyon*, 9(9), e20354. https://doi.org/10.1016/j.heliyon.2023.e20354

Nikolova, N. (2023). Human capital in the changing work environment of Industry 4.0,14th International Scientific and Practical Conference' ENVIRONMENT. TECHNOLOGY. RESOURCES, June 17-18, 2023, Rezekne Academy of Technologies, Rezekne, Latvia,Volume I, ISSN 1691-5402 Print, ISSN 2256-070X.

Paliwal, M., Rajak, B. K., Kumar, V., & Singh, S. (2022). Assessing the role of creativity and motivation to measure entrepreneurial education and entrepreneurial intention, *International Journal of Educational Management*, 36(5), 854-874. https://doi.org/10.1108/IJEM-05-2021-0178.

Popov, G., Anguelov, K., & Popova, A. (2021). Efficiency of the Management of Parallel Activities in the Business Enterprise, *AIP Conference Proceedings*, 2333. https://doi.org/10.1063/5.0041744

Puccio, G., & Schwartz, M. (2023). Chapter 4 - Outcomes of creativity in organizations: From organization to human-centered benefits, Editor(s): Roni Reiter-Palmon, Sam Hunter, *Handbook of Organizational Creativity* (Second Edition), Academic Press, 37-50. https://doi.org/10.1016/B978-0-323-91840-4.00004-9.

Rumanti, A.A., Rizana, A.F., & Achmad, F. (2023). Exploring the role of organizational creativity and open innovation in enhancing SMEs performance, *Journal of Open Innovation: Technology, Market, and Complexity*, 9(2), 100045. https://doi.org/10.1016/j.joitmc.2023.100045.

She, Z., Ma, L., Quan, L., & Jiang, P. (2024). Help or hindrance? The effects of leader workaholism on employee creativity, *Journal of Business Research*, 182, 114767. https://doi.org/10.1016/j.jbusres.2024.114767

Talat, A., Khan, S. N., Chaudary, S., & Neale, N.R. (2023). Investigating ICT for team creativity: A team sensemaking perspective, *IIMB Management Review*, 35(1), 15-25. https://doi.org/10.1016/j.iimb.2023.03.004

Wu, X., & Zhang, Y. (2023). Impact of workplace fun in a co-working space on office workers' creativity, *Journal of Organizational Change Management*, 37(1), 173-191. https://doi.org/10.1108/JOCM-04-2023-0102

Xu, S., Yaacob, Z., & Cao, D. (2024). How transformational leadership promotes employee creativity within the context of environmental dynamism: a multilevel perspective, *International Journal of Organization Theory & Behaviour*, 27(2), 101-119. https://doi.org/10.1108/IJOTB-06-2023-0117

Yang, F., Zhou, Z., & Yang, J. (2024). Lighting the fire of wisdom following humor: How and when leader humor yields team creativity through team knowledge integration capability, *Journal of Business Research*, Volume 183, 114834, ISSN 0148-2963, https://doi.org/10.1016/j.jbusres.2024.114834.

Yang, F. R., & Chen, C.-H.V. (2023). Having fun! The role of workplace fun in enhancing employees' creative behaviors in Chinese work settings, *Heliyon*, 9(3), e14597. https://doi.org/10.1016/j.heliyon.2023.e14597.

Zhu, L.Y., Bauman, C.W., & Young, M.J. (2023). Unlocking creative potential: Reappraising emotional events facilitates creativity for conventional thinkers, *Organizational Behavior and Human Decision Processes*, 174, 104209. https://doi.org/10.1016/j.obhdp.2022.104209

Funding: The present article is prepared in implementation of the project BG05M20P001-2.016-C01 entitled "The Economic education in Bulgaria", financed by the Operational Programme Science and Education for Intelligent Growth, funded by European Union through the European Structural and Investment Funds.

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request.

Miglena ANGELOVA is an Assoc. Professor Ph.D. in the Department of Management, University of National and World Economy, Sofia, Bulgaria. Research interests: Creative Business Management, Change Management, Strategic Management, IT Management, HR Management
ORCID ID: https://orcid.org/0000-0002-4460-133X

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

Publisher
http://jssidoi.org/esc/home

ASSESSMENT OF INVESTMENT RETURNS THROUGH THE PRISM OF INVESTMENT STRATEGIES: COMPARISON OF PERFORMANCE OF THE MOST SUCCESSFUL INVESTORS AND THE SLOVENIAN FUNDS

Ema Peternel [1], Vladimir Bukvič [2]

[1] University of Ljubljana, Faculty of Economics, Ljubljana, Slovenia,
[2] GEA College Faculty of Entrepreneurship, Ljubljana, Slovenia

E-mails:[1] ema.peternel@gmail.com; [2] vladimir.bukvic.ce@gmail.com

Received 11 June 2024; accepted 28 September 2024; published 30 December 2024

Abstract. In this paper, the authors analyze the investment philosophies and strategies of three financial mogul companies to find out what strategies they apply, yielding high returns. They also analyze their performance compared to Slovenian mutual funds and the broader stock market. The authors focus on some key research hypotheses. First, they are interested in assessing and monitoring the company's future intrinsic value, which refers to a fundamental, objective value contained in a financial asset. If the market price is below this value, this financial asset may be a good buy, or if it is above, it may be a good sale. While studying the investment strategies, they check if such an assessment enables above-average investment returns. Second, the authors state that the fund's profitability and risk reflect the chosen investment strategy. Investors generally expect higher returns from riskier investments. Risk tolerance is one of the critical factors determining the return on investment. Typically, higher-risk investments have the potential for higher returns, but they also come with a greater risk of loss. The authors compare and test how the risk is embedded in the investment strategies of three renowned financial investors and Slovenia mutual funds. Third, the authors hypothesised that time and patience are among the most critical factors in investing. The authors' fourth research hypothesis relates to the question if the stock market always accurately reflect the value of individual companies. Many researchers today argue that some market participants behave irrationally, what leads to market inefficiency. They suggest that the financial market can never be perfectly efficient. In the theoretical part of the paper, the authors begin with a brief literature overview underlying how different factors affect investment returns, especially focusing on the indicator ROI. Further, they shortly represent the investment strategies of Buffett, Ackman, and Palihapitiya. In the empirical part of the paper, they perform some financial calculations — annual return, average annual return, annual standard deviation, Sharpe ratio, and then proceed with a Monte Carlo simulation and a CAPM model. The author's findings show that a deep understanding and accurate assessment of a company's intrinsic value leads to above-average returns. The risk and return of a fund are tied to the strategy chosen, with those willing to accept a higher risk often achieving higher returns. They underline the importance of time and patience in investing and observe that the stock market does not always reflect the exact value of an individual company accurately, which emphasizes the importance of critical judgement and not blindly following market trends.

Keywords: influential investors; market efficiency; stock market; intrinsic value; company valuation

Reference to this paper should be made as follows: Peternel, E., Bukvič, V. 2024. Assessment of investment returns through the prism of investment strategies: comparison of performance of the most successful investors and the Slovenian funds. *Entrepreneurship and Sustainability Issues*, 12(2), 31-52. http://doi.org/10.9770/e4338524934

JEL Classifications: G14

1. Introduction

The process of making investment decisions entails a cognitive assessment that involves choosing one alternative from a range of options based on available information. Given the highly competitive global business

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

environment, investors are compelled to thoroughly study and develop their intuition to make informed investment choices.

The efficient market hypothesis states that stocks are always traded on stock exchanges at their fair value, which means that investors cannot buy undervalued stocks or sell them at inflated prices. Although the hypothesis establishes the foundation of modern financial theory, it is highly controversial. Proponents of the hypothesis argue that it is pointless to look for undervalued stocks or try to predict market trends through fundamental or technical analysis. The hypothesis states that without insider information, no one can generate risk-adjusted excess returns consistently enough. Thus, it seems that the only real approach to achieving higher returns is to invest in riskier investments (Downey, 2023). Despite this, financial moguls like Warren Buffett, Bill Ackman and Chamath Palihapitiya consistently manage to achieve returns that exceed the market average. We wonder what the secret of their success is.

The aim of the paper is to study and present the investment philosophies and methods of three globally recognized investors — Warren Buffett, Bill Ackman and Chamath Palihapitiya. We examine their philosophies and approaches to investing to better understand what is behind their success. Theoretical concepts are supported by empirical data and case studies. As part of the research, we conducted three case studies that were not included in the article due to their limited scope (Buffett, 2013; Canadian Pacific, 2012; Greenslade, 2014; Sheetz, 2021; USSEC, 2019; Dinner, 2023; Virgin Galactic, 2019, 2022a, 2022b, 2023). The following investments were discussed: Buffett's investment in The Washington Post, Ackman's investment in The Canadian Pacific Railway, and Palihapitiya's investment in Virgin Galactic. These case studies were key to understanding the decision-making processes behind each investment made. A more detailed discussion of the studies is available in the author's thesis (Peternel, 2023). In the research, we conducted a comparative analysis, comparing the financial indicators of Berkshire Hathaway and Pershing Square with the returns of the S&P 500 index and the selected Slovenian mutual funds. On the basis of a financial analysis, we prepared the calculations necessary for the comparative analysis. We obtained the data from the Yahoo Finance and Slovenian mutual funds databases. An important part of this paper is the Monte Carlo simulation, which enables the modelling of potential returns from continuous annual investments in Pershing Square, Berkshire Hathaway, the S&P 500 index and the selected Slovenian mutual funds. Using the CAPM model, we estimated the expected returns of Pershing Square, Berkshire Hathaway, the selected Slovenian mutual funds and the S&P 500 index in terms of their systematic risk, expected market return and risk-free rate of return.

With this paper, we want to determine whether and to what extent the principles and philosophies of the selected investors influence their investment decisions, whether the selected mutual funds exceed the return of the S&P 500 index and, if so, we aim to analyze the factors that contributed to their higher return, how the investment strategies are reflected in the profitability and risk of the fund, what is the profitability of the selected American funds compared to the selected Slovenian funds and, last but not least, what influence do knowledge and tracking of the intrinsic value of the company have on the final investment profitability.

2. Theoretical Background

The terms "investments" and "investing," which can be found in almost all economic sectors and, of course, also in the field of social activities, are closely related to the preservation, reduction or expansion of consumption. Investment plays a major role in the expansion of both personal and social consumption and in the increase or decrease in the economic growth of any national economy (Bukvič, 2023).

Investment refers to the act of allocating capital with the expectation of generating a rate of return in the future. Besides looking to increase the wealth of the shareholders, which mainly falls within the frame of the value-based management theory (Bukvič, 2016), investors have to consider some other aspects which are also becoming very relevant and deal with social responsibility. This implies a so-called impact investing, which is defined as the deployment of funds into investments that generate a measurable and beneficial social or environmental impact alongside a financial return on investment. An innovative way of boosting the private sector's contribution to sustainable development can be achieved with impact investing.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

The purpose of investing is to direct current financial resources into various forms of real or financial assets to achieve expected returns in the future. Here, we collide with the concept of uncertainty. The longer the period to which the investment relates, the greater the uncertainty regarding the generation of future returns. It accordingly follows that time and uncertainty are extremely important investment dimensions. We make an investment decision today and reap its results (the expected returns) in the future. If the investment decision is not considered enough, the future consequences can be very painful for the investor, even fatal (failed investments as a result of wrong investment decisions). Therefore, when making investment decisions, information that can help form a vision about the certainty of the investment's status in the future is very important.

Serious investors, i.e. companies in the real sector of the economy, various organizations in the field of social activities, individuals, "venture" capitalists (blue angels), and financial institutions such as banks, funds, etc., undertake investments in a prudent manner. This means, among other things, that they try to check and evaluate the economic benefits of their planned investments before making investment decisions. For this purpose, they use a wide variety of investment criteria, giving preference to those that also consider the temporal aspect. The most widespread among dynamic investment criteria is net present value.

The other one is return on investment, ROI. It can be confused with the profits of an investment. The key distinction between profits and ROI is that ROI is concerned with the money investors invest and the investment returns they receive based on the business's net profit. Profit is a metric used to assess a company's performance (Quanloop team, 2024).

Most investors will be looking for investments with the highest ROI, even though they should consider other factors, like dispersion of ROI and adjusting it with time. The ROI is a tool used to calculate the rates of return on money invested to determine whether or not to invest. Measuring ROI allows investors to assess the performance of different assets in an investment portfolio. A high ROI means that their returns are higher than the cost of the investment. A lower ROI would mean the opposite. Several factors influence ROI and cause its fluctuations. As the simplest form of returns measurement in percentage, ROI aids in the selection of various investment possibilities. As an investment grows, so does the importance of its ROI. The investors track their ROI and compare the return patterns. Positive or negative ROI will help investors determine whether to hold onto that investment or adjust it to the market.

In this context, we study the investment strategies of three globally recognized investors, i.e. Warren Buffett, Bil Ackman and Chamatha Palihapitiya, and compare their investment returns to Index S&P 500 and some Slovenian mutual funds.

1.1 Warren Buffett's Investment Strategy

In order to effectively manage Berkshire Hathaway and its investments, Buffett wrote twelve principles in a 2013 letter to the company's shareholders, which are classified into four main groups: 1. Business principles, 2. Management principles, 3. Financial principles and 4. Market principles. In summary, the short-term performance of an investment does not mean that the portfolio managers are good or bad. The period in which we measure the ability to generate returns is simply too short to draw any meaningful conclusions. However, if we look at the company's operating results, we can assess progress when the share price deviates from expected returns. Buffett emphasizes that the key to a successful investment is a competitive advantage and a favourable price compared to the internal value (margin of safety) (Klarman, 1999; Buffett, 1985; Buffett, 2014; Hagstrom, 2014).

1.2 Bill Ackman's Investment Strategy

Bill Ackman is a hedge fund manager and investor known for his use of activist investing (Dallas, Bainbridge and Bohinc, 2001). Ackman's activist investment approach is based on acquiring large stakes in undervalued companies through his hedge fund Pershing Square Capital Management. It works with the management of these companies to drive change that can increase shareholder value. Changes can be reflected in operational

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

improvements, reallocation of capital, or in the restructuring of the management team. Ackman often expresses his opinion publicly. He prepares presentations or writes open letters to the company's stakeholders in which he explains his investment strategy (Tenorio, 2021).

1.3 Chamatha Palihapitiya's Investment Strategy

Chamath Palihapitiya focuses on investing in high-tech companies with high growth and transformation potential. He looks for opportunities in undervalued companies with long-term competitive advantages. His strategy focuses on making unconventional decisions that deviate from market trends, thorough data analysis, and trust in management with a proven ability to lead and make decisions effectively. He believes in the power of technology to solve social problems and promotes companies that have a positive impact on society. He supports ethical behaviour, transparency and socially responsible investing. Issues of diversity, equality and inclusion are also of critical significance. As the co-founder of Facebook, he promotes a form of capitalism where success is measured not only by profit but also by social impact (Dure, 2023).

1.4. Differences in Strategies

The main differences between the selected investors' strategies lie in risk tolerance, time horizon, and level of involvement with the companies they invest in. Buffett is highly conservative, focusing on long-term investments with minimal risk. He is a passive investor and takes a "buy and hold" approach. Conversely, Ackman is more moderate in terms of risk but highly tactical. He often accelerates turnarounds through active engagement and driving corporate changes. Out of the three Palihapitiya takes on the riskiest investments, primarily focusing on tech-centric start-ups with high growth potential. Like Ackman, he is involved in the companies he invests in, focusing on shaping them for long-term growth.

1.5. Literature Review: How Different Factors Affect Investment Returns

In traditional finance, investors are assumed to behave rationally while making financial decisions. In contrast, proponents of behavioural finance argue that investors are not always rational. The financial decisions they make and their investment performance are influenced by various behavioural factors. So, the literature is filled with a plethora of studies on finding the impact of behavioural factors on decision-making and investment performance. A group of researchers (Uzma et al., 2024) tried to determine whether psychological, market, social, and financial literacy impact investment performance while testing the mediating role of decision-making. Interestingly, the results of their study are persistent with the prospect theory and assert that investors do not always make rational judgments when making financial investments.

Mutswenje (2009) confirmed that there seems to be a certain degree of correlation between the factors that behavioural finance theory and previous empirical evidence identify as the average equity investor. He found out that the most important factors that influence individual investment decisions were the reputation of the firm, the firm's status in the industry, expected corporate earnings, profit and condition of statement, past performance of firm stock, price per share, feeling on the economy and expected divided by investors.

Media can also be an influential factor affecting investment returns. The rapidly increasing scientific research on the stock market and the visible impact of media on equity prices are in the limelight. To a greater extent, causal analysis can reckon the sentimental effect of the broadcasted content on stock valuation. Renju and Biju (2023) carried out a study that perfectly identifies the deluge of information during quick leaps, and it is regarded as a beneficial formulation for investors when evaluating stocks with fewer news mentions. Their study also infers an explicit information flow and direction of causality between news sentiment and stock price movement, which can be used to devise future investment and consumption strategies.

The findings of the analysis carried out by Mulyadi, Zulkifli and Widyastuti (2023) reveal that financial literacy have negative effect on investment decisions. Conversely, financial behaviour, risk reception, and overconfidence have positive effects on investment decisions. Additionally, risk perception have positive effect on organizational performance. However, financial literacy, financial behaviour, overconfidence, and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

investment decisions have no effect on organizational performance. Consequently, it can be inferred that all factors influencing investment decisions have the capacity to influence organizational performance.

Relating to impact investing, Jeffers, Lyu and Posenau (2024) provided an analysis of the risk exposure and consequent risk-adjusted performance of impact investing funds, private market funds with dual financial and social goals. Adding a public sustainability factor to their pricing model helps explain the impact of fund returns. However, the correlation of impact fund cash flows with the public sustainability factor on its own is not necessarily positive.

Return on Investment (ROI) is the most crucial aspect of choosing between a good investment strategy and a bad one. Earning great ROI returns is the ultimate goal of stock market investment. There are several factors determining the return on investment of an asset class or a fund. Bhatia (2023) introduced the top ten factors that contribute to the success of an investment strategy: investment type, time horizon, risk tolerance, market conditions, diversification, investment costs, economic conditions, taxation, monitoring and rebalancing and performance evaluation. Let us expose only the last one. According to Bhatia, keeping track of how the investments are performing is vital for making informed decisions. Investors should assess their investments based on their historical performance, market conditions, and their financial goals. If an investment consistently underperforms or no longer aligns with the objectives, it may be time to consider selling or reallocating those assets. Effective performance evaluation allows investors to make adjustments that can positively impact the factors determining the return on investment.

For the purpose of our research, where we are trying to assess the investment returns through the prism of investment strategies of the most successful investors, we are focusing on the following factors.

Market Conditions, Intrinsic Value and Market Efficiency

Market conditions are dynamic and have a direct impact on the factors determining the return on investment. Economic factors, geopolitical events, and market sentiment all influence the performance of investments (Bhatia, 2023). For example, most investments tend to perform well during a bull market, leading to higher ROIs. On the other hand, during a bear market or economic recession, investments may struggle, resulting in lower returns. Awareness of current market conditions and adjusting the investment strategy accordingly is essential for optimizing ROI.

Intrinsic value refers to a fundamental, objective value contained in an object, asset, or financial contract. It may be a good buy if the market price is below this value or a good sale if it's above it. There are several methods for arriving at a fair assessment of a share's intrinsic value. Intrinsic value is fundamental for value investing, a strategy established by Benjamin Graham and popularized by Warren Buffett. Scholars emphasize that the stock market does not always reflect a company's true value (Hagstrom, 1999; Greenblatt, 2010). The efficient market hypothesis (EMH) states that securities markets are highly efficient in reflecting all available information about individual stocks as well as about the stock market as a whole (Fama, 1970). However, the accuracy of EMH is difficult to test. Many authors today argue that, while some market participants behave irrationally – leading to market inefficiencies - such pricing irregularities are present in the short term. They suggest that the market can never be perfectly efficient as there would be no incentive to uncover new information, which is then reflected in market prices (Malkiel, 2003).

The recent underperformance of value investing strategies in equity markets has sparked debate about their continued relevance. Several criticisms of value investing have been raised, such as increased share repurchasing, monetary policy changes, oversimplified value measures and the rise of intangible assets, which makes it harder to assess a company's value using traditional accounting. A recent study evaluated these criticisms but found little empirical evidence to support them (Israel, Laursen and Richardson, 2020). Existing literature, however, lacks studies on how modern strategies, such as Bill Ackman's activist investing or Chamath Palihapitiya's tech-driven strategy, evaluate intrinsic value in fast-moving industries.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

Returns and Risk of Investments: The Eternal Dilemma of Investors

Risk and return are inherently linked, as supported by the modern portfolio theory (Markowitz, 1952) and the Capital Asset Pricing Model (CAPM) (Lintner, 1965; Sharpe, 1964). Investors generally expect higher returns from riskier investments. According to Bhatia (2023), risk tolerance is one of the critical factors determining the return on investment. It defines investors' ability and willingness to endure the ups and downs of the investment market. Generally, higher-risk investments have the potential for higher returns, but they also come with a greater risk of loss. Investors with a high-risk tolerance may opt for aggressive growth strategies, such as investing in emerging markets or startups. Conversely, investors with a low-risk tolerance may prefer more conservative options like bonds or real estate. It's important to align their risk tolerance with their investment choices, as it plays a significant role in determining the return on investment.

The risk is not the same for all investors. Different investors take different risks. We are talking about risk appetite. Risk appetite is the degree of broad-based risk that an investor is willing to accept in pursuit of their strategic goals. Risk appetite reflects the risk management philosophy an investor wants to adopt and consequently influences their risk culture, way of operating and decision-making (The Global Fund, 2018). Regarding a low-risk investment, the return is generally low as well. Similarly, high risk brings with it the possibility of high losses. Therefore, investors should diversify their portfolios. Diversification of investments has a statistical effect in terms of reducing overall risk. Investors, especially beginners, are often advised to diversify their portfolio (Bukvič, 2024). Both Ackman's and Palihapitiya's investment strategies align with this approach, as they take on moderate to high-risk investments with the expectation of high returns. While much of the literature covers traditional risk-return frameworks, less attention is given to the fundamentals of a business. Models such as CAPM and the beta coefficient focus too heavily on market prices, failing to consider specific business fundamentals or broader economic developments. One could argue that risk is less about market price volatility and more about an investor's understanding of the underlying business and its long-term potential.

Macroeconomic Factors

Stock markets are greatly affected by macroeconomic conditions. Economic indicators, such as inflation rates, interest rates, and GDP growth, are vital in determining the return on investment. These indicators can affect the value of the investments, the cost of borrowing, etc. For example, high inflation rates can erode investors' money's purchasing power, making it essential to invest in assets that outpace inflation. On the other hand, low interest rates can make borrowing cheaper, potentially boosting the return on investment for leveraged strategies. As Bhatia (2023) says, staying informed about economic indicators is essential for making informed investment decisions. Many studies have investigated the link between macroeconomic variables and stock market volatility (Fama, 1990; Binswanger, 2000; Ozlen and Ergun, 2012). Certain unfavourable macroeconomic conditions, such as slow growth combined with rising inflation, high volatility or illiquidity, make it difficult for assets to generate long-term returns. Different asset classes respond differently to these factors. For example, stocks tend to do well during periods of growth, while bonds may perform better during economic downturns (Ilmanen, Maloney, and Ross, 2014). Extreme situations, such as the COVID-19 pandemic, can have serious negative impacts on stock market returns. A 2022 study on the global stock markets during COVID-19 found a decrease in mean returns and an increase in volatility (Chowdhury, Khan and Dhar, 2022). Existing literature lacks focus on how specific strategies, like Ackman's activist investing, perform under different macroeconomic conditions.

Interest Rates

Monetary policy, specifically through interest rate changes, influences the returns on financial assets, affecting their prices. This, in turn, impacts economic decisions and growth. Bernanke and Reinhart (2004) argue that low interest rates, whether current or expected, encourage investments as borrowing money becomes cheaper. Some research, however, suggests that this relationship is small and mostly dependent on inflation rates (Sellin, 2001). A more recent Johansen cointegration analysis showed a long-term equilibrium relationship between stock prices, inflation rates, and real interest rates. The study found that changes in real interest rates and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

inflation rates Granger cause significant changes in stock prices. It concluded that real interest rates are positively associated with stock prices, as higher interest rates often indicate stronger economic conditions. Inflation rates, however, are negatively associated with stock prices. The analysis also showed a significant speed of adjustment between stock prices and real interest rates, meaning that when there is a deviation from the long-term equilibrium, the stock prices will adjust relatively quickly (Eldomiaty, Saeed, Hammam and AboulSoud, 2020).

Regulation

Hahn and Hird (1991) were the first to provide a comprehensive analysis of the costs and benefits of federal economic and social regulation. Since then the macroeconomic effects of regulation have been widely studied (Goff, 1996; Dawson and Seater, 2013). Regulations help maintain market safety and stability and protect consumers, but often at the cost of lower profits for businesses. Regulation imposes a significant cost on firms (Ince and Ozsoylev, 2024). Businesses also face regulatory risk, which refers to the potential changes in laws, regulations, or government policies that could adversely affect a company's operations or profitability. This is particularly relevant for investors like Palihapitiya, who focuses on high-growth and emerging sectors like technology and space travel, where regulatory shifts can significantly impact a company's long-term prospects.

Taxation

Taxes can have a significant impact on investors' ROI. How investments are taxed can vary depending on factors like investors' location and the type of investment. Understanding the tax implications of the investments is crucial to maximizing the after-tax return on investment. For example, long-term capital gains are often taxed at a lower rate than short-term gains. Additionally, certain investments, like municipal bonds, may offer tax-free interest income. Bhatia (2023) asserts that by strategically managing investors' tax liabilities, they can improve the factors determining the return on investment. Understanding how the investments are taxed is critical to ROI fluctuations. The government taxes all incomes, and investment income is no exception. Taxes also depend on the country since both income tax and capital gains tax may be lower in those countries, and in some countries, there may be no capital gains taxes. Some countries will give tax breaks on investments to boost investors' portfolios. Once the investors know the real rate of taxes and any tax benefits, they can decide where to allocate their investments to maximise their ROIs.

2. Research Methodology

With our research, we set the following research hypotheses:
H1: Proper assessment and monitoring of the company's future intrinsic value enables above-average investment returns.
H2: The fund's profitability and risk are a reflection of the chosen investment strategy. Investment funds that are willing to take on more risk often aim for higher returns, while more conservative funds aim for lower but more stable returns.
H3: The most important factors in investing are time and patience.
H4: The stock market does not always accurately reflect the value of an individual company, so it is important to critically evaluate every decision and not blindly follow market trends.

In the theoretical part of the research, we used the scientific method of description as well as the scientific methods of classification, comparison, analysis and synthesis.

In the empirical part of the research, we used statistical methods (arithmetic mean, standard deviation) and analyzed the data using the Sharpe ratio, performed a Monte Carlo simulation and used the CAPM model.

For the research, we used secondary data from the Yahoo Finance database and the Slovenian mutual investment funds databases. The research covers the 2018–2022 period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

3. Results and Discussion

3.1 The return on Shares of Two Companies Listed on Global Stock Exchanges

Let's see how a hypothetical $10,000 investment in Berkshire Hathaway (BRK-A) stock would have grown over the past five years (2018-2022). The calculated values are shown in Table 1.

Table 1. Stock prices, returns and value of a hypothetical $10,000 investment in Berkshire Hathaway stock over the period 2018-2022

Year	Stock price in January (in $)	Stock price in December (in $)	Annual return (in %)	Final value of the investment (in $)
2018	295,755	306,000	3.46	10,346.00
2019	304,057	339,590	11.68	11,554.41
2020	342,261	347,815	1.62	11,741.59
2021	343,525	450,662	31.18	15,402.62
2022	454,300	468,711	3.17	15,890.89

Source: Yahoo Finance (2023a).

Based on the calculations, we find that the investment of $10,000 in Berkshire Hathaway stock would grow to about $15,890 in the period between 2018 and 2022. The investment would grow by 59% in five years. Figure 1 shows Berkshire Hathaway's annualized return and the movement of a hypothetical $10,000 investment in Berkshire Hathaway stock over the 2018–2022 period.

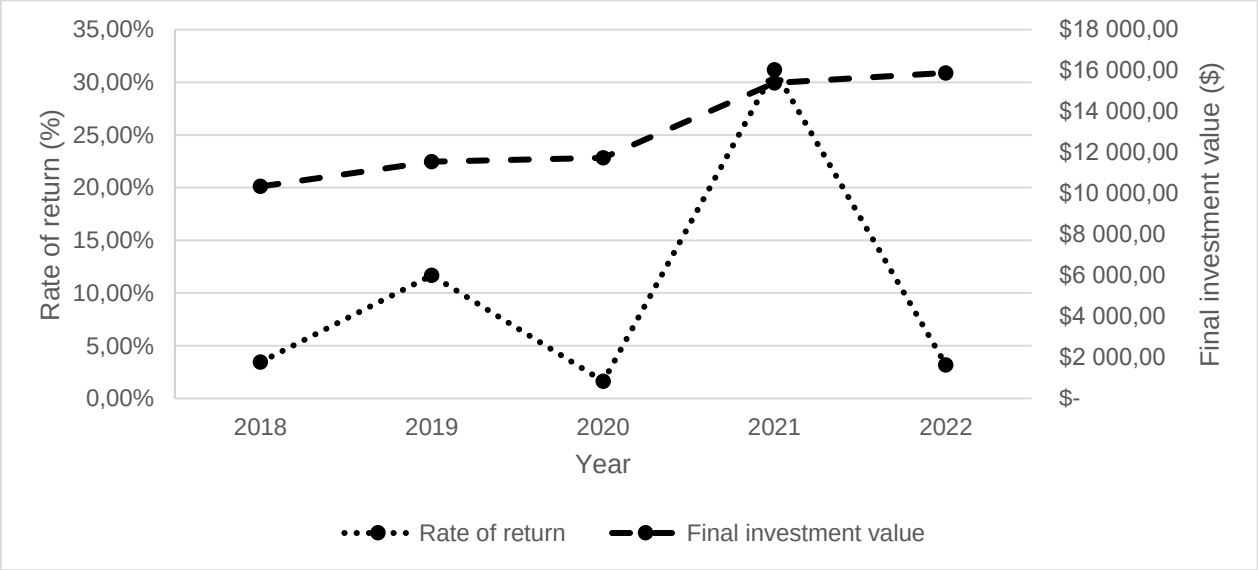


Figure 1. Graphic representation of Berkshire Hathaway's annualized return and the performance of a hypothetical $10,000 investment in Berkshire Hathaway's stock over the 2018–2022 period.
Source: Yahoo Finance (2023a).

Let's see how a hypothetical $10,000 investment in Pershing Square Holdings Ltd. (PSH.AS) stock would have developed in the last five years (2018–2022). The calculated values are shown in Table 2.

Table 2. Stock prices, returns and value of a hypothetical $10,000 investment in Pershing Square stock over the 2018–2022 period.

Year	Stock price in January (in $)	Stock price in December (in $)	Annual return (in %)	Final value of the investment (in $)
2018	12.84	12.04	–6.23	9,377.00
2019	12.04	18.24	51.50	14,206.00
2020	18.57	33.89	82.50	25,926.00
2021	34.28	40.23	17.36	30,427.00
2022	39.44	34.35	–12.91	26,500.00

Source: Yahoo Finance (2023b).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

A $10,000 investment in Pershing Square stock would increase to about $26,500 from 2018 to 2022, a 165% increase. Despite two years of negative returns, the analysis showed a long-term growth trend. Short-term losses do not reflect long-term trends, as high returns in other years more than offset these losses. Although the path has been unpredictable, the company's long-term strategy is successful in uncertain market conditions. Figure 2 shows Pershing Square's annualized stock return and the performance of a hypothetical $10,000 investment in Pershing Square stock over the 2018–2022 period.

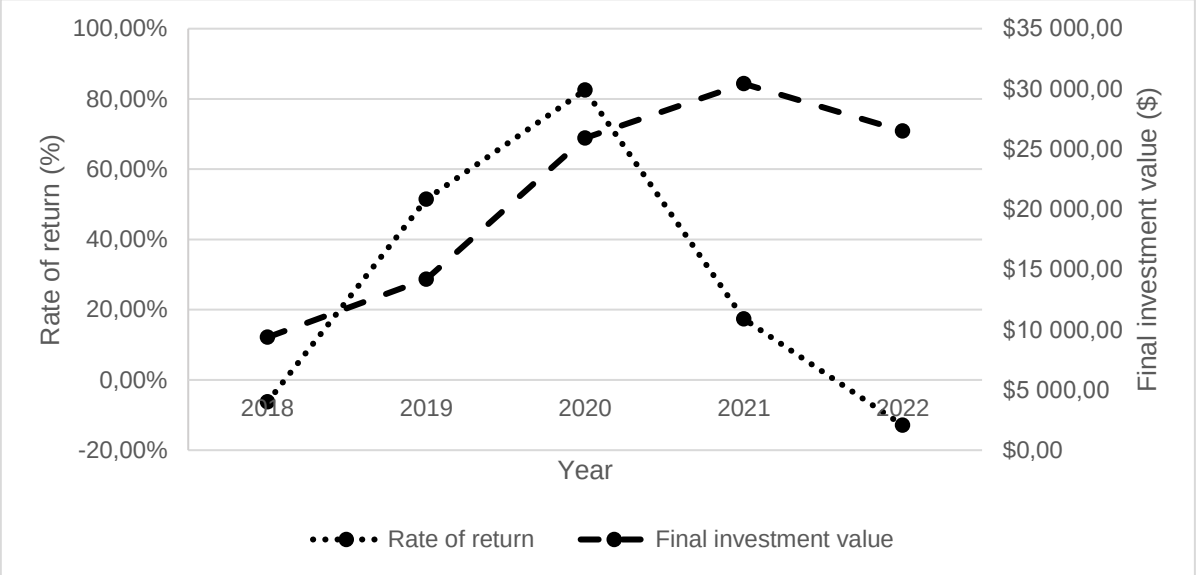


Figure 2. Graphical representation of Pershing Square's annualized stock return and the performance of a hypothetical $10,000 investment in Pershing Square stock over the 2018–2022 period.
Source: Yahoo Finance (2023b).

An analysis of Berkshire Hathaway and Pershing Square's stock returns in the 2018–2022 period highlights the importance of a long-term strategy and patience, which are key for investors. Despite short-term fluctuations and negative returns in some years, high positive returns in other years led to overall investment growth. Pershing Square's stock stood out for its outstanding returns, which more than offset short-term losses. These fluctuations show that the stock market does not always reflect the true value of companies, which requires critical judgment from investors.

b. Average return on shares of selected companies, mutual funds and the S&P 500 index
The average return is an indicator that is calculated as the geometric mean of the annual returns in the studied period; it takes into account the effect of compound interest (Thakur, 2023).

We calculate annual returns for the following stocks of companies and mutual funds: Pershing Square, Berkshire Hathaway, NLB Razvita Evropa Delniški (NLB Equity Advanced Europe), NLB Globalni Delniški (NLB Equity Global), TRIGLAV Severna Amerika (TRIGLAV North America), TRIGLAV Evropa (TRIGLAV Europe) and the S&P 500 index.

Among the selected companies and mutual funds, the shares of *Pershing Square (PSH.AS)* achieved by far the highest average annual return during the five-year period under review – 21.74%. Compared to the S&P 500 index, this return is truly impressive. A higher return often comes with a higher risk, which we will explore in greater detail below.

Berkshire Hathaway (BRK-A) returns were 9.65% on average over the past five years, outperforming the S&P 500. However, BRK-A lagged Pershing Square by a significant margin. The underperformance of shares (BRK-A) can be attributed to Berkshire Hathaway's long-term and conservative strategy, which focuses on stable companies with strong business models. Such an approach is reflected in market-beating stock prices with

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

relatively little risk for investors. This strategy may mean lower short-term returns but aims for long-term stability and growth.

The NLB Razvita Evropa Delniški mutual fund, which focuses on investments in established European companies and is managed by NLB Skladi (NLB Funds), recorded an average annual return of its unit of property of only 2.40% in the period under review. This return is much lower both in comparison to the shares of Pershing Square and Berkshire Hathaway and even to the average return of the S&P 500 index. This allows us to draw conclusions that the investment strategy of the mutual fund is less successful. However, a lower return does not necessarily mean that a mutual fund or this specific investment is a poor choice for investors. Its long-term profitability is highly dependent on the performance of the European economy. In the following subsection, we will take a closer look at its stability and the size of the risk it assumes.

The NLB Globalni Delniški mutual fund, managed by NLB Skladi, achieved an average annual return per unit of 5.07% in the five years under review. The annual return is much better than the return of the NLB Razvita Evropa Delniški mutual fund, but it still does not reach the return of the S&P 500 index. According to the information on their website, the mutual fund is intended for investors who want to invest in a well-diversified global stock portfolio, as it is highly diversified. Although the return of the NLB Globalni Delniški mutual fund is lower than the return of the S&P 500 index, its geographical and sector diversification can be attractive to investors (NLB Skladi, 2023a).

TRIGLAV Severna Amerika, a mutual fund managed by Triglav Skladi (Triglav Funds), achieved an average annual return of 8.96%, which exceeds the return of the S&P 500 index but still lags behind the return on shares of Berkshire Hathaway and Pershing Square. The Triglav Skladi website describes the mutual fund as high-risk, so it is important to look at how effectively it creates value relative to the accepted risk (Triglav Skladi, 2023b).

The TRIGLAV Evropa mutual fund, managed by Triglav Skladi, achieved the lowest average annual return per unit of all the mutual funds and company shares discussed, namely only 1.36%. TRIGLAV Evropa is a mutual fund that focuses on investments in European companies. However, it seems that the regional focus did not bring the desired results in the period under review. Possible reasons for such a low return could include a weaker economic performance in Europe or a failed investment strategy of the mutual fund. In addition, this mutual fund is considered high-risk, so the low returns are surprising (Triglav Skladi, 2023a).

The S&P 500 index achieved an average annual return of 7.33% during the period under review. Investing in funds that track the S&P 500 index is often considered less risky than investing in individual stocks because the index consists of 500 different companies, allowing for greater diversification. However, it is important to emphasize that diversification in itself does not eliminate all investment risks. The S&P 500 index is one of the most commonly used criteria for assessing investment returns and is accepted as a good indicator of the overall performance of the market, so in this part, it will serve as a basis for comparing the performance of the discussed mutual funds and companies.

Table 3 shows the average returns on shares of selected companies, unit values of mutual funds and the S&P500 index over the last five-year period.

Table 3. Overview of the average annual return of selected mutual funds, company shares and the S&P 500 index in the 2018–2022 period.

Stock, fund, index	**Average annual return** (in %)
PSH.AS (Pershing Square)	21.74
BRK-A (Berkshire Hathaway)	9.65
NLB Razvita Evropa Delniški	2.40
NLB Globalni Delniški	5.07
TRIGLAV Severna Amerika	8.96
TRIGLAV Evropa	1.36
S&P 500	7.33

Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c, 2023f, 2023g).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

Figure 3 shows a comparison of the average annual return of selected mutual funds, company shares and the S&P 500 index for the last five-year period.

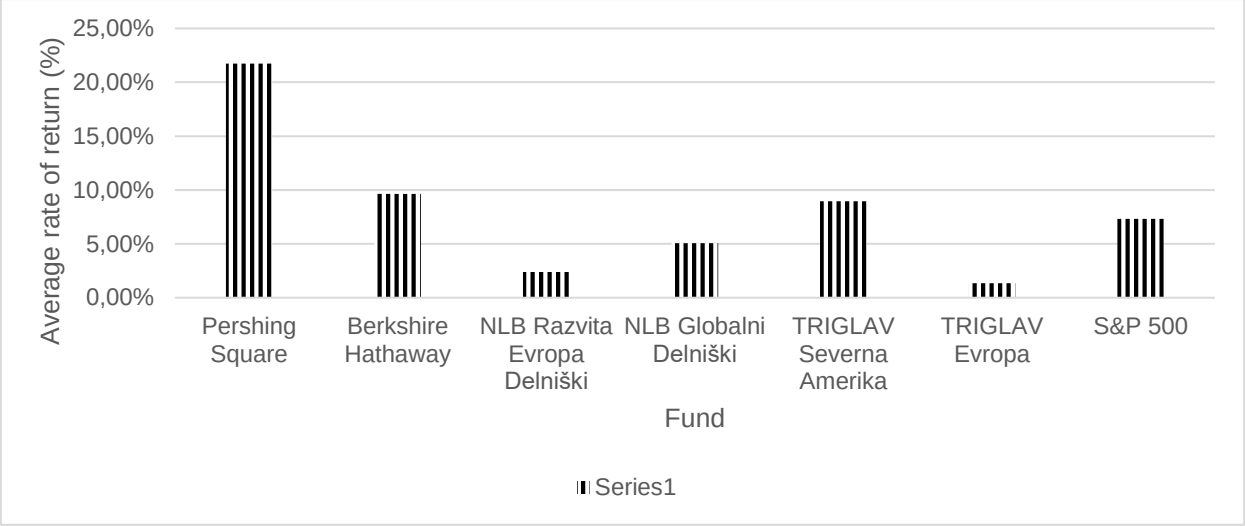


Figure 3. Graphic representation of the average annual return on shares of selected companies, mutual funds and the S&P 500 index in the 2018–2022 period.
Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c).

The quantitative analysis of the average return on selected mutual funds and shares of the selected companies in the 2018–2022 period reveals ¸complex dynamics that affect the return. Various factors such as investment strategy, geographic focus and accepted risk co-shape returns. Some companies have chosen long-term strategies, which have reflected in stable returns, while others have chosen a more aggressive approach, which has brought higher returns but also higher risk. The geographical focus also affected the returns, as differences in economic conditions and market trends across regions created opportunities and challenges for fund managers. Higher risk has often brought higher returns, but also higher volatility, which was evident in Pershing Square's exceptionally strong stock returns.

3.2 The Risk of Investments by Joint-Stock Companies on Global Stock Exchanges and Slovenian Mutual Funds

In the investment world, there is no return without risk. Risk represents the uncertainty about future returns on an investment and is an essential part of understanding and evaluating investments. In this subsection, we focus on a tool often used in financial analyses to measure this risk: the annual standard deviation.

The annual standard deviation measures the dispersion of a data set relative to the mean value of the data. The greater the standard deviation of the securities, the greater the variance between each price and the mean, indicating a greater price range (Hargrave, 2023).

The standard deviation for the S&P 500 index in the 2018–2022 period was 0.219. This value reflects the dispersion of annual returns around the mean, with a higher value indicating greater volatility and a lower value indicating more stable returns. In our case, the annual returns of the S&P 500 index are, on average, in a range of about 21.9%, around the average annual return.

The standard deviation for the *Pershing Square's stock* in the 2018–2022 period was 0.275, which means that the stock's returns moved with a volatility of about 27.5% around its average annual return. The company's stock has performed highly fluctuating annual returns during the period under review, ranging between 82.5% in 2020 and -12.91% in 2022. Based on this, we can say that the investment in Pershing Square's stock is very

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

volatile, as on the one side it means a high probability of high returns, and on the other side a higher risk, i.e. a high probability of loss.

The standard deviation for the *Berkshire Hathaway* stock of was 0.224 during the period under review, which means that the returns of the stock moved with a volatility of about 22.4% around the average annual return. Since the standard deviation of Berkshire Hathaway's stock is only slightly above the standard deviation of the S&P 500, this indicates a relatively low-risk investment in the company. When you combine this with the fact that Berkshire Hathaway achieved higher returns than average returns in the capital market, and considering its relatively low risk, an investment in Berkshire Hathaway stock appears to be very attractive.

The standard deviation of the units of the *NLB Razvita Evropa Delniški* mutual fund was 0.180, which means that the returns of the mutual fund fluctuated with a volatility of approximately 18% around the average annual return during the period under review. Since this value is lower than the standard deviation of the S&P 500, it can be argued that the mutual fund was less volatile during this period. Lower volatility generally means lower risk as the value of the investment fluctuates less.

The units of the *NLB Globalni Delniški* mutual fund also had a lower annual standard deviation than the S&P 500 index. It was 0.173. This value reflects that the returns of the mutual fund fluctuated with a volatility of 17.3% around the average annual return during the period under review. Yields did not fluctuate excessively, which can be attractive to investors looking for more stable investments. Factoring in the mutual fund's low average yields (5.07%), investors would probably be more interested in an investment that tracks the S&P 500 index.

The *TRIGLAV Severna Amerika* mutual fund recorded a standard deviation of 0.223. This value reflects the volatility of the fund's return, which was approximately 22.3%, around the average annual return. The value is comparable to the standard deviation of the S&P 500, which had a standard deviation of 0.219, and Berkshire Hathaway, which had a standard deviation of 0.224. The mutual fund was very similar to the stock market in terms of volatility. In addition, it managed to realize a slightly higher average annual return (8.96%) than the S&P 500 index (7.33%), thus achieving better results than the stock market.

The standard deviation of the assets of the *TRIGLAV Evropa mutual fund* amounted to 0.172 in the period under review. This value reflects the volatility of the return of the mutual fund, which was approximately 17.2%, around the average annual return. The standard deviation of the mutual fund was lower than the standard deviation of the S&P 500. We can conclude that their returns were more stable and less volatile. The low average annual returns of the mutual fund (1.36%) only confirm the low volatility.

Table 4 shows the investment risks of selected shares of foreign companies and Slovenian mutual funds as well as the S&P 500 index in the considered five-year period.

Table 4. Overview of investment risks of selected Slovenian mutual funds, company shares and the S&P 500 index in the 2018–2022 period.

Stock, fund, index	Investment risk expressed in standard deviation
Pershing Square	0.275
Berkshire Hathaway	0.224
NLB Razvita Evropa Delniški	0.180
NLB Globalni Delniški	0.173
TRIGLAV Severna Amerika	0.223
TRIGLAV Evropa	0.172
S&P 500	0.219

Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c, 2023f, 2023g).

Figure 4 illustrates the investment risks of selected shares of foreign companies and Slovenian mutual funds in the period under consideration.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

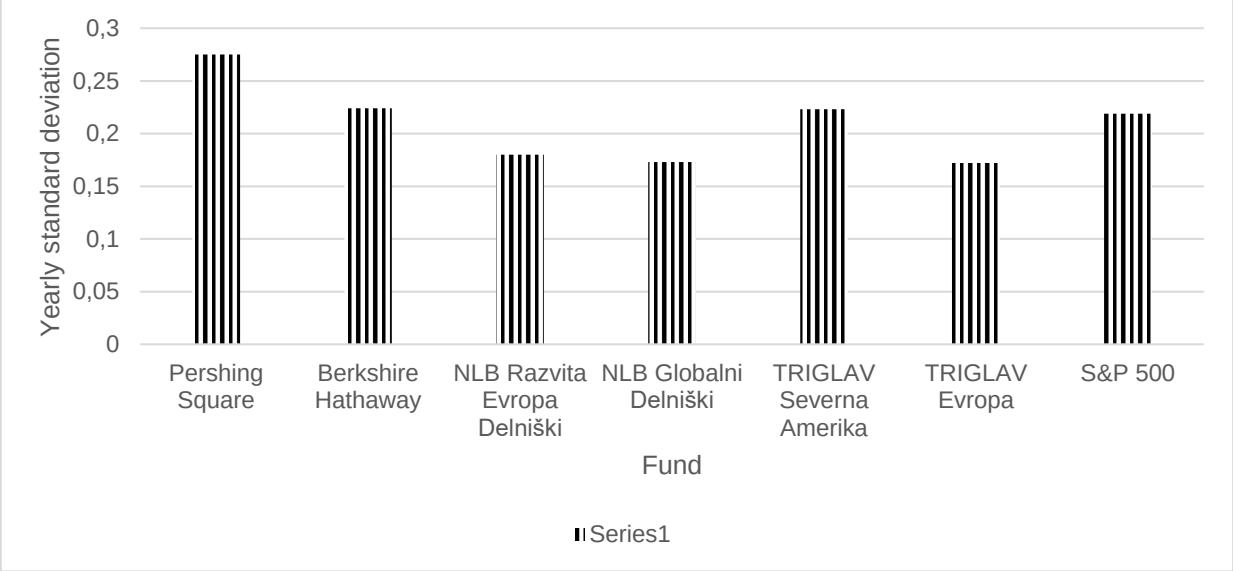


Figure 4. Graphic representation of investment risks of selected company shares, mutual funds and the S&P 500 index (2018-2022).
Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c).

The analysis of the standard deviation of the shares of the selected companies and the Slovenian mutual funds provided insight into their volatility and risks. The Pershing Square shares showed the highest volatility during the period reviewed, which reflects the high risk, but at the same time brings the potential for high returns, which was presented in detail in the previous two subsections. On the other hand, mutual funds NLB Razvita Evropa Delniški, NLB Globalni Delniški and TRIGLAV Evropa showed a lower standard deviation, which indicates lower risk with more stable returns. We can conclude that the return and risks of the fund and the company's shares are a reflection of its chosen investment strategy. While Pershing Square pursues a strategy focused on achieving high returns, which is reflected in its share price, mutual funds such as NLB Razvita Evropa Delniški, NLB Globalni Delniški and TRIGLAV Evropa chose a strategy that favours lower risk and more stable returns.

3.3 Profitability Compared to the Riskiness of Investments of Joint-Stock Companies on Global Stock Exchanges and Slovenian Mutual Funds

The Sharpe Ratio

The Sharpe ratio is a way of measuring the performance of an investment considering its risk. A higher ratio indicates an investment that provides higher risk-adjusted returns (Fernando, 2023).

For comparison, let's first look at the Sharpe ratio for companies within *the S&P 500 index*. The ratio was 0.24 during the period under review. For every unit of risk assumed, the S&P 500 gained 0.24 units of excess return above the risk-free interest rate. A higher Sharpe ratio means higher risk-adjusted returns, so in this case it can be argued that the S&P 500 performed relatively well compared to the risk taken.

The Sharpe ratio *for Pershing Square* stock was 0.71, which is much higher than the ratio achieved by the S&P 500. We can conclude that the stock has been better adjusted to risk, thus generating better results compared to the capital market. Investing in stocks managed to generate 0.71 units of excess return for every unit of risk assumed. Through analysis, we found that investing in Pershing Square shares has by far the highest average returns, is volatile and therefore riskier. The company's investment policy was riskier, but they managed to manage these risks perfectly, which allowed them to generate a large excess return. Investing in Pershing Square stock turned out to be an excellent choice for risk-averse investors in search of high returns.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

The Sharpe ratio for *Berkshire Hathaway* stock was 0.34. The stock generated 0.34 units of excess returns for every unit of risk assumed. Although the company's stock did not achieve as high a ratio as Pershing Square's stock, it managed to generate better returns relative to the risk taken compared to the capital market (S&P 500).

For the *NLB Razvita Evropa Delniški* mutual fund, the Sharpe ratio was barely 0.02 in the considered time period. This is significantly less than the Sharpe ratio for the S&P 500. This mutual fund generated meager risk-adjusted returns compared to other mutual funds and stocks of selected foreign companies. For every unit of risk that the mutual fund assumed, it generated only 0.02 unit of excess return. Considering the low average return, the mutual fund is not attractive for investors.

For the *NLB Globalni Delniški* mutual fund, the Sharpe ratio was 0.17. The same as mutual funds NLB Razvita Evropa Delniški and TRIGLAV Evropa, the NLB Globalni Delniški mutual fund generated lower risk-adjusted returns compared to the S&P 500 index. For each unit of assumed risk, the mutual fund generated 0.17 units of excess return above the risk-free interest rate. Being risk-adjusted, it has underperformed the S&P 500 index. Even considering the modest returns, the findings suggest that the NLB Globalni Delniški mutual fund is not the best choice for investors.

The *TRIGLAV Severna Amerika* mutual fund recorded a slightly better Sharpe ratio of 0.31. The mutual fund exceeded the ratio achieved by the S&P 500 index during the period under review. For each unit of risk, the mutual fund generated 0.31 units of excess return. The mutual fund managed to generate relatively good risk-adjusted returns, but it still lagged Pershing Square and Berkshire Hathaway in both the Sharpe ratio and the average return.

The *TRIGLAV Evropa* mutual fund created the worst Sharpe ratio of all mutual funds and companies, which amounted to –0.04. The mutual fund generated negative risk-adjusted returns during the period under review. The TRIGLAV Evropa mutual fund, therefore, generated lower returns than the risk-free rate of return (it is a systematic risk).

Table 5 shows the Sharpe ratio, which reflects the magnitude of risk and return for selected mutual funds, shares of selected companies and the S&P 500 index.

Table 5. Display of the Sharpe ratio for stocks of selected companies, mutual funds and the S&P 500 index in the 2018–2022 period.

Fund, stock, index	Sharpe ratio
Pershing Square	0.71
Berkshire Hathaway	0.34
NLB Razvita Evropa Delniški	0.02
NLB Globalni Delniški	0.17
TRIGLAV Severna Amerika	0.31
TRIGLAV Evropa	–0.04
S&P 500	0.24

Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c, 2023f, 2023g)

Figure 5 visualizes the Sharpe ratios as shown in Table 5 and represents the return-to-risk ratio for selected mutual funds and companies.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

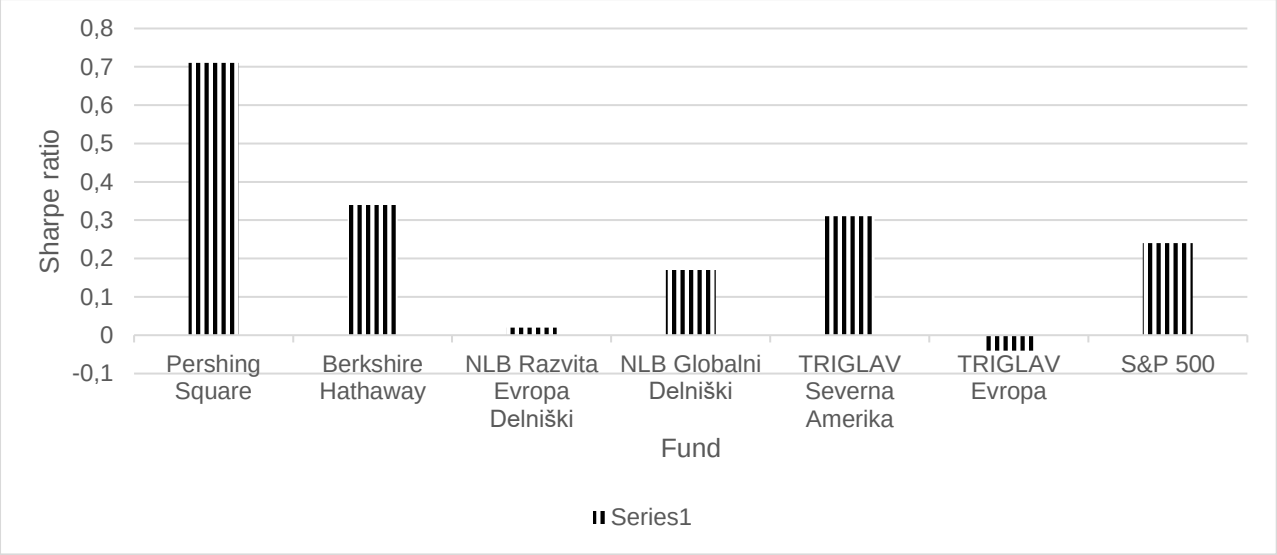


Figure 5. Display of the Sharpe ratio for stocks of selected companies, mutual funds and the S&P 500 index.
Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c).

In summary, the analysis of the Sharpe ratio for the stocks of the selected companies, mutual funds and the S&P 500 index offered a thorough insight into their return relative to the risk assumed. The differences in ratios showed a clear divide between individual investment strategies of mutual funds and companies. The shares of Pershing Square have been the best performers in terms of achieving risk-adjusted returns, while some mutual funds, such as TRIGLAV Evropa, have shown less favourable results. Different investment management strategies, from more dynamic to more conservative, reflect different risks and returns. From the perspective of an investor seeking the optimal combination of return and risk, this analysis helps identify potential opportunities and pitfalls within available investment options.

The Monte Carlo Simulation

A Monte Carlo simulation is based on random sampling to generate numerical results and to simulate the range of possible outcomes for an uncertain event. The Monte Carlo simulation results are not completely accurate. The results shown are only simulated and do not exactly represent the predicted results but serve as a tool to evaluate different possible scenarios. Also, a Monte Carlo simulation assumes constant returns, which is not the case in reality (Kenton, 2023).

In our example, we run a Monte Carlo simulation that considers an annual investment of $6,000 over a period of 40 years (2022–2062). With this input, we model a regular annual investment or payment into an investment or portfolio. In the simulation, we run 10,000 scenarios for each stock of the selected company and unit of the mutual fund in order to evaluate a wide range of potential outcomes. The Monte Carlo simulation results are shown in Table 6.

Table 6. Combined Monte Carlo simulation results for selected mutual funds, corporate stocks and the S&P 500 index in $.

Stock, fund, index / Percentile	5 %	25 %	75 %	95 %
PSH.AS	3,934,025	14,626,639	89,513,017	326,300,383
BRK-A	290,724	761,113	3,041,195	8,812,753
NLB Razvita Evropa Delniški	102,555	191,997	491,570	1,041,253
NLB Globalni Delniški	182,646	357,329	958,234	2,047,977
TRIGLAV Severna Amerika	250,877	644,925	2,578,724	7,260,077
TRIGLAV Evropa	92,492	162,139	385,506	766,662
Index S&P 500	183,454	441,362	1,650,003	4,384,542

Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c, 2023f, 2023g)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

The *PSH.AS stock* consistently shows high ranging from \$3,934,025 at the 5th percentile to a whopping \$326,300,383 at the 95th percentile. The *BRK-A stock* boasts values ranging from \$290,724 at the 5th percentile to \$8,812,753 at the 95th percentile. Widely recognized as a reflection of the overall health of the US stock market, the *S&P 500* provides values ranging from \$183,454 at the 5th percentile to \$4,384,542 at the 95th percentile. The *TRIGLAV Severna Amerika* mutual fund shows wide dispersion with final investment values between \$250,877 at the 5th percentile and \$7,260,077 at the 95th percentile.

On the other side of the spectrum are mutual funds such as *NLB Razvita Evropa Delniški*, *NLB Globalni Delniški* and *TRIGLAV Evropa*, which show a more stable and balanced final value of investments with smaller differences between values at the 5th and 95th percentile.

The Monte Carlo simulation revealed the dynamics of long-term investments in shares of the selected companies and mutual funds. Namely, those who chose to invest long-term reaped benefits regardless of short-term fluctuations. The long-term approach allowed the capital to develop and grow without exposing the investment to momentary market reactions. The simulation confirms that time and patience are essential factors in building a successful investment portfolio and reinforces the mindset that long-term investment patience often brings more stable and positive results.

The differences in the investment strategy are also perfectly visible. *Pershing Square's stock* showed high investment closing values. The company pursues a more aggressive strategy aimed at seeking high returns, often with greater risk. On the other hand, *Berkshire Hathaway*, known for its conservative strategy focusing on long-term value, showed lower but still high final investment values. Mutual funds *TRIGLAV Evropa*, *NLB Razvita Evropa Delniški* and NLB Globalni Delniški showed lower final investment values, which reflects a different approach to the investment strategy.

The CAPM Model

The CAPM model (capital asset pricing model) is an idealized representation of how financial markets value securities. They determine the expected returns on capital investments, taking into account the risk measured by the standard deviation. The CAPM model states that the riskier the stock is, the higher its expected return is (Marotta, 2012).

A stock's beta measures the movement of the value of a particular investment compared to the movement of the S&P 500 index (Marotta, 2012). Table 7 shows the results of the CAPM model.

Table 7. Display of Beta and CAPM values for selected mutual funds, company shares and the S&P 500 index.

Indicator	PSH.AS	BRK-A	NLB Razvita Evropa Delniški	NLB Globalni Delniški	TRIGLAV Severna Amerika	TRIGLAV Evropa
BETA(β)	0.9700	0.8700	0.6274	0.4631	0.3974	0.5437
CAPM	8.8 %	8.4 %	7.3 %	6.6 %	6.3 %	7 %

Source: NLB Skladi (2023b), Triglav Skladi (2023c), Yahoo Finance (2023c, 2023f).

The beta coefficient (β) for *Pershing Square (PSH.AS)* is 0.97. The return on this company's share moves in line with the return on the capital market, represented in our case by the S&P 500 index. The CAPM model shows the highest expected return among mutual funds and shares, a return of 8.8%.

The displayed expected return is far below the calculated average annual return on the company's stock, which was 21.74% over the last five years. The CAPM model takes into account systematic risk, which is measured by beta, but not non-systematic risk or specific characteristics of investments and their management (Kenton, 2023). The company's stock had a high average standard deviation (27.5%), which is not taken into account by the CAPM model. The exceptionally high average annual return over the past five years may therefore be the result of non-systematic risk and other factors. Consequently, the future return shown by the CAPM model for the PSH.AS share may not be the most realistic. Furthermore, the CAPM model assumes that financial markets

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

are perfectly rational and efficient and therefore all information is immediately and fully incorporated into investment prices (Kenton, 2023). Pershing Square exploits market irrationalities, including the irrational behaviour of other investors, delays in incorporating information into stock prices, and other forms of market inefficiency. Therefore, the CAPM model cannot accurately estimate the future profitability of the PSH.AS share, since the company operates exactly in the way, the CAPM model does not take into account.

The beta coefficient for *Berkshire Hathaway (BRK-A)* is 0.87. Therefore, the return on the share is slightly less sensitive to market movements than the S&P 500 index. According to the CAPM model, we can expect an annual return of 8.4%.

Similar to Pershing Square, Berkshire Hathaway also exploits market irrationalities. The CAPM model does not consider the specifics of Berkshire Hathaway's strategy, so the model cannot be completely reliable and may underestimate expected returns. Berkshire Hathaway's investment policy is also highly diversified. A high degree of diversification in some instances leads to a lower beta value of the company's stock, reducing the expected return on the stock according to the CAPM model (Kenton, 2023).

NLB Razvita Evropa Delniški – a mutual fund managed by NLB Skladi – invests mainly in developed Europe, with part of the assets also intended for developing European markets (NLB Skladi, 2023c).

The beta coefficient per unit of mutual fund assets is 0.63, which means that the mutual fund's performance is not that strongly related to the general movement of the market. Using the CAPM model, we can conclude that the expected return could be 7.3%.

NLB Globalni Delniški – a mutual fund managed by NLB Skladi – invests globally with a focus on developed markets but occasionally also includes investments in developing markets (NLB Skladi, 2023a).

The mutual fund's historical daily unit prices show a beta value of 0.46. The return of the mutual fund can, therefore, follow the market movement like the S&P 500 index. Based on the CAPM model, the expected return would be 6.6%.

TRIGLAV Severna Amerika – a mutual fund managed by Triglav Skladi – invests in the shares of the largest companies in North America (Triglav Skladi, 2023b).

The unit of mutual fund assets has a beta coefficient of 0.40. The return of the mutual fund follows the market movement less than the S&P 500 index. According to the CAPM model, a return of 6.3% could be expected.

TRIGLAV Evropa – a mutual fund managed by Triglav Skladi – invests in shares of established European companies (Triglav Skladi, 2023a).

The beta value of the asset unit is 0.54, which indicates that the return of the mutual fund is less sensitive to market movements than the S&P 500 index. According to the CAPM model, we can expect an annual return of 7%.

In conclusion of this subsection, we can write that the CAPM model is useful and effective for understanding risks and returns in the context of systematic market risk. However, its use is best in combination with other tools and analytical approaches that can better include the complexity and dynamics of individual investments. This subsection provides insight into the benefits and limitations of the CAPM model but is also important for understanding the big picture when evaluating investment opportunities.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

Conclusions

In the research, we examined in detail the investment strategies of three globally recognized successful investors, Warren Buffett, Bill Ackman and Chamath Palihapitiya, and compared them with the investment strategies of Slovenian mutual funds and the capital market. We tested four research hypotheses.

Research shows that the ability to monitor and assess a company's intrinsic value can lead to extraordinary returns. Using fundamental analysis, Buffett, Ackman, and Palihapitiya found undervalued companies, invested in them and made money by increasing their market value.

We confirm the first hypothesis *H1: Proper assessment and monitoring of the company's future intrinsic value enables above-average investment returns.*

The financial analysis confirmed the fact that the capital fund's profitability and risk are a reflection of its chosen strategy. It turned out that the ability of Pershing Square and Berkshire Hathaway to achieve above-average returns also partly stems from the acceptance of greater risks, which both companies managed by diversifying their investments. The NLB funds followed more conservative strategies, which is why they generated lower but more stable returns. The Sharpe ratio showed the importance of risk management. Pershing Square and Berkshire Hathaway can accept more risk because they know how to manage it better, while, for example, the NLB funds generate relatively low returns per unit of accepted risk. We confirm the second hypothesis *H2: The fund's profitability and risk are a reflection of its chosen investment strategy.* Funds willing to accept more risk often aim for higher returns, while more conservative funds focus on achieving more stable but lower returns.

Time and patience are extremely important in investing. All three investors are well aware that to achieve truly high returns, it is necessary to take a strategic, long-term view of investments. Such thinking is reflected in their approach of not simply buying stocks but seeing themselves as business owners. They focus on the long-term performance of the company rather than on the short-term market fluctuations, which can lead to more stable and potentially higher returns in the long run. They warn that a short-term view leads to extremely risky speculative investments, which confirms the third hypothesis *H3: The most important factors in investing are time and patience.*

In the financial world, opinions on the accuracy of stock market values remain divided. Some financial experts believe that markets always reflect all available information consistent with the efficient market hypothesis, which states that it is impossible to consistently generate above-average returns. Nevertheless, it should be noted that Buffett, Ackman and Palihapitiya, with their good understanding of individual companies and their excellent knowledge of how the stock market works, managed to identify investment opportunities well. Above-average returns were generated only after a few years until the market recognized the potential and value of these companies. We partially confirm the fourth hypothesis *H4: The stock market does not always reflect the real value of an individual company, so it is important to critically evaluate every decision and not blindly follow market trends.*

At this point, we should also mention the limitations we encountered during the research. These relate mainly to the empirical part. The first limitation stems from the non-random sample size. We limited the research to two large foreign joint-stock companies, whose shares are listed on world stock exchanges, and to a few Slovenian mutual funds. We did not include Slovenian joint-stock companies, such as the so-called blue chips, and we did not consider all Slovenian mutual funds, such as the Generali Investments mutual fund. The research could cover a longer period, e.g. a 10-year period. We also point out the limitation of access to complete information regarding the presented strategies and the possible bias in the interpretation of their performance. Additional limitations include the lack of quantitative analysis that could better quantify the effectiveness of the strategies, while time constraints prevent a full assessment of the long-term performance and sustainability of these strategies. We also emphasize that our analysis of returns and risks does not cover all relevant factors, such as macroeconomic, regulatory conditions and taxation. We must definitely take these limitations into account when interpreting the presented findings of our research.

It would be useful to include other well-known investors in future research. It would be interesting to include investors with different views and approaches to making their investment decisions and to examine how their strategies perform in different market conditions.

It would also make sense to analyze the reasons why Slovenian mutual funds do not achieve returns that would be closer to the returns of the investors that we present in this paper. The goal would be to determine whether there are specific market or regulatory factors that, with their limitations, affect the profitability of Slovenian mutual funds. The research could also include an analysis of investment approaches used by Slovenian mutual funds.

References

Bernanke, B.S., & Reinhart, V.R. (2004). Conducting monetary policy at very low short-term interest rates. *American Economic Review*, 94(2), 85-90. https://doi.org/10.1257/0002828041302118

Binswanger, M. (2000). Stock market booms and real economic activity: Is this time different? *International Review of Economics & Finance*, 9(4), 387-415. https://doi.org/10.1016/S1059-0560(99)00056-8

Bhatia, H. (2022). Top ten Essential Factors Determining the Return on Investment. Sustvest (formerly SolarGridX), Gurugram, Haryana, India.

Buffett, W.E. (1985). Berkshire Hathaway Inc. https://www.berkshirehathaway.com/letters/1984.html

Buffett, W.E. (2013). Berkshire Hathaway Inc. https://www.berkshirehathaway.com/letters/2012ltr.pdf

Buffett, W.E. (2014). Shareholder Letter. https://www.berkshirehathaway.com/letters/2013ltr.pdf

Bukvič, V. (2016). Value based management with some practical examples in Slovenian industries. *Advances in Business Related Scientific Research Journal*, 7(2), 40-79

Bukvič, V. (2024). Strateške investicije v luči njihove dinamike in financiranja: primer slovenskih podjetij v obdobju 2010 do 2017 = Strategic investments in the light of their dynamisc and finanancing: an exsample of Slovenian companies in the period from 2010 to 2017. Poslovodno računovodstvo. [Spletna izd.], 17(1), 153-218.

Canadian Pacific. (2012). Canadian Pacific Annual Report 2011. https://s21.q4cdn.com/736796105/files/doc_financials/Annual-Report/2011/cp-ar-2011.pdf

Chowdhury, E.K., Khan, I.I., & Dhar, B.K. (2022). Catastrophic impact of Covid-19 on the global stock markets and economic activities. *Business and Society Review*, 127(2), 437-460. https://doi.org/10.1111/basr.12219

Dallas, L.L., Bainbridge, S.M. in Bohinc, R. (2001). Direktorski odbor in delničarski aktivizem v ZDA in Sloveniji. Ljubljana: Fakulteta za družbene vede.

Dawson, J.W., & Seater, J.J. (2013). Federal regulation and aggregate economic growth. *Journal of Economic Growth*, 18, 137-177. https://doi.org/10.1007/s10887-013-9088-y

Dinner, J. (2023). Who is Virgin Galactic and what do they do? https://www.space.com/18993-virgin-galactic.html

Downey, L. (2023). Efficient Market Hypothesis (EMH): Definition and Critique. https://www.investopedia.com/terms/e/efficientmarkethypothesis.asp

Dure, E. (2023). Chamath Palihapitiya: Early Life, Education, Personal Life. https://www.investopedia.com/who-is-chamath-palihapitiya-5105271

Eldomiaty, T., Saeed, Y., Hammam, R., & AboulSoud, S. (2020). The associations between stock prices, inflation rates, interest rates are still persistent: Empirical evidence from stock duration model. *Journal of Economics, Finance and Administrative Science*, 25(49), 149-161. https://doi.org/10.1108/JEFAS-10-2018-0105

Fama, E.F. (1970). Efficient capital markets. *Journal of Finance*, 25(2), 383-417. https://doi.org/10.2307/2325486

Fama, E. F. (1990). Stock returns, expected returns, and real activity. *The Journal of Finance*, 45(4), 1089-1108. https://doi.org/10.1111/j.1540-6261.1990.tb02428.x

Fernando, J. (2023). Sharpe Ratio: Definition, Formula, and Examples. Acquired from https://www.investopedia.com/terms/s/sharperatio.asp

Goff, B. L. (1996). Regulation and macroeconomic performance. Science & Business Media. https://doi.org/10.1007/978-1-4613-1343-4

Greenblatt, J. (2010). The Little Book That Still Beats the Market. New Yersey: John Wiley & Sons.

Greenslade, R. (2014). Warren Buffett says farewell to the Washington Post in £737m sell-off deal. https://www.theguardian.com/media/greenslade/2014/mar/13/washington-postwarrenbuffett#:~:text=9%20years%20old,Warren%20Buffett%20says%20farewell%20to%20the%20Washington,%C2%A3737m%20sell%2Doff%20deal&text=Warren%20Buffett%20is%20to%20end,Holdings%2C%20the%20

Hagstrom, R.G. (1999). The Warren Buffett Portfolio: Mastering the Power of the Focus Investment Strategy. New Jersey: John Wiley & Sons.

Hagstrom, R.G. (2014). The Warren Buffett Way (3rd ed.). New Jersey: John Wiley & Sons.

Hahn, R. W., & Hird, J. A. (1991). The costs and benefits of regulation: Review and synthesis. Yale J. on Reg., 8, 233.

Hargrave, M. (2023). Standard Deviation Formula and Uses vs. Variance. https://www.investopedia.com/terms/s/standarddeviation.asp

Ilmanen, A., Maloney, T., & Ross, A. (2014). Exploring Macroeconomic Sensitivities: How Investments Respond to Different Economic Environments. *The Journal of Portfolio Management*, 40(3), 87-99. https://doi.org/10.3905/jpm.2014.40.3.087

Ince, B., & Ozsoylev, H. (2024). Price of Regulations: Regulatory Costs and the Cross-section of Stock Returns. *The Review of Asset Pricing Studies*, 14(3), 381-427, https://doi.org/10.1093/rapstu/raae001

Israel, R., Laursen, K., & Richardson, S. A. (2020). Is (systematic) value investing dead? Journal of Portfolio Management. https://doi.org/10.3905/jpm.2020.1.194

Jeffers, J., Lyu, T., & Posenau, K. (2024). The Risk and Return of Impact Investing Funds. *Journal of Financial Economics*, 161. https://doi.org/10.1016/j.jfineco.2024.103928

Kenton, W. (2023). Capital Asset Pricing Model (CAPM) and Assumptions Explained. https://www.investopedia.com/terms/c/capm.asp

Klarman, S.A. (1999). Why Value Investors Are Different. https://www.barrons.com/articles/SB918877044971819500

Litner, J. (1965). Security Price, Risk, and Maximal Gains from Diversification. *Journal of Finance*, 20(4), 587-615. https://doi.org/10.1111/j.1540-6261.1965.tb02930.x

Malkiel, B.G. (2003). The efficient market hypothesis and its critics. *Journal of Economic Perspectives*, 17(1), 59-82. https://doi.org/10.1257/089533003321164958

Markowitz, H. (1952). Portfolio selection. *The Journal of Finance*, 12(7), 77-91. https://doi.org/10.1111/j.1540-6261.1952.tb01525.x

Marotta, D. J. (2012). CAPM: The First Factor of Investing. https://seekingalpha.com/article/444721-capm-the-first-factor-of-investing

Mulyadi, M., Zulkifli, Z., & Widyastuti, T. (2023). Analysis of Factors Affecting Investment Decisions and its Implications on Organizational Performance. *Interdisciplinary Journal and Hummanity (INJURITY)*, 2(9), 784-794. https://doi.org/10.58631/injurity.v2i9.111

Mutswenje, V.S. (2009). A survey of the factors influencing investment decisions: the case of individual investors at the NSE. Thesis. University of Nairobi. http://erepository.uonbi.ac.ke:8080/xmlui/handle/123456789/13223

NLB Skladi. (2023a). NLB Skladi: Globalni delniški. https://www.nlbskladi.si/skladi/podskladi/globalni-delniski#investira-nalozba_delnice

NLB Skladi. (2023b). Podskladi krovnega sklada NLB Skladi. https://www.nlbskladi.si/skladi/podskladi

NLB Skladi. (2023c). Razvita Evropa delniški. https://www.nlbskladi.si/skladi/podskladi/razvita-evropa-delniski

Özlen, S., & Ergun, U. (2012). Macroeconomic factors and stock returns. *International Journal of Academic Research in Business and Social Sciences*, 2(9), 315.

Peternel, E. (2023). Naložbene strategije nekaterih najuspešnejših vlagateljev svetovnih borz in primerjava njihove donosnosti s slovenskimi skladi [Diplomsko delo, E. Peternel]. Repozitorij samostojnih visokošolskih in višješolskih izobraževalnih organizacij. https://revis.openscience.si/IzpisGradiva.php?lang=slv&id=9948

Quanloop Team (2021). Three main factors may cause ROI to fluctuate and what you can do to stabilise it.

Renju, R.V., & Biju, R.M. (2023). Study of the sentimental influence on Indian stock price. *Heliyon*, 9(12). https://doi.org/10.1016/j.heliyon.2023.e22788

Sellin, P. (2001). Monetary policy and the stock market: theory and empirical evidence. *Journal of Economic Surveys*, 15(4), 491-541. https://doi.org/10.1111/1467-6419.00147

Sharpe, W. F. (1964). Capital asset prices: A theory of market equilibrium under conditions of risk. *The Journal of Finance*, 19(3), 425-442. https://doi.org/10.1111/j.1540-6261.1964.tb02865.x

Sheetz, M. (2021). Virgin Galactic drops 10% after chairman Chamath Palihapitiya dumps his $213 million personal stake. Acquired from https://www.cnbc.com/2021/03/05/chamath-palihapitiya-sells-virgin-galactic-spce-stake.html

Tenorio, E.M. (2021). Bill Ackman's biography: What is his investment style? Acquired from https://www.bbva.ch/en/news/bill-ackmans-biography-what-is-his-investment-style/

Thakur, M. (2023). Annual Return Formula. Acquired from https://www.educba.com/annual-return-formula/

The Global Fund (2018). Risk Appetite Framework. Board Approved GP/B39/DP11.

Triglav Skladi. (2023a). Triglav Evropa. https://www.triglavskladi.si/poskrbite-za-svoje-premozenje/nalozbeni-skladi/triglav-evropa/

Triglav Skladi. (2023b). Triglav Severna Amerika. https://www.triglavskladi.si/poskrbite-za-svoje-premozenje/nalozbeni-skladi/triglav-severna-amerika/.

Triglav Skladi. (2023c). Vzajemni skladi in naložbene kombinacije. https://www.triglavskladi.si/poskrbite-za-svoje-premozenje/nalozbeni-skladi/

United States Securities and Exchange Commission (USSEC). (2019). Form 10-K: Annual report pursuant to section 13 or 15(d) of the securities and exchange act of 1934: general instructions. https://www.sec.gov/files/form10-k.pdf

Uzma, B., Fiaz, A.S., Naveed ul. H., & Bilal, A. (2024). Impact of allied factors on investment performance, mediating role of investment decision: evidence from investors in Lahore. School of Accounting & Finance, University of Lahore https://www.researchgate.net/publication/377159189

Virgin Galactic. (2019). Virgin Galactic completes merger with Social Capital Hedosophia, creating the world's first and only publicly traded commercial human spaceflight company. Acquired from https://investors.virgingalactic.com/news/news-details/2019/Virgin-Galactic-Completes-Merger-with-Social-Capital-Hedosophia-Creating-the-Worlds-First-and-Only-Publicly-Traded-Commercial-Human-Spaceflight-Company/default.aspx

Virgin Galactic. (2022a). Virgin Galactic announces board changes. Acquired from https://investors.virgingalactic.com/news/news-details/2022/Virgin-Galactic-Announces-BoardChanges/default.aspx

Virgin Galactic. (2022b). Virgin Galactic Holdings Inc. (SPCE) Q4 2021 – earnings call transcript. https://news.alphastreet.com/virgin-galactic-holdings-inc-spce-q4-2021-earnings-call-transcript/

Virgin Galactic. (2023). Virgin Galactic announces first quarter 2023 financial results and provides business update. https://investors.virgingalactic.com/news/news-details/2023/Virgin-Galactic-Announces-First-Quarter-2023-Financial-Results-And-Provides-Business-Update/default.aspx

Yahoo Finance. (2023a). Berkshire Hathaway Inc. (BRK-A). https://finance.yahoo.com/quote/BRK-A?p=BRK-A

Yahoo Finance. (2023b). Pershing Square Holdings, Ltd. (PSH.AS). https://finance.yahoo.com/quote/PSH.AS?p=PSH.AS&.tsrc=fin-srch

Yahoo Finance. (2023c). SPDR S&P 500 ETF Trust (SPY). https://finance.yahoo.com/quote/SPY?p=SPY&.tsrc=fin-srch

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e4338524934

Author Contributions: The authors contributed equally. All authors have read and agreed to the published version of the manuscript.

Ema PETERNEL
ORCID ID: https://orcid.org/0009-0004-0447-2221

Vladimir BUKVIČ
ORCID ID: https://orcid.org/0000-0003-1330-9720

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

Publisher
http://jssidoi.org/esc/home

DO TOP BUSINESS SCHOOLS CONSIDER ENTREPRENEURSHIP AS A CORE VALUE?

Shabir Ahmad [1], Ishtiaq Bajwa [2], Faisal Aftab [3], Chaudhry Kashif Mahmood [4], Kamran Siddiqui [5*]

[1,2] Al Yamamah University, Al Khobar, Kingdom of Saudi Arabia
[3,4,5] Imam Abdulrahman Bin Faisal University, Dammam, Kingdom of Saudi Arabia*

E-mails:[1] S_Ahmad@yu.edu.sa; [2] I_Bajwa@yu.edu.sa;
[3] faaftab@iau.edu.sa; [4]ckmahmood@iau.edu.sa; [5]KASiddiqui@iau.edu.sa (Corresponding Author)*

Received 15 May 2024; accepted 8 October 2024; published 30 December 2024

Abstract. Core values have gained paramount importance in all facets of business circles and have broader applications in higher education institutions. This research endeavours to examine and classify the core values practised at the world's top 100 business schools (BS). The population included BS that officially published core values and appeared in any two BS rankings in the last three years. The core values were extracted from their official websites. Content analysis was used as the major data analysis technique. This research provides many significant findings. Firstly, 87% of top BS in our sample have identified 3 to 6 core values. Secondly, the top 10 most frequently used core values include Excellence, Innovation, Collaboration, Responsible, Impactful, Integrity, Respectful, Diversity, Inclusiveness, and Community. The ten most frequent values are universal by nature, and there seems to be no specific relationship with any country or ranking of BS. Thirdly, core values are further classified as professional values (54%), moral values (19%), and cultural values (27%). Moreover, US BS have shown a slightly higher frequency count for professional and moral values, while non-US BS have a higher frequency count for cultural values. Finally, only 9% of the top 100 BS consider 'Entrepreneurship' as their core value. Reliance on purely descriptive analyses is one of the limitations of this research. This study suggests that BS must have a well-articulated, well-published, and well-circulated set of core values, which will eventually help them make decisions. This paper also draws the attention of BS leaders that their core values must have a balanced set of core values, including professional, moral, and cultural values, which will shape their persona more balanced.

Keywords: core values; professional values; moral values; cultural values; business school; content analysis

Reference to this paper should be made as follows: Ahmad, Sh., Bajwa, I., Aftab, F., Mahmood, K.Ch., Siddiqui, K. 2024. Do top business schools consider entrepreneurship as a core value? *Entrepreneurship and Sustainability Issues*, 12(2), 53-70.
http://doi.org/10.9770/a9728395726

JEL Classifications: L26

1. Introduction

During the last five decades, 'Core Values' gained paramount importance in facilitating decision-making, attaining a common goal, differentiating between right and wrong, and ultimately creating a positive work environment. Institutional core values serve as a unifying force among all stakeholders, focusing on organizational culture as core values are an integral part of the culture (Akpamah, et al., 2021).

Core values are considered critical to the marketing strategies of BS (Farhat et al., 2021). BS communicate its core values to stakeholders through its official communication channels, social media platforms, and electronic word of mouth (eWoM) (Carvalho et al., 2021). The promotion of core values influences BSs positively in

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

numerous ways. These include enhancing customer-based brand (Khoshtaria et al., 2020), academic competency (Shafaei et al., 2019), reputation (Khoshtaria et al., 2020), attracting students (Tasel-Jurkovic & Altinbasak-Farina, 2021), and internationalizing the BS brand (Yousaf et al., 2020). Core values are thought to be important in developing BSs' positive brand image (Borsetto, 2021), particularly campus diversity, which has a positive impact on their students' diversity awareness and social trust while having no negative effects on BSs' internal brand identification (Yao et al., 2019).

BS have long been blamed for the world's financial crises (Goydke, 2022). They claimed that almost all senior executives in the financial crisis received their degrees from prestigious BS. Additionally, there is a high correlation between the recent unethical practices of several multinational corporations and the number of BS graduates in their top ranks. Furthermore, future business leaders believe that the current core values of corporations do not meet society's needs adequately, and an updated set of core values must be developed and practised in business (Waddock, 2020). Finally, core values are explicitly taught and practised by BS as compared to any other educational institution. That makes BS an interesting choice for studying core values.

Recent literature suggested that core values are paramount in building a brand for BS. However, as discussed in the literature review, previous studies did not examine the core values of BS in great detail. Thus, the current study aims to fill the gap by conducting a content analysis of the core values of the world's top BS. The aim is to synthesize and classify the core values to provide generalizable answers to the following questions:

1. What are the most frequently used core values by the top BS?
2. On average, how many core values are adopted by a single BS?
3. Is there any difference in core values used by US and non-US BS?
4. Do top BS consider 'entrepreneurship' as a core value?

2. Literature Review

Core values are the fundamental principles upon which an organization is built. These values serve as corporate DNA that guides the management in decision-making and setting up corporate objectives, vision, and mission. These shared values unite all managers and employees and help them work together to achieve common organizational goals (Walkiewicz et al., 2021). Besides, the core values serve as building blocks for creating the desired organizational culture. Internally, the core values are the ultimate essence of knowledge and intelligence that compose an organization's intellectual capital (Bongiovanni et al., 2020). On the external frontier, these values guide the organization in managing and dealing with various stakeholders, especially the customers, society, government, and environment. The core values being the essence of an organization leads it to success and sustainable longevity (Ahmad et al., 2020). All organizations do possess core values; however, another debate is how these values are emphasized in official statements and communicated to the stakeholders via various channels. Almost all BSs possess and officially display their core values. BS take a special place in this regard since they understand and teach the importance of core values, vision, and mission statements for any business.

There is a plethora of literature on BS and its strategies, but the discussion on the core values of BS is very thin. For example, in Thailand's BS, it was discussed that loyalty among international students is an outcome of service quality (Kashif & Cheewakrakokbit, 2018). For the Indian B-school market, it has been argued that trust builds brand loyalty and brand advocacy (Dass et al., 2021). Furthermore, the core values of the BS seemed to have a strong influence on the school's undergraduate curriculum (Hales & Phi, 2021). Another study on institutional marketing from the Netherlands proves the significance of universities' core values in creating a positive brand image to differentiate from the competition and attract prospective students (Walter et al., 2022). Research in Indonesia has described that creating both positive cognitive and affective brand images is helpful in attracting students (Hendriana et al., 2021). Largely ignored in past studies, this study provided the much-needed descriptive analyses of core values for BS in aggregate form.

The body of knowledge on corporate core values, in general, is ample. Much research has been conducted so far on core values from various perspectives. A literature review suggests that most current research on core values focuses on organizational culture (Bamidele, 2022). It was further stressed that values are an integral

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

part of a culture, be it corporate values and culture or personal values and national culture. Many have been written on core values from a strategic management perspective regarding corporate goals, vision, and mission statements (Akpamah et al., 2021). Some recent studies in this regard include Akter (2021) and Siat (2021). Likewise, core values and organizational performance are also areas of interest to Abuzarqa (2019). However, research on core values in higher education institutions is quite a handful. Some of the most recent studies on the core values of higher education institutions include Siat (2021), Toker Gökçe (2021), and Simões (2019). When it comes to research on the core values of BS, the extant literature significantly shrinks to very few studies, such as Suárez-Barraza et al. (2019) and Peters et al. (2018). However, these two studies addressed core values in BS from different perspectives. Suárez-Barraza et al. (2019) focused on Kaizen core values in AACSB-accredited BS. Peters et al. (2018) presented a critical literature review on BS, but content analysis of the core values is still missing.

At the individual level, values are abstract beliefs about desired end-states of existence that influence choices made by individuals. They are the convictions or ideals of the institution that serve as foundations for which the institution is held accountable (Bunkowski, 2019). These values serve as guiding principles of an organization's planning and policy creation that influence the attitudes, norms, and beliefs of people working (Barbados & Ernoglu, 2022). Values are essential in building the ethical makeup of individuals in organizations and motivating them towards higher performance. Sull, Turconi, and Sull (2020) found that ethical core values such as respect, fairness, and honesty in a managerial and organizational context are linked to employee motivation, commitment, and loyalty. Moreover, Barbados and Ernoglu (2022) found that the ability to innovate in organizations is highly dependent on the core values and beliefs of the organization. They found that the shared core values in Innovation organizations are customer focus, quality, openness, and transparency, in addition to building an environment of care and trust in the organization.

Corporate values tend to stand on similar pillars such as quality, responsibility, and loyalty, indicated by the organization as the key to its success. Based on that, values are essential in determining the behaviour of employees, internal operations of the organization, how to deal with the external world, and building an image consistent with the organization's characteristics and environment (Martin et al., 2020). Organizations tend to choose specific values from the standard set of values to be considered the organization's core. The selection of core values usually depends on analyzing the organization's environment and its internal characteristics, structures, policies, objectives, and the nature of its operations and market (Elg et al., 2017).

Though core values vary between organizations, most have some frequently mentioned core values: quality, customer satisfaction, innovation and modernity, transparency, integrity, knowledge sharing, and professionalism. However, values tend to vary at the organizational level. Still, they focus on reflecting an organizational identity shared with other similar local or global organizations, such as equality, responsibility, and justice (Felix, 2020). Although organizational identity can be reflected in other official documents and statements, such as vision, mission, and annual reports, core value statements explicitly express the organization's identity to the public (Wæraas, 2018). However, organizational values can also reflect a unique identity that no other organization shares. For example, (Ryu, Walls, & Louis, 2022) identified the value of "caring" as critical for schools' success.

Organic core values can be differentiated from mechanistic organizational core values (Borboa-Álvarez et al., 2020). Organic core values are openly collaborative, creative, encouraging, sociable, relationship-oriented, equitable, empowering, trusting, and information-sharing. In contrast, mechanical organizational core values feature high control and being cautious, task-oriented, rigidly structured, hierarchical, and values-oriented toward pressure, power, and procedures for centralization. They found that organizations with organic core values reported a higher level of social responsibility than managers in organizations with mechanistic values. Similarly, organic organizational core values (democratic, informal, collaborative) were distinguished from mechanistic core values (bureaucratic, formal, centralized). They found that business students who prefer organic core values also generally commit more to corporate social responsibility and ethics.

Educational values worldwide witnessed frequent changes due to commodification, commercialization, and privatization of the education system (Hogan & Thompson, 2020). Therefore, institutional success can be

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

measured by how effectively an institution revises its core values (Bunkowski, 2019). Various core values can be found in BS. For instance, Haski-Leventhal et al. (2022) identified the values of commitment, respect, belief in authentic learning, caring, and ethical awareness as conducive values for headteachers in building a positive school culture. Moreover, Martin et al. (2020) identified ten core values for schools in New Zealand: integrity, determination, courage, responsibility, craftsmanship, service, perseverance, humility, respect, and compassion. Later, these values were reduced to the most important four (greatness, compassion, responsibility, and integrity).

The Delphi technique was also used to identify and prioritize the shared values of university students (Campbell, Gusto, & Diaz, 2023). They consider these values critical in supporting and facilitating student organizations' effectiveness, ultimately optimizing student and organizational outcomes.

More recently, Toker Gökçe (2021) examined the underpinning core values that educators should have and that students must acquire at schools. They categorized such values into moral, professional, and cultural values. This classification of core values was further replicated among the top 100 global BS by Siddiqui and Ahmad (2022), as shown in Table 1.

Table 1. Types of Core Values with examples

Types	Definition	Examples
Moral Values	Moral values refer to principles that distinguish right from wrong and reflect a person's character—used in individual decision-making or justifications, intentions, and actions.	Virtue, Justice, Sympathy, Equality, Affection, Respect, Humanism, Tolerance
Professional Values	Professional values refer to the traits that must be demonstrated at the workplace in a certain profession or industry. These traits include skills, behaviours, and actions that many employers look for and desire in an employee.	Discipline, Diligence, Cooperation, Friendship, Devotion, Responsibility, Openness to change, Entrepreneurship.
Cultural Values	Cultural values refer to a set of beliefs that a society, ethnic group, region, country, or even an entire hemisphere (East vs. West) considers important.	Democracy, Freedom, Patriotism, and Unity.

Source: Authors‘ contribution

3. Methodology

The population of this study includes the top 100 BS. The sample used in this study comprised 50 US BS and 50 non-US BS. Multiple criteria were used to select BS for this study. Firstly, BS must have published its core values publicly. Secondly, BS must be ranked by at least two of the following BS rankings during the last three years.

US News Ranking: U.S. News & World Report is an American media company that publishes BS rankings on an annual basis (Gadd, 2020).

Business Week Ranking: Bloomberg BusinessWeek is another American weekly business magazine that publishes an annual BS ranking (Lozano et al., 2020).

Forbes: Forbes is a global media company focusing on business, investing, technology, entrepreneurship, leadership, and lifestyle (Quinteros et al., 2020).

Economist: The Economist is a British weekly newspaper published digitally that focuses on current affairs, international business, politics, technology, and culture and publishes ranking for global BS (Boric et al., 2024).

Financial Times: Despite some criticism, the Financial Times ranking of BS is the most prominent and popular ranking highly perceived by the target audience, including universities, BS, current and prospective students, alumni, and deans (Lim, 2021). Financial Times evaluates BS on several variables and publishes an annual ranking every year (Kaltenecker & Okoye, 2024).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

QS Ranking: QS World University Rankings is an annual publication of university rankings by Quacquarelli Symonds (QS). They also provide subject-specific rankings like engineering, business law, etc. (Khan et al., 2020). Table 2 presents the selection criteria for BS used for this study. It reflects BS, country of origin, and rankings for their BS as selection criteria.

Table 2. Selection criteria for Business Schools included in this study

#	Business School	Country	U	B	Fo	Ec	Fi	Q
1	Melbourne Business School, University of Melbourne	Australia				√	√	√
2	Alberta Business School, University of Alberta	Canada					√	√
3	Desautels Business School, McGill University	Canada				√		√
4	Gustavson School of Business, University of Victoria	Canada					√	√
5	Ivey Business School, University Western Ontario	Canada	√			√		√
6	John Molson School of Business, Concordia University	Canada		√		√		√
7	Rotman School of Management, University of Toronto	Canada					√	√
8	Sauder School of Business, University of British Columbia	Canada					√	√
9	Smith Business School, Queen's University	Canada				√	√	√
10	Ted Rogers School of Management, Toronto Metropolitan University	Canada		√		√		√
11	China Europe International Business School (CEIBS)	China				√		√
12	College of Business, Shanghai University of Finance and Economics	China				√		√
13	CUHK Business School	China				√		√
14	Renmin Business School, Renmin University	China				√		√
15	Copenhagen Business School, University of Copenhagen	Denmark		√			√	√
16	INSEAD	France				√		√
17	EDHEC Business School	France				√		√
18	ESSEC Business School	France				√		√
19	HEC Paris	France				√		√
20	ESCP Business School	Germany				√	√	√
21	ESMT Berlin	Germany				√		√
22	Mannheim Business School	Germany				√		√
23	WHU – Otto Beisheim School of Management	Germany				√		√
24	Indian Institute of Management Bengaluru (Bangalore)	India				√		√
25	Indian Institute of Management Kolkata (Calcutta)	India					√	√
26	Indian School of Business	India				√		√
27	Trinity Business School, Trinity College Dublin	Ireland				√	√	√
28	SDA Bocconi School of Management	Italy				√		√
29	Rotterdam School of Management, Erasmus University	Netherlands				√		√
30	TiSEM Tilburg School of Management, Tilburg University	Netherlands				√	√	√
31	Lee Kong Chian School of Business, Singapore University	Singapore				√		√
32	NUS Business School, National University of Singapore	Singapore		√		√	√	√
33	ESADE Business School	Spain		√	√	√	√	√
34	ESIC – Business & Marketing School	Spain			√	√		√
35	IE Business School	Spain		√	√	√	√	√
36	IESE Business School	Spain		√	√	√	√	√
37	Business School, University of St Gallen	Switzerland		√		√		√
38	IMD Business School	Switzerland		√		√		√
39	Adam Smith Business School, University of Glasgow	UK				√	√	√
40	Durham Business School, University of Durham	UK		√		√		√
41	Edinburgh Business School, University of Edinburgh	UK		√		√		√
42	Imperial Business School, Imperial College	UK				√		√
43	Judge Business School, University of Cambridge	UK			√	√	√	√
44	Lancaster Management School, University of Lancaster	UK				√	√	√
45	Leeds Business School, University of Leeds	UK				√	√	√
46	London School of Economics and Political Science	UK			√		√	√
47	Manchester Business School, University of Manchester	UK		√	√		√	√
48	Saïd Business School, University of Oxford	UK				√		√
49	Strathclyde Business School, University of Strathclyde	UK				√	√	√
50	Warwick Business School, University of Warwick	UK			√	√	√	√
51	Atkinson Graduate School of Management, Willamette University	USA	√	√	√			√
52	Babson College	USA	√	√			√	√
53	Broad College of Business, Michigan State University	USA	√	√	√	√	√	√
54	Carroll School of Management, Boston College	USA	√	√				√
55	Columbia Business School, Columbia University	USA	√	√	√	√	√	√

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

56	Cox School of Business, Southern Methodist University	USA	√	√	√	√		√
57	D'Amore-McKim School of Business, Northeastern University	USA	√	√				√
58	Darden Graduate School of Business, University of Virginia	USA	√	√	√	√	√	√
59	Darla Moore School of Business, University of South Carolina	USA	√	√		√		√
60	David Eccles School of Business, University of Utah	USA	√	√	√		√	√
61	Eller College of Management, University of Arizona	USA	√	√		√		√
62	Fisher College of Business, Ohio State University	USA	√	√	√	√	√	√
63	Foster School of Business, University of Washington	USA	√	√	√	√	√	√
64	Freeman School of Business, Tulane University	USA	√	√	√			√
65	Gabelli School of Business, Fordham University	USA	√	√	√			√
66	Goizueta Business School, Emory University	USA	√	√	√	√	√	√
67	Graziadio Business School, Pepperdine University	USA	√	√	√			√
68	Harvard Business School, Harvard University	USA	√	√	√	√	√	√
69	Haslam College of Business, University of Tennessee	USA	√	√	√			√
70	Kelley School of Business, Indiana University	USA	√	√	√	√	√	√
71	Kenan-Flagler Business School, University of North Carolina	USA	√	√	√	√	√	√
72	Leeds School of Business, the University of Colorado at Boulder	USA	√	√	√			√
73	Martin Whitman School of Management, Syracuse University	USA	√	√				√
74	Mays Business School, Texas A&M University	USA	√	√	√	√		√
75	McDonough School of Business, Georgetown University	USA	√	√	√	√	√	√
76	Jindal School of Management, the University of Texas at Dallas	USA	√	√	√	√	√	√
77	Neeley School of Business, Texas Christian University	USA	√	√		√		√
78	Olin Business School, Washington University in St. Louis	USA	√	√	√	√	√	√
79	Owen Graduate School of Management, Vanderbilt University	USA	√	√	√	√	√	√
80	Pitt College of Business, University of Pittsburgh	USA	√	√	√	√	√	√
81	Poole College of Management, North Carolina State University	USA	√	√				√
82	Questrom School of Business, Boston University	USA	√	√	√	√	√	√
83	Rady School of Management, University of California, San Diego	USA	√	√			√	√
84	Raymond Mason School of Business, College of William & Mary	USA	√	√	√			√
85	Robert Smith School of Business, University of Maryland, College Park	USA	√	√	√	√	√	√
86	Ross School of Business, University of Michigan	USA	√	√	√	√	√	√
87	SC Johnson Graduate School of Management, Cornell University	USA	√	√	√	√	√	√
88	Scheller College of Business, Georgia Institute of Technology	USA	√	√	√	√	√	√
89	School of Business, George Washington University	USA	√	√	√	√	√	√
90	Simon Business School, University of Rochester	USA	√	√	√	√	√	√
91	Smeal College of Business, Penn State University	USA	√	√	√	√	√	√
92	Stanford Graduate School of Business, Stanford University	USA	√	√	√	√	√	√
93	Stern School of Business, New York University	USA	√	√	√	√	√	√
94	Tepper School of Business, Carnegie Mellon University	USA	√	√	√	√	√	√
95	Tuck School of Business, Dartmouth College	USA	√	√	√	√	√	√
96	UCLA Anderson School of Management, University of California	USA	√	√	√	√	√	√
97	Weatherhead School of Management, Case Western Reserve University	USA	√	√	√	√		√
98	Wharton School, University of Pennsylvania	USA	√	√	√	√	√	√
99	Wisconsin School of Business, University of Wisconsin at Madison	USA	√	√	√	√	√	√
100	Yale School of Management, Yale University	USA	√	√	√	√	√	√

Source: Siddiqui & Ahmad, 2023

Table 3 summarizes the country of origin and the number of BS selected from each country. It reveals that half (50%) belong to the United States alone, while the remaining 50% are from the rest of the world, split among 14 countries.

Table 3. Country-wise Summary of Business Schools (N=100)

Country	Number of Business Schools
Australia	1
Canada	9
China	4
Denmark	1
France	4
Germany	4
India	3
Ireland	1

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

Italy	1
Netherlands	2
Singapore	2
Spain	4
Switzerland	2
UK	12
USA	50
Total	100

Source: Siddiqui & Ahmad, 2023

Table 4 presents a summary of rankings for BS selected for this study. All US BS were ranked high in the US News, Business Week, and QS world rankings, while non-US BS were evaluated in different rankings.

Table 4 Summary of Business School Rankings: US VS Non-US (N=100)

Region	Rankings						
	US News	Business Week	Forbes	Economist	Financial Times	Business Insider	QS World
Non-US	0	12	8	38	23	33	50
US	50	50	41	36	33	25	50
Total	50	62	49	74	56	58	100

Source: Siddiqui & Ahmad, 2023

The core values of the selected 100 BS were extracted from their official websites. This technique of collecting important information through official websites is quite common in earlier studies on official artifacts of universities (Ahmad, 2021; Siat, 2021; Simões, 2019; Toker Gökçe, 2021), non-profit education institutions (Wilkerson & Evans, 2018), or even in BS (Mazurek et al., 2020; Siddiqui, 2021). The mandatory criterion for any business selected for this study was the availability of core values on official websites (commonly appearing along with mission and vision statements with a clear heading). Furthermore, all efforts were made to ensure there was no loss of information or redundant information in the database. The data was collected, processed, and checked by different team members at different times to maintain authenticity. Keywords were separated from core values as many core values had more than one keyword. Table 5 presents a summary of core values from the top 100 BS along with respective keywords.

Table 5 Summary of Core Values from Top Business Schools: US VS Non-US (N=100)

Region	Core Values		Keywords	
	Frequency	Average	Frequency	Average
Non-US	230	4.6	281	5.6
US	243	4.9	303	6.1
Total	473	4.7	584	5.8

Source: Siddiqui, & Ahmad, 2023

Based on the nature of the study, a content analysis technique was employed to achieve the objective. For instance, content analysis is commonly used in contemporary business studies (Bayrak, 2020; De Francisco & Prada, 2019). This method offers researchers a chance to collect data qualitatively and quantitatively through various channels such as verbal, print, and electronic data (Wilkerson & Evans, 2018). Content analysis is a "textual analysis technique making inferences by objectively and systematically identifying specified characteristics of messages" (Shapiro, & Markoff, 2020). The extant literature has extensively used content analysis to analyze vision, mission statements, and core values. This technique has been employed in different industries, cross-country analyses, and academia. Previous studies on corporate core values also employed content analysis techniques, such as those of Suárez-Barraza et al. (2019) and Peters et al. (2018).

Entrepreneurship as a core value: Literature suggests that 'entrepreneurship as a core value' means that management, staff and students shall exhibit entrepreneurial skills and competencies for the generation and dissemination of knowledge, not that the university/business school should focus on new venture creations in every programme (Mwatsika et al., 2018; Gagnidze, 2018). Entrepreneurship is very close to top business from many dimensions, they teach entrepreneurship (Siddiqui, & Alaraifi, 2019), design curriculum for entrepreneurship (Al Hudithi & Siddiqui, 2021), run business incubators and accelerator programs (Siddiqui et al., 2021), facilitate their students into the entrepreneurial ecosystem (Al-Shaikh, & Siddiqui, 2021), facilitate

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

their venture capitals, and suggest way to improve their credit ratings. Therefore, it was further stressed that universities and BS should embrace entrepreneurship as a core value (Nabil Ghobril, et al., 2020). For this study top 10 BS were also selected based on US News Business School Ranking for Entrepreneurship and their core values where their core values were studied. Table 6 presents Entrepreneurship as a core value among top BS ranked high for Entrepreneurship.

Table 6 Entrepreneurship as a core value among top BS ranked high for Entrepreneurship

Top Business Schools ranked for Entrepreneurship	Business School	Country	Entrepreneurship as Core Value
1	Olin Graduate School of Business	USA	
2	Graduate School of Business	USA	
3	MIT Sloan School of Management	USA	
4	Haas School of Business	USA	
5	Harvard Business School	USA	
6	Wharton Business School	USA	
7	Stephen M Ross School of Business	USA	Yes
8	Kelley School of Business	USA	Yes
9	McCombs School of Business	USA	
10	Hankamer School of Business	USA	

Source: Siddiqui, & Ahmad, 2023

Results and discussions

This section provides data analysis and discussions on descriptive statistics such as country-wise analysis of BS with and without core values, core value frequency analysis, classification of core values, most frequently and commonly used core values, and core values clusters.

Core values serve as a basis for organizational vision, mission, and objectives. Therefore, core values shared across the organization and with all stakeholders have significant implications. In addition, core values guide the whole organization in decision-making and serve as an ethical compass for leadership, management, and employees. Thus, sharing the core values is vital for organizational success and functionality and keeping them within the management. These findings challenge the extant research that emphasizes the critical impact of shared values on organizational operations, performance, and sustainability.

Core values frequency analysis: While identifying the organizational core values, management often wonders how many core values should be appropriate. While some organizations mention the core values as standalone words, others identify them in core values statements. Thus, there is no uniform global standard on the count of core values and their format. This section examines how the top 100 global BS identify their core values. It is observed that, on average, these schools have 4.7 (or 4 to 5) core values either written standalone as separate words or in a values statement.

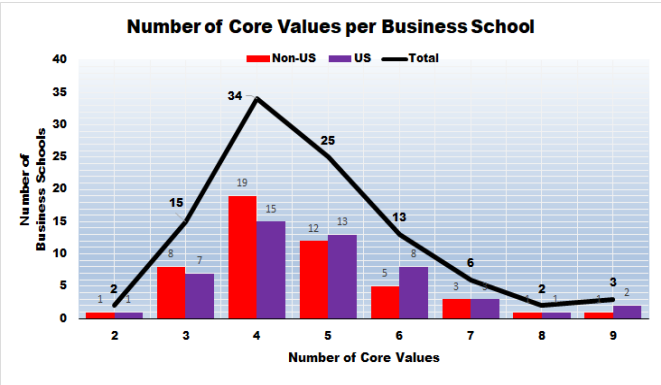


Figure 1. Top Business Schools' Core Values Frequency Analysis (N=100)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

As shown in Figure 1, the count/frequency of the standalone values ranges between 2 and 9. For instance, Graziadio BS, Pepperdine University has two standalone values: Integrity and Innovation. Similarly, Renmin University of China BS also has two core values, Innovation, and Excellence. Though two BS exists on the other extreme having nine core values. These two BS include Stanford Graduate School of Business, Stanford University, USA, and Indian BS, India. While most schools (87%) have between 3 and 6 core values.

Most frequently used core values: An analysis of frequently used keywords as core values was performed using SPSS. The analysis revealed that the top BS in the world frequently used ten core values, as indicated in Table 7.

Table 7 Most Frequently Used Core Values in Business Schools

Core Values	Frequency
Excellence	46
Integrity	42
Diversity	31
Innovation	30
Collaboration	29
Inclusion	29
Respect	22
Responsibility	15
Impact	13
Community	12

Source: Siddiqui & Ahmad, 2023

Further analysis of frequently used keywords as core values was performed using Voyant Tools. The analysis revealed that the top BS in the world frequently used ten core values, as indicated in Figure 2. The size of the word in the figure indicates the frequency; the more significant the size, the higher the frequency. The exact frequency of these words is provided in Table 8. 'Excellence' has been the most used core value utilized by 46 BS. This core value truly represents the schools as they symbolize excellence at the world level. Other commonly used core values include integrity, diversity, collaboration, innovation, respect, and inclusiveness. These top ten frequently used core values justify the position of these schools on the global ranking. What impact do the commonly used core values have on the top BS that can be an exciting research agenda for future researchers?



Figure 2. Most common core values of business school

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

Classification of core values: This study identified 473 core values having 584 keywords in the top BS. Core values can be classified into three broader categories: professional, moral, and cultural Toker Gökçe (2021). This study has categorized the most frequent values into three broader categories: professional, moral, and cultural.

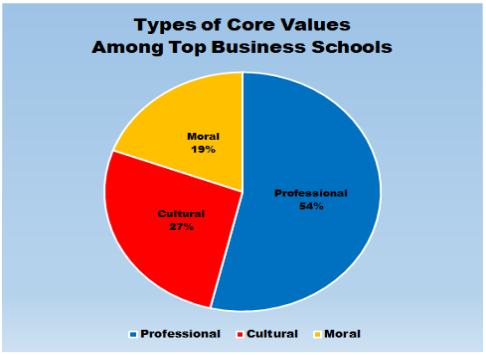


Figure 3. Types of core values in top business schools

The core values 'Excellence', 'Collaboration', and 'Innovation' were regarded as professional values. While 'Integrity' and 'Respect' were classified as moral values, 'Diversity' and 'Inclusiveness' belonged to cultural values. Figure 3 shows the types of core values in top BS as 54% Professional, 27% Cultural, and 19% Moral values.

Comparison of Core Values US VS Non-US Business Schools: Further analyses were based on the division of BS based on US and non-US. Tables 8 and 9 present a comparative account of core values between US and Non-US BS. Based on similar frequency, common core values include Excellence (Professional), Collaboration (Professional), Respect (Moral), Diversity (Cultural), and Community (Cultural). US BS have a higher frequency count on Impact (Professional), Integrity (Moral), and Inclusiveness (Cultural) while non-US BS have a higher frequency count on Innovation and Responsibility (both Professional).

Table 8 Most Frequently Used Professional Core Values in Business Schools

Professional Core Values				Moral Core Values				Cultural Core Values			
Keywords	Non-US	US	Total	Keywords	Non-US	US	Total	Keywords	Non-US	US	Total
Excellence	23	23	46	Integrity	14	28	42	Diversity	15	16	31
Innovation	17	13	30	Respect	11	11	22	Inclusion	9	20	29
Collaboration	15	14	29	Engagement	4	3	7	Community	6	6	12
Responsibility	10	5	15	Ethical	3	2	5	Equity	3	6	9
Impact	3	10	13	Humanity	4	1	5	Freedom	2	4	6
Rigorous	5	4	9	Honesty	2	2	4	Societal	4	2	6
Entrepreneurship	7	2	9	Caring	4		4	Curiosity	5	1	6
Professional	2	4	6	Compassion		3	3	Openness	6	0	6
Commitment	3	3	6	Trust	2	1	3	Sustainability	4	0	4
Teamwork	3	3	6	Courage	3		3	Tolerance	2	1	3

Source: Siddiqui, & Ahmad, 2023

Figure 4 shows a comparative account of core values US VS Non-US. US BS tend to have a higher weight on Professional and Moral values while non-US BS have a higher frequency count on Cultural values.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

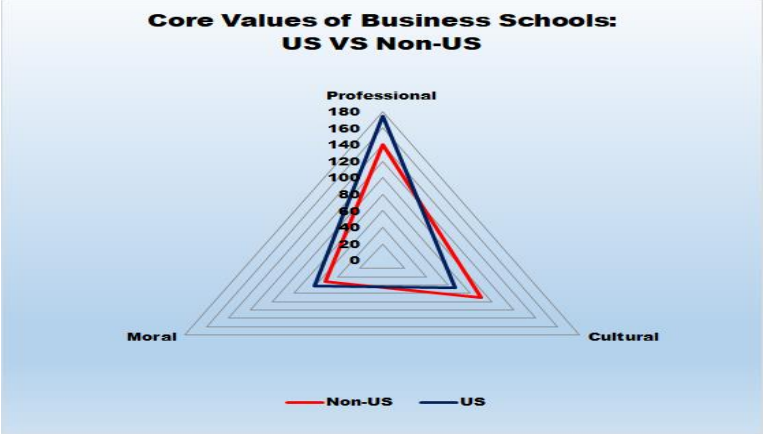


Figure 4. Core values of top business schools: US VS Non-US

Core values Vocabulary Density: The top BS belong to 15 different countries but share some common core values and clusters of core values. An analysis of the cluster through Voyant Tools revealed that the seven most frequently used core values have been utilized together in a significant number of schools (Figure 5).

As shown in Figure 5, the blue-coloured values form three significant clusters: excellence, diversity, and integrity. The connecting lines show the link between these core values, and the line width shows the link strength. For example, the first cluster, excellence, shows that 'excellence' has been used as a core value in schools' innovation, respect, diversity, and integrity. However, the line width between excellence and integrity emphasizes that these two values have been used together by many schools. Likewise, the BS that used diversity as core values also used respect, collaboration, integrity, and community. Finally, the BS emphasizing integrity also chose community, respect, diversity, and excellence. These clusters show that the top BS have three sets of core values.

A vocabulary density analysis of the data was performed using Voyant Tools. According to Ahmad (2021); vocabulary density refers to "the ratio of the total number of words to the number of unique words in a document. Therefore, a higher vocabulary density value close to 1 indicates a simple text with fewer unique words. On the other hand, a lower density value represents a complex text with greater unique words". The vocabulary density of the data in this study appeared to be on the lower end with a value of 0.355, meaning that the top BS have a wide variety of unique words or core values. This is justified and aligned with the notion that these BS belong to 15 different nations with different national cultures and moral and professional values.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

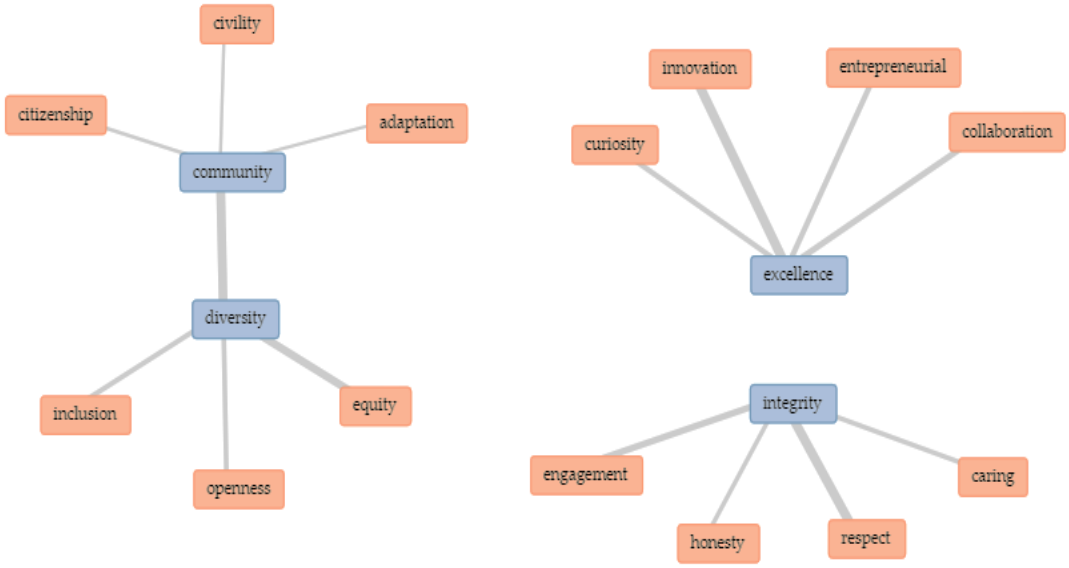


Figure 5. Core values cluster analysis of top 100 business schools

Entrepreneurship as a Core Value: Table 6 mentions the top ten core values exhibited by top business schools, and entrepreneurship is not included. Table 7 suggested 9 business schools are using entrepreneurship as a core value. Table 8 presents the list of BS having entrepreneurship as a core value.

Table 9 Entrepreneurship as a core value among top BS

No.	Business School	Country	Entrepreneurship as a Core Value
1	Smith Business School, Queen's University	Canada	Yes
2	INSEAD	France	Yes
3	HEC Paris	France	Yes
4	WHU – Otto Beisheim School of Management	Germany	Yes
5	SDA Bocconi School of Management	Italy	Yes
6	IE Business School	Spain	Yes
7	Saïd Business School, University of Oxford	UK	Yes
8	Tepper School of Business, Carnegie Mellon University	USA	Yes
9	David Eccles School of Business, University of Utah	USA	Yes

Source: Siddiqui, & Ahmad, 2023

Our results indicate that out of the top 100 BS, only nine have mentioned entrepreneurship as one of their core values (9%). This small number supports the earlier research that BS need to change their mindset from 'corporate success' to 'entrepreneurial success' (Siddiqui & Alaraifi, 2019). Table 9 presents a list of business schools having 'entrepreneurship' as a core value.

5. Conclusions

The primary goal of this research was to examine sustainability as a core value among top BS. A very small frequency occurred in the data reflecting ‘sustainability’ as a core value. It is reasonable to conclude that ‘entrepreneurship’ is an important aspect of BS but not at the top of the list. Another objective of this research was to examine the core values of the top 100 global BS that appeared in at least two BS rankings. These rankings include US News, Business Week, Forbes, the Economist, Financial Times, and QS Rankings. The core values were derived from publicly available sources such as official websites. Using the content analysis technique, core values were analyzed for frequency, commonality, clustering, and vocabulary density. According to the study's design, half (50%) of the top BS were from the United States, and the other half (50%) were from 14 different countries.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

According to the findings, most top BS identified 4 to 5 core values on average. Excellence, Innovation, Collaboration, Responsible, Impactful, Integrity, Respect, Diversity, Inclusiveness, and Community are the top ten most frequently used core values. By nature, these values appear to be universal with no apparent relationship to any country or ranking of BS. These core values can be classified as professional (54%), moral (19%), and cultural values (27%). A comparison of core values from US and non-US BS revealed that the US has a slightly higher frequency count for professional and moral values. In contrast, non-US BS have a higher frequency count for cultural values.

6. Originality and Novelty of Research

This research has many merits worthy of recognition. Firstly, this research provides an anatomy of core values in BS. Earlier studies have shown great interest in core values, but examining the physical characteristics of core values is almost missing. Most often, it was used as the independent variable (Enders & Lupton, 2021) or a dependent variable (Hsieh, 2021). But this research provides a dissection of core values which was missing in the literature. Secondly, BS are often blamed for the world's financial crises through the involvement of its alumni. But there was no research answering that stigma. The current research suggests through data that BS inculcate more professional values than moral values in their students. Overall, the top 100 BS have classified their core values as 54% professional, 27% as cultural, and 19% as moral values. Thirdly, many people ask about the difference between US and non-US BS. Our results suggest that the US BS tend to have a higher weight on Professional and Moral values while non-US BS have a higher frequency count on Cultural values. Fourth, people must know how many core values are enough for one organization. Our data suggest no uniform global standard on the count of core values and their format. However, it is observed that, on average, these BS have 4.7 (or 4 to 5) core values either written standalone as separate words or in a values statement. Fifth, researchers were always interested in knowing the most frequently used core values in originations, especially in BS. Our data suggest that the top 10 most frequently used core values include Excellence, Innovation, Collaboration, Responsible, Impactful, Integrity, Respectful, Diversity, Inclusiveness, and Community. Finally, business schools are considered as a modern-day nursery for entrepreneurs and entrepreneurship. Questions are always raised about whether top BS consider ‘entrepreneurship‘ as a core value. Results suggest that only 9% BS consider entrepreneurship‘ as their core value.

6. Implications

Our study provides several implications for BS, its stakeholders, and society. Firstly, it addresses the BS’s leadership as they are responsible for shaping current and future corporate leadership. A well-articulated, well-published, and well-circulated set of core values of BS will make their leadership lives easier. It will provide a basis for decision-making, improving it even in adverse circumstances. It will also help them in troubleshooting their problematic areas. For example, ‘Excellence’ has emerged as the most frequently used keyword in our survey. It means BS, having ‘Excellence’ as one of their core values, will achieve ‘Excellence’ in everything they do, whether it is delivering education, patronizing research, hiring faculty, or even recruiting students. Secondly, this paper draws the attention of BS leaders, who believe their core values, including professional, moral, and cultural values, must be balanced. Having only a professional, moral, or cultural set of core values may leave the school’s overall persona unbalanced and incomplete. More recently, cultural core values like diversity, inclusion, tolerance, and equity have even been required by national or international agencies as part of BS’s manifesto. Thirdly, by transferring and, more importantly, inculcating the core values in their faculty and students, BS have a chance to clear their names from global scams like the world's financial crises. Society must understand that core values are explicitly taught and practised by BS as compared to any other BS. That makes BS a better place to inculcate core values among their students and at least lower the impact of malicious corporate practices. For example, ‘Integrity’ has emerged as the second most frequently used keyword in our survey. This should not only be written on the websites, walls, corridors, or even on doors. Rather, it should be engraved on the hearts of their students, faculty, and staff. This can only be achieved by practising the core values of BS in their decision-making. Fourth, this paper highlights the mechanics of developing and adopting core values in BS. To maintain corporate trust in BS amid today’s complexity and uncertainty, BS need to define its core values explicitly, clearly communicate them to staff, students, and stakeholders, and demonstrate its core values in the form of practice and decision-making. The message must be communicated to all stakeholders

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

that core values cannot be artificially constructed, imported, or copied. Rather, these should be developed and shared by all. Fifth, this research emphasizes that core values represent the foundation pillar of any BS, and there must not be too many. A significant number of BS (87%) in our sample declare a number between 3 and 6 core values. Core values should be grounded on a few but necessary core values. Finally, this paper attempts to emphasize the significance of core values for BS because core values reflect academic competence, reputation, and positive brand image among students, and most importantly, core values help them attract local and international students.

7. Limitations and future research directions

Because of its descriptive nature, this exploratory study has some limitations. Descriptive analyses only explain the current state of affairs and do not explain the reasoning behind these statistics. The commonly used values identified in this study are subject to further investigation to determine whether these values are related to any country or business ranking. Future researchers may concentrate on these areas. Other exciting research areas include looking into the role of core values in the success of top BS and the relationship between core values and organizational performance and effectiveness.

References

Abuzarqa, R. (2019). The relationship between organizational culture, risk management, and organizational performance. *Cross-Cultural Management Journal*, 21(1), 13-20.

Ahmad, S. (2021). The Gap between Strategic Management Theory and Practice: Mission Statements Analysis of 100 Best Global Brands, 3rd Eastern European Conference of Management and Economics EECME, Ljubljana, Slovenia.

Akpamah, P., Ivan-Sarfo, E., & Matkó, A. (2021). Organizational Culture as A Strategy. *Cross-Cultural Management Journal*, 23(1).

Akter, S. (2021). Companies' vision, mission, and core values focus on human resource management. *International Journal of Financial, Accounting, and Management*, 2(4), 343-355. https://doi.org/10.35912/ijfam.v2i4.412

Al Hudithi, F., & Siddiqui, K. A. (2021). Designing the guidelines for FinTech curriculum. *Entrepreneurship and Sustainability Issues*, 9(1), 633. https://doi.org/10.9770/jesi.2021.9.1(39)

Bamidele, R. (2022). Organizational culture. *Industrial Sociology, Industrial Relations and Human Resource Management*, 284-292.

Barbados, S., & Ernoglu, A. (2022). Innovation and Creativity as Core Value at Creative Industry Companies. *International Journal of Design Innovation*, 1(1), 36-50.

Bayrak, T. (2020). A content analysis of top-ranked universities' mission statements from five global regions. *International Journal of Educational Development*, 77, 102-147. https://doi.org/10.1016/j.ijedudev.2019.102130

Bongiovanni, I., Renaud, K., & Cairns, G. (2020). Securing intellectual capital: an exploratory study in Australian universities. *Journal of Intellectual Capital*, 21(2), 481-505. https://doi.org/10.1108/JIC-08-2019-0197

Borboa-Álvarez, E. P., Valdez-Juárez, L. E., Limón-Ulloa, R., Hernández-Ponce, O. E., & Saucedo-Monarque, J. (2020). The role of responsible management in job satisfaction and performance within banking firms. *Journal of Business, Universidad Del Pacífico*, 12(1), 82-102. https://doi.org/10.21678/jb.2020.1429

Boric, S., Reichmann, G., & Schlögl, C. (2024). Possibilities for ranking business schools and considerations concerning the stability of such rankings. *Plos One*, 19(2), e0295334. https://doi.org/10.1371/journal.pone.0295334

Borsetto, E. (2021). European Business Schools: A content analysis of mission, vision and values. Department of Management, Università Ca'Foscari Venezia Working Paper, (1). https://doi.org/10.2139/ssrn.3794394

Bunkowski, L. T. (2019). Mission, Vision, and Core Values through Online Education. *Quarterly Review of Distance Education*, 20(4), 1-26.

Campbell, C., Gusto, C., & Diaz, J. (2023). Locally supported, values-based framework for a university foodservice program: Results of a Delphi study. *Journal of Agriculture, Food Systems, and Community Development*, 12(4), 135-149. https://doi.org/10.5304/jafscd.2023.124.006

Carvalho, L., Brandão, A., & Pinto, L. H. (2021). Understanding the importance of eWOM on higher education institutions' brand equity. *Journal of Marketing for Higher Education*, 31(2), 261-279. https://doi.org/10.1080/08841241.2020.1788196

Dass, S., Popli, S., Sarkar, A., Sarkar, J. G., & Vinay, M. (2021). Empirically examining the psychological mechanism of a loved and trusted business school brand. *Journal of Marketing for Higher Education*, 31(1), 23-40. https://doi.org/10.1080/08841241.2020.1742846

De Francisco, L. R., & Prada, J. F. M. (2019). Self-management, social entrepreneurship and social innovation: a content analysis of messages in Twitter. *Tec Empresarial*, 13(3), 42-57. https://doi.org/10.18845/te.v13i3.4208

Enders, A. M., & Lupton, R. N. (2021). Value extremity contributes to affective polarization in the US. *Political Science Research and Methods*, 9(4), 857-866. https://doi.org/10.1017/psrm.2020.27

Farhat, K., Mokhtar, S. S. M., & Salleh, S. B. M. (2021). Role of brand experience and brand affect in creating brand engagement: A case of higher education institutions (HEIs). *Journal of Marketing for Higher Education*, 31(1), 107-135. https://doi.org/10.1080/08841241.2020.1759753

Felix, B. (2020). Analyzing the formation of a paradoxical organizational identity. *International Journal of Organizational Analysis*, 28(6), 1227-1241. https://doi.org/10.1108/IJOA-08-2019-1849

Gadd, E. (2020). University rankings need a rethink. *Nature*, 587(7835), 523-524. https://doi.org/10.1038/d41586-020-03312-2

Gagnidze, I. (2018). From clusters to entrepreneurial universities and vice versa: ways of developing the local economy: a systemic approach. *International Journal of Markets and Business Systems*, 3(2), 181-196. https://doi.org/10.1504/IJMABS.2018.090515

Goydke, T. (2022). Business Schools and the Common Good's Approach to Sustainability in Higher Education. *International Journal of Vocational Education & Training*, 8(1).

Hales, R., & Phi, G. (2021). Curriculum Audits and Implications for Sustainable Development Goals Integration in Business Schools. *Journal of Business Ethics Education*, 18, 25-46. https://doi.org/10.5840/jbee2021183

Haski-Leventhal, D., Pournader, M., & Leigh, J. S. (2022). Responsible management education as socialization: Business students' values, attitudes and intentions. *Journal of Business Ethics*, 176(1), 17-35. https://doi.org/10.1007/s10551-020-04593-3

Hendriana, E., Awang, K. W., & Yusof, R. N. R. (2021). The roles of the country's cognitive, affective, and personality aspects in international students' decision-making. *Journal of Marketing for Higher Education*, 1-18.

Hogan, A., & Thompson, G. (Eds.). (2020). Privatization and commercialization in public education: How the public nature of schooling is changing. Routledge. https://doi.org/10.4324/9780429330025

Hsieh, H. J. (2021, July). Influence of Brand Core Value on Online Purchase Intention. In Proceedings of the 2021 12th International Conference on E-business, Management and Economics (pp. 69-74). https://doi.org/10.1145/3481127.3481182

Kaltenecker, E., & Okoye, K. (2024). How do location, accreditation, and faculty size affect business schools' ranking? *Journal of Education for Business*, 99(2), 96-102. https://doi.org/10.1080/08832323.2023.2268800

Kashif, M., & Cheewakrakokbit, P. (2018). Perceived service quality-loyalty path: A PAKSERV based investigation of international students enrolled in business schools in Thailand. *Journal of Marketing for Higher Education*, 28(1), 51-65. https://doi.org/10.1080/08841241.2017.1402113

Khan, H., Shah, K. A. M., Khalid, J., Harnmal, M. A. A., & Ali, A. J. (2020). Globalization and University Rankings: Consequences and Prospects. *International Journal of Higher Education*, 9(6), 190-199. https://doi.org/10.5430/ijhe.v9n6p190

Khoshtaria, T., Datuashvili, D., & Matin, A. (2020). The impact of brand equity dimensions on university reputation: an empirical study of Georgian higher education. *Journal of Marketing for Higher Education*, 30(2), 239-255. https://doi.org/10.1080/08841241.2020.1725955

Lim, M. A. (2021). The business of university rankings: The case of Times Higher Education. In Research Handbook on University Rankings (pp. 444-453). Edward Elgar Publishing. https://doi.org/10.4337/9781788974981.00044

Lozano, J. M., Bofarull, I., Waddock, S., & Prat-i-Pubill, Q. (2020). Avoiding the iron cage of business school rankings. *Higher Education Policy*, 33, 135-157. https://doi.org/10.1057/s41307-018-0107-7

Martin, A., Mott, M., & Watson, G. (2020). Core Values, Challenges, and Cultural Change: 50+ Years of Outward Bound New Zealand Courses. *Journal of Experiential Education*, 43(3), 248-261. https://doi.org/10.1177/1053825920910187

Mazurek, G., Korzynski, P., Gorska, A., & Palyga, A. (2020). Mission statements in FT ranked European business schools-a content analysis. *European Research Studies Journal*, 23(1), 639-649. https://doi.org/10.35808/ersj/1565

Mwatsika, C., Kambewa, P., & Chiwaula, L. (2018). Untangling the concept of entrepreneurship towards a common perspective. *African Journal of Business Management*, 12(14), 451-470. https://doi.org/10.5897/AJBM2018.8587

Nabil Ghobril, A., Baker, D., Rokop, N., & Carlson, C. R. (2020). Beyond Entrepreneurship Courses: Strategy, Structure and Processes at Illinois Tech to Become an Entrepreneurial University. *Revista de Empreendedorismo e Gestao de Pequenas Empresas*, 9(1). https://doi.org/10.14211/regepe.v9i1.1539

Peters, K., Smith, R. R., & Thomas, H. (2018). Rethinking the business models of business schools: A critical review and change agenda for the future. Emerald Publishing Limited. https://doi.org/10.1108/9781787548749

Quinteros, M. J., Sanchez, R., & Villena, M. G. (2020). How do business schools compete in Latin America? Stability and best predictors of success for the AmericaEconomia MBA Ranking. *Applied Economics*, 52(50), 5546-5563. https://doi.org/10.1080/00036846.2020.1765965

Ryu, J., Walls, J., & Seashore Louis, K. (2022). Caring leadership: The role of principals in producing caring school cultures. *Leadership and Policy in Schools*, 21(3), 585-602. https://doi.org/10.1080/15700763.2020.1811877

Shafaei, A., Nejati, M., & Maadad, N. (2019). Brand equity of academics: demystifying the process. *Journal of Marketing for Higher Education*, 29(1), 121-133. https://doi.org/10.1080/08841241.2019.1605438

Shapiro, G., & Markoff, J. (2020). A matter of definition. In Text analysis for the social sciences (pp. 9-32). Routledge. https://doi.org/10.4324/9781003064060-1

Siat, G. O. (2021). Acceptability and Perception of the Vision, Mission and Core Values of the Biliran Province State University. *Technium Social Sciences Journal*, 17, 63-68.

Siddiqui, K., & Ahmad, S. (2022). Demystifying the Core Values of Top Global Business Schools. Academy of Management Proceedings. https://doi.org/10.5465/AMBPP.2022.10457abstract

Siddiqui, K., & Ahmad, S. (2023), Dataset Core Values of Top Global Business Schools, Mendeley Data, V1, https://doi.org/10.5465/AMBPP.2022.10457abstract

Siddiqui, K., & Alaraifi, A. (2019). What they don't teach at entrepreneurship institutions? An assessment of 220 entrepreneurship undergraduate programs. *Journal of Entrepreneurship Education*, 22(6), 1-16.

Siddiqui, K., (2021). Debunking the Myths of Vision and Mission Statements: A Content Analysis of FT Ranked Top 100 Business Schools. Current Problems of the Corporate Sector 2021 SHS Web of Conferences, Bratislava, Slovak Republic. https://doi.org/10.1051/shsconf/202111503015

Simões, C. (2019). Organizational culture in higher education branding: Branding the core values and beliefs. In Strategic Brand Management in Higher Education (pp. 41-57). Routledge. https://doi.org/10.4324/9780429029301-3

Suárez-Barraza, M. F., Rodríguez-González, F. G., & Stanley Hart, H. (2019). Finding Kaizen core values in AACSB standards accreditation: a conceptual study. *Total Quality Management & Business Excellence*, 30(sup1), S53-S73. https://doi.org/10.1080/14783363.2019.1665793

Sull, D., Turconi, S., & Sull, C. (2020). When it comes to culture, does your company walk the talk? MIT Sloan Management Review.

Sziegat, H. (2021). The response of German business schools to international accreditation in global competition. *Quality Assurance in Education*, 29(2/3), 135-150. https://doi.org/10.1108/QAE-01-2020-0008

Tasel-Jurkovic, K., & Altinbasak-Farina, (2021). Higher education institution choice intention model: mediation effect of attitude. *Journal of Marketing for Higher Education*, 1-20. https://doi.org/10.1080/08841241.2021.1969489

Toker Gökçe, A. (2021). Core values in education from the perspective of future educators. *SAGE Open*, 11(2), 21582440211014485. https://doi.org/10.1177/21582440211014485

Waddock, S. (2020). Will businesses and business schools meet the grand challenges of the era? *Sustainability*, 12(15), 6083. https://doi.org/10.3390/su12156083

Wæraas, A. (2018). Putting on the velvet glove: The paradox of "soft" core values in "hard" organizations. *Administration & Society*, 50(1), 53-77. https://doi.org/10.1177/0095399715581471

Walkiewicz, J., Lay-Kumar, J., & Herzig, C. (2021). The integration of sustainability and externalities into the "corporate DNA": A practice-oriented approach. Corporate Governance: *The International Journal of Business in Society*, 21(3), 479-496. https://doi.org/10.1108/CG-06-2020-0244

Walter, N., Asgari, O., & Cleff, T. (2022). What role does the brand play? Measuring the impact of customer-based brand equity on the selection of MBA programs at Dutch business schools. *Journal of Marketing for Higher Education*, 1-23. https://doi.org/10.1080/08841241.2022.2048430

Wilkerson, E. A., & Evans, C. A. (2018). A content analysis of mission statements in non-profit education. *The Journal of Nonprofit Education and Leadership*, 8(1), 80-92 https://doi.org/10.18666/JNEL-2018-V8-I1-7321

Yao, Q., Martin, M. C., Yang, H.-Y., & Robson, S. (2019). Does diversity hurt students' feeling of oneness? A study of the relationships among social trust, university internal brand identification, and brand citizenship behaviors on diversifying university campuses. *Journal of Marketing for Higher Education*, 29(2), 209-229. https://doi.org/10.1080/08841241.2019.1638482

Yousaf, S., Fan, X., & Laber, F. (2020). Branding China through the internationalization of higher education sector: An international students' perspective from China. *Journal of Marketing for Higher Education*, 30(2), 161-179. https://doi.org/10.1080/08841241.2019.1710890

Author Contributions: The authors contributed equally. All authors have read and agreed to the published version of the manuscript.

Dr. Shabir AHMAD is an Assistant Professor at Al Yamamah University, Al Khobar, Kingdom of Saudi Arabia. Research interest include family-owned businesses, strategic management
ORCID ID: https://orcid.org/0000-0002-0523-6536

Dr. Ishtiaq Ahmed BAJWA is an Assistant Professor of Finance at Al Yamamah University, Saudi Arabia. Research interests: entrepreneurial finance, venture capital, and fin-tech.
ORCID ID: https://orcid.org/0000-0001-5296-0028

Dr. Faisal AFTAB is an Associate Professor of Strategic Management at the College of Business Administration, Imam Abdulrahman Bin Faisal University, Saudi Arabia. Research interests include strategy and HRM.
ORCID ID: https://orcid.org/0000-0001-8932-6178

Dr. Chaudhry Kashif MAHMOOD is a faculty member at the College of Business Administration, Imam Abdulrahman Bin Faisal University, Saudi Arabia. Research interests include digital marketing.
ORCID ID: https://orcid.org/0000-0002-5716-1011

Dr. Kamran SIDDIQUI is an Associate Professor of Marketing and Entrepreneurship at the College of Business Administration, Imam Abdulrahman Bin Faisal University, Saudi Arabia. Research interests: entrepreneurship, business incubators, and accelerators, entrepreneurial marketing, venture capital.
ORCID ID: https://orcid.org/0000-0002-5724-0991

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a9728395726

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

Publisher
http://jssidoi.org/esc/home

EMPATHY AS A DRIVER OF SOCIAL ENTREPRENEURSHIP: INSIGHTS FROM THE BULGARIAN CONTEXT*

Ana Todorova [1], Irina Kostadinova [2], Nataliya Venelinova [3]

[1,2,3] University of Ruse Angel Kanchev, Faculty of Business and Management, Ruse, Bulgaria

E-mails: [1] attodorova@uni-ruse.bg; [2] ikostadinova@uni-ruse.bg; [3] nvenelinova@uni-ruse.bg

Received 15 July 2024; accepted 12 October 2024; published 30 December 2024

Abstract. Social entrepreneurship, understudied as a business and social phenomenon, hides its potential, and what drives those involved in a social activity still needs to be clarified. The paper's authors assume that empathy is the basis of starting a socially significant business and seek confirmation of this thesis in direct communication with social entrepreneurs from Bulgaria. The research methodology is based on the author's conceptual framework, which includes two groups of results – quantitative and qualitative – that aim to confirm or reject the formulated hypotheses. The results show a positive relationship between empathy and starting a socially engaged business. The analysis identifies empathy as a vital catalyst for the social entrepreneur, along with communication skills, emotional intelligence, and critical thinking. The research shows that empathy is a prerequisite for starting a socially engaged business and can significantly contribute to the organisation's success. At the same time, there is a subjective conclusion that Bulgarian social entrepreneurs are not responsive enough, which may hinder social changes and the development of social enterprises in the country. Future research will explore that topic.

Keywords: social entrepreneurship; empathy; social activity; social economy

Reference to this paper should be made as follows: Todorova, A., Kostadinova, I., Venelinova, N. 2024. Empathy as a driver of social entrepreneurship: insights from the Bulgarian context. *Entrepreneurship and Sustainability Issues*, 12(2), 71-84. http://doi.org/10.9770/n4955682927

JEL Classifications: D91, L31

1. Introduction

Business and entrepreneurship are at the heart of progress and are associated with active citizenship, a continuous drive for action, and innovative and creative thinking. Undoubtedly, entrepreneurs are the driving force of innovation and progress, drivers of growth and competitiveness of any economy. At its core, entrepreneurship is creating and shaping the future. Entrepreneurs seek new combinations of scarce resources in the present, but their discoveries become a product of the future. The desired result of their activities and initiatives is profit and an increased standard of living (Pavlov & Ruskova, 2023).

Nevertheless, in recent years, ambitions to increase corporate profit or market share have been partially eclipsed by the drive to overcome acute world problems such as climate change, social inequality, poverty, infant mortality, illiteracy, and discrimination (Xiaobao et al., 2023). Today, there are various new spheres or forms

* *The research is supported by the Bulgarian Ministry of Education and Science under the National Program "Young Scientists and Postdoctoral Students – 2".This paper is financed by the European Union-NextGenerationEU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project №BG-RRP-2.013-0001-C01.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

of business – entrepreneurship in the digital sector, social entrepreneurship (SE), and eco-entrepreneurship. The commonality between them is that they seek and find solutions to current social, environmental, educational, and consumer problems (Lückenbach et al., 2023). In a broader sense, SE is defined as an economic activity aimed entirely at creating, functioning and developing social enterprises. It is related to the concept of a social economy, which is guided by the community's interests. Profit is not its primary goal but a means to achieve the main mission – universal well-being (OECD, n.d.).

On the other hand, Taylor (2023) argues that the core of a mentally balanced society lies in an individual's empathic connection, fostering characteristics like compassion, accountability, justice, equity, and parity. Conversely, a psychological state marked by excessive individualism and disconnection leads to self-centeredness devoid of empathy, compassion, and ethical awareness. Consequently, these features contribute to societal injustices, disparities, intolerance, harshness, and subjugation.

Similarly, Shepher et al. (2023) define empathy as a primary driver of SE and entrepreneurial action. Their research explains how empathy-driven entrepreneurial action manifests through creating and managing social enterprises. It is assumed that empathic entrepreneurs generally try to reduce the suffering of the defined target group by positively changing their lifestyle. This gives the researchers reasons to consider empathy as the core characteristic of social entrepreneurs and, as such, a vital antecedent of the social aspect of SE intentions.

The reason for emphasising empathy as a predictor of starting a social business, but not a traditional one, is that empathy allows people to identify social problems, understand the needs and wants of others, and develop innovative solutions to address those problems. In particular, empathy is described as an individual's ability to understand another person's emotions and the tendency to respond emotionally and systematically to their mental state. Large-scale studies show that people with higher levels of empathy are more likely to have a strong desire to positively impact society, which can motivate them to engage in social entrepreneurial activities (Duong, 2023).

The deepening global interest in SE and empathy and its supposed role in forming the social economy raises the question of whether this is also the primary trigger of Bulgarian social entrepreneurs. The present study's authors assume that such a discovery would answer how authentic and sincere the Bulgarian social initiators are in their social intentions. It would refute or deepen the widespread mistrust of the civil organisations that partially form the sector of social entrepreneurs in the country (Alpha Research, 2022). At the same time, it would lead to new aspects in improving the performance of SE and the socio-economic condition of Bulgaria.

The material is structured as follows: In the *Theoretical background* based on current research, the authors analyse the presence or absence of a relationship between empathy and entrepreneurs' social commitment. Based on the purpose of the study and the literature analysis, the main hypotheses of the research are formulated. The *Methodology* presents the conceptual model of the study and the way of forming the sample. In *Results and Discussion*, the obtained quantitative and qualitative data are analysed and interpreted, as well as the main limitations of the study and the applicability of the results. A *Conclusion* summarises the key findings.

2. Theoretical background

For decades, economies worldwide used the rising corporate profit and gross national product to measure national achievement. However, the well-being of a nation should not be measured solely by national income. Economic growth is synonymous with a nation's overall quality of life. Focused on people and the environment, armed with empathy and solidarity, a number of civic associations are alarming the outbreak of a crisis with a scale that threatens the existence of civilisations and the survival of species – a world of rapidly increasing inequality, the erosion of relationships of trust and care, and a culture that encourages greed and materialism (Helliwell et al., 2021).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

This has led to a new type of entrepreneurial wave – social entrepreneurship- combining business practices and tools with passion and empathy to solve pressing social problems. SE is a process in which a specific type of participant – social entrepreneurs – creates and develops organisations that can be social enterprises or other associations (Pavlov & Ruskova, 2023; Taylor, 2023). The Organization for Economic Cooperation and Development (OECD, n.d.) defines SE as any private activity carried out in the public interest, organised with an entrepreneurial strategy, the main objective of which is not profit maximisation but the achievement of specific economic and social goals and which can bring innovative solutions to the problems of social exclusion and unemployment.

The Bulgarian Law on Enterprises of the Social and Solidarity Economy (Lex bg, n.d.) defines the concepts of social and solidarity economy as a form of entrepreneurship aimed at one or more social activities and social goals carried out by enterprises, including through the production of various goods or the provision of services, in cooperation with state or local authorities or independently. The Law describes cooperatives, legal entities with a non-profit purpose for carrying out socially beneficial activities and social enterprises as the subject of the social economy. The stakeholders define this fact as a considerable step in clarifying the SE but think the regulation needs to be more comprehensive. The complete clarification of its essence proves impossible at this stage since the unknowns are more than the knowns (Stoyanova, 2021).

The lack of an appropriate legal structure, uniform standards and, above all, the freedom for each entrepreneur to define himself as "social" is a prerequisite for generating tension and mistrust around the activities of social initiators. Stress may also exist within the social enterprise due to the markedly dual nature of such organisations. Combining two seemingly mutually exclusive goals – the generation of social value, on the one hand, and economic value, on the other – is a prerequisite for ambiguities and deepening the misunderstanding of how social initiators should actually function. However, it is also a criterion for distinguishing traditional from social entrepreneurship (Saebi et al., 2019).

Empathy, on the other hand, is the ability and desire to be aware of and understand the feelings, thoughts and experiences of others. In its various forms, empathy includes caring for others and experiencing their emotions, and in broader definitions, it also encompasses more distant stakeholders and non-human entities, such as the environment or ecosystem. Several SE studies emphasise the importance of empathy as a motivator for pursuing socially meaningful goals. In this context, empathy is more of an emotional catalyst, evoking compassion and a desire to help someone in need (Korte et al., 2018).

Another similar study among Malaysian students revealed that university students were more socially oriented than traditional entrepreneurs (Pangriya, 2019). Education as a characteristic of the socially oriented person is advocated as an outcome in several studies analysed on the subject. That should not oppose the two business concepts – traditional and social, along the lines and degree of their education but should be seen as an opportunity for educational institutions to find their place in the process of forming the social economy by promoting the social commitment of entrepreneurs, improving and adapting the learning processes in the field of business education and entrepreneurship education (Kunev et al., 2020). However, in addition to education, Pangriya (2019) identifies emotional intelligence – which includes empathy as competence – and creativity as a more significant predictor of SE intention formation.

A 2018 study (Bacq & Alt, 2018) of 281 students participating in two different SE courses at a research university in the northeastern United States also identified empathy as a critical trait distinguishing social entrepreneurs from traditional entrepreneurs. It explained social initiative intentions through two complementary mechanisms: self-efficacy and social value. What is specific in this case is that he interviewed students who were studying rather than developing SE. The results are more likely to meet society's (respectively students') expectations of what social initiators should be as individuals, which is separate from the authentic personality traits of those engaged in social causes. Rauchbauer et al. (2023) also present evidence that empathy increases prosocial behaviour, charitable giving and willingness to help. Two aspects of empathy-related traits, namely empathic concern and perspective-taking, have been identified as particularly related to an individual's social and, in particular, prosocial behaviour. Empathic concern is an inherently other-oriented

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

emotional response to feeling for someone rather than feeling like the other, which is the dominant common claim. Motivates the improvement of the condition of the other without self-focus or desire to alleviate personal suffering. Empathic perspective-taking involves accessing and understanding another's particular needs or situations while recognising that they are different and separate from one's own. It also supports prosocial behaviour when it is realised that the other needs help or assistance.

Freeman's stakeholder theory is also in this context and postulates that to effectively address the problems related to the creation of values, ethics, and management, it is necessary to analyse the relationships with all groups that influence or are influenced by the business. Managing a company based on these principles implies a search for solutions that do not require a compromise between stakeholders' interests but strive for the satisfaction of all (Stojanović et al., 2021).

In a large-scale content analysis of speeches given by various social entrepreneurs at a 2018 social business conference organised by the Yunus Center and Yunus Social Business, Pangriya (2019) found that education, global exposure, previous work experience, creativity, empathy, community, roots, and satisfaction are the main characteristics of SE. According to the report's author, empathy and belonging to a particular community make social entrepreneurs different from traditional (business-oriented) entrepreneurs and conclude that empathy is a vital characteristic of social initiators. To become a successful social entrepreneur, one needs to understand the community and its problems and only then seek a solution to the issues identified. Through empathy, social entrepreneurs can ensure they stay connected to their community and their cause. At the same time, considering culture when debating entrepreneurial intentions and actions is vital because culture shapes people's values, beliefs, and behaviours about entrepreneurship. In addition, culture can enhance or hinder individuals from having entrepreneurial intentions or performing entrepreneurial actions in their societies, as it is considered one of the most important factors for entrepreneurs (Kayed et al., 2022).

At the same time, there are indications that social entrepreneurs' prosocial, altruistic motivations should not be taken for granted, as it risks viewing social entrepreneurs as well-intentioned ethical heroes driven by decency and morality. Indeed, quite a few social entrepreneurs may be motivated by benefits accruing to them personally, including personal pleasure, freedom, fame and recognition. In a qualitative study examining the motivations of budding social entrepreneurs, researchers found that personal enjoyment and achievement orientation were among the primary motivations for social entrepreneurs. A similar but quantitative study found a direct and positive relationship between the pursuit of status and SE and a negative relationship between empathy and the intention to initiate a social enterprise (Tucker et al., 2019).

As stated earlier, Bulgaria lacks a clear understanding of the concepts of SE and social enterprise (Glasnews BG, 2019). The only clear thing is that there are significant differences between traditional and social entrepreneurship (OECD, n.d.), which implies a difference in motivation between conventional and social entrepreneurs. The literature review shows that although there is a wealth of literature on the specific, non-financial characteristics that define SE, there is *significantly less understanding of the personality of the social entrepreneur and their personal motivation for starting a social enterprise or cause*.

Drawing on existing theory and empirical data generated from similar studies in other countries, the authors of the present research assume that a social entrepreneur is a person who combines business ingenuity with social commitment and empathy, seeks a balance between social and economic goals and strives to improve living conditions in society. Although there is also some debate about the precise definition of empathy, most scholars agree that it is a process oriented toward understanding and sharing the internal experience of another individual or group of individuals (Shepherd et al., 2023). Therefore, a central thesis in this research is that *an individual's empathy is critical to a social entrepreneur's motivation and effectiveness in meeting the needs of others*. Based on this, the authors put forward the following first research hypothesis:

H1: Empathy plays an essential role in the motivational profile of social entrepreneurs in Bulgaria, influencing their decisions to create, develop and manage social enterprises.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

Most researchers include empathy in the composition of an individual's emotional intelligence (Alabbasi et al., 2023) or soft skills (Galster et al., 2023). That provokes some questions: If empathy is the supposed motivator for social entrepreneurs, do they appreciate their team members' or partners' hard or soft skills more? Do social initiators prefer cooperating with people with similar motivators – empathy and compassion? Thus, the present study proposed the second hypothesis as follows:

H2: Social entrepreneurs in Bulgaria are more motivated to hire and partner with people who share their values and have developed soft skills than to look for people with high technical qualifications.

3. Research objective and methodology

The current research focuses on the role of empathy in initiating and managing a socially engaged business model. The methodology combines quantitative and qualitative data, aiming at the respondents' answers and confirming or rejecting the formulated hypotheses to fill in specific gaps regarding the personality of the social entrepreneur, the motivation for starting a socially significant business and the choice of employees and partners. The research covers the following stages:

1. Building a conceptual framework of the research methodology (Table 1.);
2. Selection of criteria for participation and surveying Bulgarian social entrepreneurs;
3. Analysis of the results, formulation of relevant conclusions and recommendations.

Table 1. Conceptual model of research methodology

№	Survey item	Justification
1	General and restrictive conditions	The survey is aimed at social entrepreneurs operating from or outside Bulgaria but registered as an organisation (company, cooperative, enterprise, non-government organisation, etc.) in Bulgaria. Study period April 12 – April 30 2022.
2	Purpose and tasks of the study	The purpose of the research is to establish the role of empathy in SE and how much it influences decision-making by setting: • what influence does empathy have on the motivation of social entrepreneurs; • how social entrepreneurs perceive empathy; • how crucial emotional and social competence (as soft skills and bearers of empathy) is for social initiators and their relationships with employees and partners.
3	Object of research	The object of research is Bulgarian social entrepreneurs.
4	Development of a questionnaire	The survey form is anonymous and was prepared with the Google Forms web application toolkit. The survey card contains 7 questions – 5 closed and 2 open-ended. The form contains 6 questions relevant to the purpose and tasks of the survey, and the last one allows the respondents if they wish to introduce themselves and the organisation they represent.
5	Approval of the survey card	The survey form has been tested by five experts, two of whom are social entrepreneurs. Recommendations were received for: • reducing questions; • building a better sequence of questions; • redundant explanatory texts have been removed; • adding a question *"Where do you think acts of empathy are more helpful?"*.
6	Formulation of the final survey card	After the testing, the number of questions was not changed because it is considered that the survey constructed in this way contains the necessary number of questions, guaranteeing the objectivity of the research. It was decided to present emotional and social competence in the context of the more widespread theory of soft and hard skills.
7	Data processing approach	Data processing was performed using Excel tools for mathematical and statistical functions.
8	Results analysis	The analysis is presented in the Results section.
9	Conclusions and recommendations	Summaries of the results have been made, and relevant conclusions have been formulated. Findings and recommendations are presented in the Discussion and Conclusions sections.

Source: Authors' development

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

In theory, the Law on Enterprises from the Social and Solidarity Economy in Bulgaria defines specific conditions for which enterprise falls within the scope of the normative act. However, the study "Social entrepreneurship in Bulgaria on the path of growth" (Valley of Growth, 2021) is indicative of the problem with (self-)determination and the legal framework of social enterprises and initiators, according to which the number of social enterprises in Bulgaria varies between 29 and 4,000 organisations, and according to National Statistical Institute, Bulgaria (NSI) data (CLSDP, 2024) – by 2021, 2,442 organisations have defined themselves as social entrepreneurs or enterprises. This is an impressive difference and an undeniable indicator that the country lacks clear, consistent, and comprehensive data on SE and what falls within its boundaries.

For this reason, the authors of the present study defined the specific criteria for selecting social enterprises and social entrepreneurs in the survey as an essential element of the methodology and the implementation of direct communication with self-identified social entrepreneurs and social enterprises in Bulgaria. The selection of social enterprises and entrepreneurs to participate in the research is based on three main criteria:

- registered and/or self-identified as a social entrepreneur/enterprise (according to the registers corresponding to the Ministry of Labor and Social Policy in Bulgaria and the National Statistical Institute, Bulgaria);
- the presence of a clearly expressed social mission in the organisation's representative website or social channels;
- reflected activity in the direction of realising the stated social goals of the organisation;
- combining the stated social mission with the development of actual economic activity.

Based on the described criteria, 150 active social entrepreneurs were identified. The sample is significantly smaller than those who self-identified as social entrepreneurs (2,442) but considerably higher than those officially registered (29) in the register of social enterprises in Bulgaria. Although with a population size of 2,442 (self-identified social entrepreneurs), the recommended sample size should be 333 (at a confidence level of 95% and a margin of error of 5%), the authors of the present study consider that precision has been achieved with these sample criteria, and the identified 150 entrepreneurs correspond to the maximum extent to the general definitions of SE proposed in the Theoretical Background.

These three criteria, in turn, are associated with three limitations:
1) the presence of a clearly expressed social mission in the representative channels of the organisation is not a guarantee that the latter can be defined as a social enterprise;
2) the reflected social activity is not an exhaustive criterion for a socially engaged company since it is not possible to follow, based on a preliminary selection, whether these are campaigns with short-term or long-term impact;
3) due to the adherence to the principles of anonymity and allowing the respondents not to publish their identifying data (such as personal names or the name of the organisation), it is not possible to restrict the filling in of the survey form by third parties that are not related to SE or do not fully meet the formulated criteria. However, the personalised communication approach chosen and implemented minimised the risk of the involvement of disinterested parties.

During the survey implementation, a personalisation effect was sought – a personal address to the relevant social entrepreneur to obtain an indirect answer to how responsive the respondents are. The survey was carried out by distributing the link for the survey form:

- through personal and personalised messages by e-mail and on social networks to social entrepreneurs (according to their professional business cards on LinkedIn, Facebook, and X);
- personal contacts with social entrepreneurs.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

4. Results and discussion

Of the 150 social entrepreneurs invited to participate in the study, 50 people (or 33% *response rate*) responded, which can be seen as a sign of a lack of empathy on the part of the socially engaged towards other people's causes. Although it is only partially correct to draw a general conclusion based on this data alone, the general impression is that social entrepreneurs express a weak readiness and willingness to participate in the research. It is also confirmed by the received feedback of the sent messages – only 7 (or 5% *response rate*) of 150 social entrepreneurs demonstrated interest in the research topic and the possible results and shared that they also have to do similar studies and rarely meet responsiveness among society.

When asked, "*Do you agree with the statement that 'soft' skills (critical thinking, teamwork, empathy, emotional intelligence) are more important than 'hard' skills (programming, business analysis, blockchain) to your success as social entrepreneurs?*", 28 (56%) of social entrepreneurs strongly indicated soft skills as more key, and for 22 (44%), they were equally important. None identified hard skills as significant.

The survey indicates that for the respondents, the diploma and the study's success are not among the leading criteria when hiring employees from those involved in SE. If more than one answer is possible to the question "*When hiring a new person to your team, are you most interested in...?*":

- 49 (98%) of the respondents define as more important: teamwork, emotional intelligence, social relationships, empathy, critical thinking;
- 22 (44%) of the respondents choose communication skills and teamwork;
- 14 (28%) indicate design, business analysis, and blockchain;
- 7 (14%) value practical experience;
- 1 (2%) social entrepreneur believes that the degree and success of the study as an indicator of the knowledge of the employees is essential;
- 1 (2%) respondent associates the diploma and the study's success with the candidate's persistence and tenacity. From this point of view, they are of interest to him in selecting personnel.

To the question, "*Empathy has been identified as a key competence. How much do you agree with this statement?*", 40 (80%), or slightly more than half of social entrepreneurs, strongly agree with the statement, 8 (16%) somewhat agree, and 2 (4%) have no opinion.

When asked, "*Where do you think Empathy is most helpful?*", 50 (100%) or all social entrepreneurs expressed that empathy is helpful in their personal and professional lives. The data shows that empathy in life and work is essential for social entrepreneurs. The claim that empathy is essential to the realisation of social causes is also reinforced by the respondents' open-ended opinions to the question *"Would you give an example of this skill [showing empathy] in your work?"* in the survey form.

In support of the formulated statement, a comment to the survey can be indicated, in which a respondent social entrepreneur shares that, in his opinion, SE is synonymous with empathy. Otherwise, it is not social but a scam masquerading as empathy. The statement is particularly telling since pure logic says it should be correct, but is it so in reality? If we go back to the number of people who participated in the survey, there is a slight disappointment in the lack of responsiveness among social entrepreneurs. That is the sector that most depends on the goodwill and responsiveness of society to realise its causes. Social enterprise could only realise its goals if it attracted a severe dose of citizen support. Confirmation of this statement can be found in two of the responses, according to which filling out the survey form is a form of empathy on the part of people since social entrepreneurs also constantly have to conduct surveys to apply for various projects. Socially engaged people see a manifestation of empathy in society when it helps them achieve their causes.

Unfortunately, most representatives of SE asked to participate in the survey clearly do not share this opinion and do not show responsiveness to a sufficient degree. Does this mean that many self-described social entrepreneurs lack this essential competency – empathy? Moreover, if we go by the definition put forward by

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

the anonymous respondent, that if there is no empathy, then "*entrepreneurship is not social, but a scam disguised as empathy*", can we conclude that a large part of the NGO sector and other forms of SE are a scam?

In support of this conclusion is another opinion of a respondent who defines himself as a social entrepreneur and states that he is a former participant in an NGO. He shares that he could not give an example of empathy, but he could provide an example of the lack of it. According to him, his NGO chose to apply for projects which were not considered in terms of how they could be helpful to society and bring about social change. The projects are selected according to the association's potential benefits, and the project's income is subsequently distributed as profit between the partners.

Of course, from one anonymous comment, one should not draw a definite conclusion about the nature of SE, but it opens up many questions for reflection. It also reveals one of the fundamental problems in S, namely the mistrust of society. The suspicion of the citizens is not entirely unfounded, as another social entrepreneur survey respondent, who wished to remain anonymous but would have liked the survey results to be published, pointed out. The participant preliminarily concludes that because he knows the sector in depth, the results will probably not be satisfactory and in favour of social entrepreneurs.

Another anonymous social entrepreneur's assessment of the fight against drug addiction sounds quite correct. According to him, if a person communicates poorly or does not feel emotions towards other people's pain, there is no way to become a social entrepreneur. The very choice to fight for specific social causes is an act of empathy, but it does not necessarily apply to all social entrepreneurs. The statement supplements his opinion that quite a few fictitious NGOs have entirely different incentives for their work. In this statement, the phrase *fictitious* NGOs makes an impression and gives food for thought. Is there a developed and active sector of social enterprises in Bulgaria, and isn't it wrong to equate every NGO, civil association, or civically active person to the group of social initiators? The lack of an adequate regulatory framework allows everyone to define themselves as social entrepreneurs and leave a negative imprint on the sector.

Despite the gloomy appearance, the definition of another social entrepreneur sounds interesting, according to whom compassion is a more precise and pleasant word and, from the point of view of the Bulgarian language [compassion = *съпричастен*], describes the meaning of this skill much more accurately:

"You accept to be a part of something outside of you – in their work, social entrepreneurs get to be a part of the pain of others and try to heal it to the best of their ability. Undoubtedly, this acceptance requires empathy, proving that true social entrepreneurship is an example of empathy."

The following short quote gives a complete picture of the role and importance of empathy in SE:

"All of our work with minority groups is the epitome of empathy; there is no other way to do this. It does not."

Social entrepreneurs themselves understand that their hallmark is authentic empathy. In their view, no other way or means would support their work with the target groups they seek to help.

"We solve people's problems – and many others do – but they are looking for material gain. We empathise with their problems and seek solutions that alleviate, not aggravate their current condition."

"I think empathy, in general, is what separates social entrepreneurs from the average. I do not mean that people in business are driven by self-interest; they probably feel empathy, too. The difference is that with us, every decision, every action, is the result of empathy."

"Our foundation works with troubled children or children who are victims of violence. Sometimes, we observe how the parents of these children accuse them, sometimes aloud, sometimes silently, of being problematic or weak physically and mentally. Would you probably blame the parents for their behaviour? We do not. Moreover,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

we believe that is what we owe to empathy. We do not blame anyone; we do not judge anyone; we try to help, even when we do not fully understand why a situation has happened."

Empathy is a catalyst or internal motivator for starting or participating in a social initiative, i.e. it is perceived as an emotional commitment to a specific target group. The following statements support what has been said:

"Empathy is at the heart of our motivation to fight for our cause."

"Empathy guides us in the search for initiatives that are within our power. Although they are visible at first glance and with the naked eye, it is not more important to know what you can be useful with and not just to get into something you do not have the strength and capacity."

In addition to empathy, social entrepreneurs also pay significant awareness to communication skills. That is confirmed both by the quantitative results of the conducted survey and by some of the freely expressed opinions among them:

"You cannot become a social entrepreneur if you are a bad communicator or insensitive to other people's pain. So, the fact that we choose to fight for some social causes (in our case, fighting drug addictions) manifests empathy. It does not necessarily apply to all social entrepreneurs; of course, we looked at fictitious NGOs with entirely different incentives in their work."

The many other comments in the survey deserve attention, but it is impossible to quote in full. The opinion of Polina Harizanova, executive coordinator of the Social Teahouse Foundation – Varna, Bulgaria, summarises them all. According to her, empathy in SE is a leading quality, and she adds that the principle of work of the foundation she manages is precisely that. The Social Teahouse helps young people deprived of parental care, and the team has realised that it is essential to show young people how important they are. For this reason, they perceive the people in the organisation and the young people they work with as a family united by the cause.
From the opinions received, the following points can be synthesised regarding the social initiators:

- to the greatest extent by empathy, they understand mutual help – whether to a stranger, a colleague or a relative;
- see empathy as a primary motivator for starting a social enterprise or NGO;
- they also liken it to social commitment and the desire to contribute to the good of society with every action;
- empathy for social initiators is also engagement with the problems of different social groups and active work towards their resolution;
- define empathy also as the ability to accept another's point of view and realistically conclude that they could not get support for everything from everyone and at all costs;
- associate empathy with non-judgment, overcoming fears and prejudices, and others.

From the freely expressed opinions of social entrepreneurs, it is clear that, although they perceive empathy differently, it is generally agreed that it is a motivating catalyst for starting and developing a social enterprise or engaging in a socially significant initiative. At the same time, 80% of the respondents strongly agree that empathy is crucial for success. The results confirm the research's first hypothesis (H1) that *empathy plays an essential role in the motivational profile of social entrepreneurs in Bulgaria, influencing their decisions to create, develop and manage social enterprises*.

The study unquestionably confirms the second hypothesis (H2) formulated in Section 2.3 – *Social entrepreneurs in Bulgaria are more motivated to hire and partner with people who share their values and have developed soft skills than to look for people with high technical qualifications*. More than half of respondents (56%) agree with the statement that soft skills, including empathy, critical thinking, and emotional intelligence, are more crucial to their success than hard skills. Almost 100% of survey respondents are much more interested in the soft skills of their potential employees, only 28% cite hard skills as necessary, and only 4% (or 2 respondents) consider a degree and academic success to be essential to the success of those involved in social causes.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

In summary, the research results strongly suggest that empathy is a motivator for starting socially engaged business initiatives. This is consistent with the findings of Korte et al. (2018), who read empathy as an emotional catalyst of socially oriented behaviour and attitude towards a person or group in need. The data confirm the claim of Shepher et al. (2023) on empathy as a core driver of SE. At the same time, the formulated generalisations correspond positively to what was expressed by Rauchbauer et al. (2023), who view empathy as a trigger for prosocial behaviour, charitable giving, and willingness to help.

The answers to both types of questions confirm that for socially engaged entrepreneurs, soft skills, including empathy, emotional intelligence, critical thinking, etc., are significantly more decisive for their relationships with customers and partners. This is consistent with Freeman's stakeholder theory – empathy, communication, and commitment to building positive relationships with all stakeholders and continuous adaptation to the changing environment are necessary for the success of any business, including socially engaged ones (Stojanović et al., 2021).

Limitations and Future Research

A problem in implementing the study is the formation of the sample since, as stated earlier, there needs to be a clear definition and a comprehensive list of social entrepreneurs in Bulgaria. The authors of a similar study in Belgium faced a similar problem, choosing to select social enterprises based on convenience sampling (Lambrechts et al., 2020). For the present study, the authors set a list of specific, measurable, and objective criteria for selecting respondents, but this does not guarantee the precision of the sample.

Another significant limitation of the study is the need for a basis for comparison. To date, there has yet to be data on a similar survey conducted in Bulgaria, and the latter makes it difficult to interpret the obtained results objectively and adds an element of subjectivity on the part of the authors. It is possible to conduct a similar study in another country or again in Bulgaria after a certain period and discuss how the attitudes of social entrepreneurs in Bulgaria have changed or be compared with social entrepreneurs from other countries.

With few exceptions, the studies cited in the Theoretical background, like the presented study among Bulgarian social entrepreneurs, share a common problem. By their very nature, they reflect societal assumptions, and the questionnaires are built around that. Society assumes that social entrepreneurs are motivated by empathy, and the survey questions are explicitly asked along these lines: *Do you think that empathy...? Empathy is considered a critical competency; how much do you agree?* Therefore, the interviewer sets the tone of the conversation, which can be considered incorrect to some extent. Although on the one hand, the authors of the report share the opinion expressed by the respondents that empathy is the essence of SE, and on the other hand, the quantitative and qualitative results confirm the hypotheses formulated in this sense, more in-depth studies and a targeted study of the personality of the social initiator are necessary, *ignoring the expectations of society*, including and researchers.

Part of the limitations of the survey among Bulgarian social entrepreneurs is the lack of information on the gender and age of the respondents. Some studies suggest that empathy is inherent to a much greater degree in women (Lambrechts et al., 2020), which is likely to change or enrich the results obtained. Nevertheless, the authors aim to study the general picture of SE in Bulgaria and its readiness to participate actively and effectively in developing its social economy. It is possible in future research to seek an answer to the question of whether gender and age influence the empathy and attitudes of entrepreneurs towards starting social initiatives.

The limitations of this study are a prerequisite for further research on the topic.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

Theoretical and practical implications

The research conducted regarding the motivations of social entrepreneurs is fundamental, at least from two perspectives. First, the need for a developed social economy of individual countries and socially engaged enterprises to solve local social problems is increasingly being discussed. Second, although this research does not aim to draw a line between social and traditional entrepreneurship, empathy and the presence of a clearly expressed social mission are vital characteristics of social enterprises. The latter, as knowledge, would make it possible to multiply the social catalyst in more than existing or newly created traditional startups, thus significantly supporting the development of an effective social economy.

At the same time, the study contributes significantly to the literature on SE and the main driving motives of social initiators, as it is one of the first academic studies on the subject in Bulgaria. The article enriches the accepted theoretical basis for social enterprises by finding correlations between the organisation's social mission, the individual's empathy and the socially significant initiatives he implemented.

The results suggest that individuals with developed empathy are more inclined to engage in socially entrepreneurial activities, which raises the question of the need for purposeful development of empathy in people from an early age. It is also essential to actively include the concepts of emotional and social competence, in the context of which empathy falls, in the educational programs of universities and the promotion of social entrepreneurial activities at the school or university level, similar to the Entrepreneurship Center of the University of Ruse Angel Kanchev, Bulgaria (Pavlov & Ruskova, 2023).

Kayed et al. (2022) argue that an individual, mainly a student, must have a solid background in entrepreneurship education to realise himself professionally and successfully as an entrepreneur. Therefore, university entrepreneurship education should include relevant courses and practical experiences to generate their intentions to become entrepreneurs positively. In addition, the present study highlights the need to teach not only economic and management disciplines closely related to entrepreneurship but also those aimed at developing social skills and empathy.

Conclusions

The present study represents the first in-depth study of the role of empathy as a motivational factor for Bulgarian social entrepreneurs. By analysing data from questionnaires with founders and representatives of social enterprises in Bulgaria, the authors identify the key role of empathy in the decision-making process, development of business models and interaction with stakeholders. Although these concepts are relatively well studied internationally, the current research provides data that supports their applicability in the specific Bulgarian context. Results complement the existing theoretical models of SE and provide valuable information for the development of policies and programs to support social enterprises in Bulgaria, such as training future social entrepreneurs in emotional intelligence skills, in the construct of which empathy is most often placed.

An essential conclusion of the present research is that the success of social initiatives and social change is directly dependent on the ability of social entrepreneurs to understand and regulate their emotions and build and develop their social communication based on empathy and mutual assistance. Success is unpredictable, and the turbulent and dynamic present mercilessly proves that rational intelligence alone is insufficient to solve severe conflicts, global crises, social problems, and business challenges.

The study shows that social entrepreneurs define empathy as an essential element for starting and developing a social initiative. For the respondents, empathy is, above all, engagement with the problems of different social groups and active work towards their resolution. To the greatest extent, social entrepreneurs, under empathy, understand mutual aid, social commitment, a motive to start a social enterprise or NGO, and the capacity to accept other people's opinions without judgment.

In addition, authentic empathy and responsiveness are required to accept another's position and opinion nonjudgmentally; self-awareness and motivation are required to outgrow the ego and stimulate prosocial behaviour. In this sense, it is imperative to cultivate the empathy and soft skills of the individual from an early age to talk about a modern, intelligent society oriented to solving social problems and not deepening crises.

References

Alabbasi, A., Alabbasi, F., AlSaleh, A., Alansari, A., & Sequeira, R. (2023). Emotional intelligence weakly predicts academic success in medical programs: a multilevel meta-analysis and systematic review. *BMC Medical Education*, 23(1), 425. http://doi.org/10.1186/s12909-023-04417-8

Alpha Research. (2022). *Obshtestveni naglasi kam deynostta na grazhdanskite organizatsii. Rezultati ot natsionalno predstavitelno prouchvane 2022 g. Balgarski tsentar za nestopansko pravo* [Public attitudes towards the activities of civil organizations. Results of a nationally representative survey 2022. Bulgarian Center for Non-Profit Law]. https://bcnl.org/uploadfiles/documents/0922_GO_Report(1).pdf Retrieved September 17, 2024

Bacq, S., & Alt, E. (2018). Feeling capable and valued: A prosocial perspective on the link between empathy and social entrepreneurial intentions. *Journal of Business Venturing*, 33(3), 333-350. https://doi.org/10.1016/j.jbusvent.2018.01.004

CLSDP (2024). *Report on the Draft Law on Amendments and Supplements to the Law on Enterprises of the Social and Solidarity Economy (Bulgaria)*, No. 49-454-01-4/01.02.2024. Committee on Labour, Social and Demographic Policy. https://www.parliament.bg/pub/plenary_documents/49-453-08-4_Doklad_KTSDP_1-o_ZID_ZPSSI.pdf Retrieved September 17, 2024

Duong, C. (2023). Karmic beliefs and social entrepreneurial intentions: A moderated mediation model of environmental complexity and empathy. *Journal of Open Innovation: Technology, Market, and Complexity*, 9(1), 100022. http://doi.org/10.1016/j.joitmc.2023.100022

Galster, M., Mitrovic, A., Malinen, S., Holland, J., & Peiris, P. (2023). Soft skills required from software professionals in New Zealand. *Information and Software Technology*, 160, 107232. http://doi.org/10.1016/j.infsof.2023.107232

GLASNEWS BG (2019). *Ilina Yakova, Sdruzhenie "Yuni Partners": Vazhno e da se dava poveche informatsiya za razvitieto na sotsialnoto predpriemachestvo* [Ilina Yakova, "Uni Partners" Association: It is important to give more information about the development of social entrepreneurship]. Retrieved September 17, 2024 from https://bit.ly/3rw9auK

Helliwell, J., Layard, R., Sachs, J., & Neve, J. (2021). *World Happiness Report 2021*. Published by Sustainable Development Solutions Network, New York; powered by the Gallup World Poll data. https://worldhappiness.report/ Retrieved September 17, 2024

Kayed, H., Al-Madadha, A., & Abualbasal, A. (2022). The Effect of Entrepreneurial Education and Culture on Entrepreneurial Intention. *Organizacija*, 55(1), 18-34. http://doi.org/10.2478/orga-2022-0002

Korte, R., Smith, K.A., & Li, C.Q. (2018). The Role of Empathy in Entrepreneurship: A Core Competency of the Entrepreneurial Mindset. *Advances in engineering education*, 7. https://files.eric.ed.gov/fulltext/EJ1199603.pdf Retrieved September 17, 2024

Kunev, S., Fleaca, B., Antonova D., & Dráb, R. (2020). Fostering the innovative university student-centred learning by application of ICT tools together with stakeholders: a project methodology overview. *7th International Conference on Energy Efficiency and Agricultural Engineering* (EE&AE), Ruse, Bulgaria, 1-4. http://doi.org/10.1109/EEAE-49144.2020.9279026

Lambrechts, W., Caniëls, M., Molderez, I., Venn, R., & Oorbeek, R. (2020). Unraveling the Role of Empathy and Critical Life Events as Triggers for Social Entrepreneurship. *Front. Psychol.* 11, 579500. http://doi.org/10.3389/fpsyg.2020.579500

Lex bg (n.d.). *Zakon za predpriyatiyata na sotsialnata i solidarnata ikonomika* [Law on enterprises of the social and solidarity economy]. https://www.lex.bg/bg/laws/-ldoc/2137187968 Retrieved September 17, 2024

Lückenbach, F., Schmidt, H.J., & Henseler, J. (2023). Building brand meaning in social entrepreneurship organizations: the social impact brand model. *Journal of Brand Management*, 30, 207-226. http://doi.org/10.1057/s41262-022-00299-1

OECD (n.d.) *Social entrepreneurship & Social enterprises*. Organisation for Economic Cooperation and Development. https://www.oecd.org/cfe/leed/social-economy/social-entrepreneur-ship.htm Retrieved September 17, 2024

Pangriya, R. (2019). Hidden aspects of social entrepreneurs' life: a content analysis. *Journal of Global Entrepreneurship Research*, 9, 66. http://doi.org/10.1186/s40497-019-0199-6

Pavlov, D., & Ruskova, S. (2023). The Role of Entrepreneurial Universities in Supporting Intergenerational Family Businesses. *International Journal of Euro-Mediterranean Studies*. 16(1), 51-72. https://emuni.si/ISSN/2232-6022/16.51-72.pdf Retrieved September 17, 2024

Rauchbauer, B., Jank, G., Dunbar, R., & Lamm, C. (2023). Differential associations of the two higher-order factors of mindfulness with trait empathy and the mediating role of emotional awareness, *Scientific Reports*, 13(1), 3201. http://doi.org/10.1038/s41598-023-30946-9

Saebi, T., Foss, N. J., & Linder, S. (2019). Social Entrepreneurship Research: Past Achievements and Future Promises. *Journal of Management*, 45(1), 70-95. http://doi.org/10.1177/0149206318793196

Shepherd, D., Seyb, S., & Williams, T. (2023). Empathy-driven entrepreneurial action: Well-being outcomes for entrepreneurs and target beneficiaries. *Journal of Business Venturing*, 38(2). http://doi.org/10.1016/j.jbusvent.2023.106290

Valley of Growth (2021). Social entrepreneurship in Bulgaria on the path of growth. https://bit.-ly/44rTWW0 Retrieved September 17, 2024

Stojanović, A., Mihajlović, I., Safronova, NB, Kunev, S., & Schulte, P. (2021). The multi-criteria analysis of corporate social responsibility: a comparative study of Russia, Bulgaria and Serbia. *Journal of Management & Organization*, 1-21. http://doi.org/10.1017/jmo.2020.40

Stoyanova, P. (2021). *Transformira li se sotsialnoto predpriyatie po vreme na kriza?* [Does social entrepreneurship transform in times of crisis?]. Investor.bg. https://www.-investor.bg/ikonomika-i-politika/332/a/transformira-li-se-socialnoto-predpriemachestvo-po-vreme-na-kriza-342719/ Retrieved September 17, 2024

Taylor, S. (2023). Toward a Utopian Society: From Disconnection and Disorder to Empathy and Harmony. *Journal of Humanistic Psychology*, 63(4), 537-560. http://doi.org/10.1177/00221678211025341

Tucker, R., Croom, R., & Bacq, S. (2019). Feeling your pain, pursuing my gain: Assessing status-striving, empathy, and social entrepreneurship intent. *Journal of Business Venturing Insights*, 12. http://doi.org/10.1016/j.jbvi.2019.e00142

Xiaobao, P., Hongyu, C., & Horsey, E. (2023). The predictive effect of relative intuition on social entrepreneurship orientation: How do exploratory and exploitative learning and personal identity interact? *Acta Psychologica*, 237. http://doi.org/10.1016/j.actpsy.2023.103951

Data Availability Statement: All data is provided in full in the results section of this paper.

Funding: The research is supported by the Bulgarian Ministry of Education and Science under the National Program "Young Scientists and Postdoctoral Students – 2".This paper is financed by the European Union-NextGenerationEU, through the National Recovery and Resilience Plan of the Republic of Bulgaria, project №BG-RRP-2.013-0001-C01.

Author Contributions: Conceptualization: *Ana Todorova*; methodology: *Ana Todorova*; data analysis: *Ana Todorova, Irina Kostadinova*, writing—original draft preparation: *Ana Todorova*, writing; review and editing: *Ana Todorova, Nataliya Venelinova*; visualization: *Ana Todorova*. All authors have read and agreed to the published version of the manuscript.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/n4955682927

Ana TODOROVA is a doctoral student in "Economics and Management" and a Young Researcher at the University of Ruse "Angel Kanchev" (Bulgaria). Research interests: digital entrepreneurship, marketing, information and communication technology, and sustainable business practices. She is also an entrepreneur with over 12 years of experience in e-commerce, digital marketing and web application development.
ORCID ID: https://orcid.org/0009-0007-2993-077X

Irina KOSTADINOVA is the PhD, Assoc. Prof., Department of Management and Social Activities, University of Ruse "Angel Kanchev", Ruse, Bulgaria. Research interests: risk management, business planning, corporate social responsibility, social innovation, digital business models, social affairs.
ORCID ID: https://orcid.org/0000-0001-8845-7598

Nataliya VENELINOVA is the PhD, Assoc. Prof., Department of Management and Social Activities, University of Ruse "Angel Kanchev", Ruse, Bulgaria. Research interests: strategic management, communication management, crisis management, emergency management and security, social affairs.
ORCID ID: https://orcid.org/0000-0002-7580-5263

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

Publisher
http://jssidoi.org/esc/home

CHALLENGES AND DRIVERS OF GREEN AND SUSTAINABLE SPATIAL DEVELOPMENT: A CASE STUDY OF LOWER SILESIA AND LATVIA

Katarzyna Miszczak [1], Anatolijs Krivins [2], Valters Kaze [3]

[1] Wroclaw University of Economics and Business, Wroclaw, Poland
[2] Daugavpils University, Daugavpils, Latvia
[3] RISEBA University of Applied Sciences, Riga, Latvia

E-mails:[1] Katarzyna.Miszczak@ue.wroc.pl; [2] anatolijs.krivins@du.lv; [3] valters.kaze@riseba.lv

Received 15 July 2024; accepted 14 October 2024; published 30 December 2024

Abstract. The article discusses sustainable spatial development in Lower Silesia and Latvia (NUTS 2 level for territorial units), paying attention to the integration of Sustainable Development Goals (SDGs) and strategies for future growth. In Poland, spatial development guidelines emphasise economic viability, competitiveness, innovation, and sustainability, focusing on cooperation between local governments. Legislative reforms prioritise sustainable development principles in spatial planning to address regional challenges comprehensively. Lower Silesia's diverse topography and urban centres are focal points for understanding local development strategies and climate change mitigation efforts. The sustainable development strategy in Latvia aims to enhance societal well-being, economic growth, environmental quality, and international recognition through long-term development objectives. Collaboration between urban and rural areas is crucial for Latvia's sustainable development, emphasising the optimal utilisation of resources and tourism promotion. The text stresses the importance of aligning economic activities with environmental preservation and promoting social engagement for sustainable development. The research highlights the significance of integrating environmental considerations, spatial planning, and societal engagement to achieve sustainable development and address regional disparities for further exploration and application of sustainable practices.

Keywords: spatial development; sustainable development; drivers; Lower Silesia; Poland; Latvia

Reference to this paper should be made as follows: Miszczak, K., Krivins, A., Kaze, V. 2024. Challenges and drivers of green and sustainable spatial development: a case study of Lower Silesia and Latvia. *Entrepreneurship and Sustainability Issues*, 12(2), 85-98. http://doi.org/10.9770/b7283449476

JEL Classifications: R12, R20, R58, Q01, Q56

1. Introduction

Sustainable development can be understood as a rule that enables the current generation to realise its development aspirations while securing the ability of future generations to meet their own needs (Brundtland, 1987). The idea of sustainability encompasses various elements that encourage regional growth, such as the anticipated increase in gross domestic product, augmented investment in research and development, decreased unemployment rates, heightened employment opportunities, poverty alleviation, elevated fertility rates, prioritisation of environmental concerns (including waste segregation, renewable energy sources, protected ecological areas), and the efficient operation of non-governmental organisations. Borys (2005) emphasises that sustainable development is a process of change that should exhibit the features of sustainability, positively assessed, at least on the basis of an anthropocentric set of values. The initial section of the study delves into theoretical considerations concerning sustainable spatial development, highlighting challenges posed by

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

underlying obstacles, sustainable development conceptual frameworks, the significance of innovation, the pivotal role of non-governmental organisations, and effective governance practices within regional contexts. Effective regional governance determines balancing economic progress, environmental sustainability and social well-being (Giorgetta, 2002). The analysis of the implementation of the sustainable development concept presented herein offers a comprehensive evaluation with a particular focus on select facets crucial to its successful realisation, the achievement of which significantly influences the overall implementation of sustainable development principles.

In this study, the authors define the term "Sustainable spatial development" as an improving organization of space to ensure long-term quality of life within a specific territory. Sustainable spatial development encompasses the dynamic process of facilitating effective hierarchical interaction and redistributing the functions of social, economic, ecological, innovative, and informational elements within living spaces to cater to the diverse needs of present and future generations sustainably. It is important to understand that achieving sustainability is not about striving for its absolute but balancing various development dimensions, such as spatial, ecological, economic, social, cultural and institutional (Kipane et al., 2023). Governance in sustainable spatial development entails activities undertaken by management entities to concretise spatial strategies that promote balanced socio-economic and environmentally sustainable development. The study aims to determine a theoretical and methodological basis for the analysis of sustainable spatial development processes (Pavlikha, 2006). The goal is to enhance the living standards of populations, ensure rational space utilisation, regulate natural resource use, protect the environment, maintain spatial system integrity, overcome regional disparities, promote urbanisation and rural development, and ensure spatial accessibility and safety. These actions aim to support the preservation of cultural heritage, expand access to information and knowledge, and increase energy security.

Additionally, responsible and intelligent spatial policies are based on sustainable development principles, reinforcing the significance of spatial planning in boosting sustainability (Zhang et al., 2024). By anchoring sustainable development in spatial policy, decisions made in local spatial planning are imbued with an axiological basis and serve as guiding principles in navigating conflicting interests and values. One of the crucial elements in integrating sustainability into mainstream practices is the incorporation of spatial thinking and territorial cohesion perspectives in the processes of planning, development, assessment, and monitoring. A region can be organised as a homeland for residents and their descendants by applying sustainability to spatial planning. The conceptual framework for sustainable spatial development hinges on the synergistic integration of social, economic (Remeikiene et al., 2022) and environmental dimensions, with spatial planning playing a vital role in steering socio-economic progress while safeguarding environmental resources. Moreover, ensuring holistic societal well-being requires balancing these pillars in sustainable spatial development (Szlávik et al., 2016; Pavlikha & Voichuk, 2018; Szlachetko, 2023).

The literature review shows that sustainable spatial development includes many different interrelated development drivers. However, the degree of research into these individual drivers varies. For example, factors such as transport, social sphere, and cultural heritage have been studied in more detail than environmental protection factors. Although the topic of green sustainable development of territories has increasingly appeared in scientific articles in recent years, these articles, as a rule, focus only on individual aspects, such as water quality or degraded territories. At the moment, the list of possible drivers that would allow for a comparative analysis of territories in an international context remains an unresolved issue. Therefore, in this article, the authors firstly focus on proposing a set of uniform and comparable drivers and, secondly, conduct a comparative study of these drivers in relation to two regions of the European Union - Latvia and Lower Silesia.

2. Strategic Approach for Spatial Sustainable Development

The modern strategy for sustainable spatial development is based on scientific and technical improvements driven by innovative resources, interdisciplinary research initiatives, localities engagement and a culture of creativity (Zieschank, 2004).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

Additionally, the inclusion of global climate change concerns in municipal development strategies can take various forms at different levels: 1) Micro and mezo (regional) levels may involve ongoing programs to reduce greenhouse gas and air pollutant emissions, improve air quality in health resorts and leisure municipalities, promote greening initiatives, and encourage pro-environmental business practices; 2) At the macro level, initiatives may include educational projects to enhance knowledge of global climate change and environmental awareness, targeting both children and adults. Other activities dedicated to reducing the harmful effects of human impact on the climate may include implementing innovative projects in consumption, logistics, housing and communication (Czaja & Rutkowska, 2023). Considering the above and the specificity of sustainable development, it becomes easier to gradually achieve the delicate balance between economic growth, social cohesion and environmental protection while taking advantage of growing opportunities and effectively minimising potential threats (Zieschank, 2004; D'Adamo & Gastaldi, 2023). In 2001, the Ministers overseeing Spatial Planning and Development in the Baltic Sea Region (BSR) countries ratified a revised Action Programme for the coming years. The BSR initiative addresses many of the challenges of spatial sustainability, including transport integration, promoting territorial diversification through smart specialisations, strengthening rural areas, and creating culture-based green networks (Zieschank, 2004). Human involvement is paramount across dimensions of sustainable development, emphasising the responsibility of meeting present and future needs. Sustainable spatial development aims to implement programs based on sustainable development principles through collaboration with local governments and community support.

On the other hand, sustainable development strives to meet the expectations of the current generation while optimising public welfare, environmental protection, and economic interests to ensure future generations' ability to satisfy their needs. The sustainable development strategy of Latvia, rooted in the analysis of global processes, addresses demographic changes, globalisation, labour market dynamics, climate change, energy security, emerging public participation forms, poverty risks, and urbanisation. The launch of sustainability in local spatial planning is of key significance, emphasising that local spatial development plans are essential tools for implementing spatial order and sustainable development principles set out in the relevant regulations (Szlávik et al., 2016; Raszkowski & Bartniczak, 2018; Szlachetko, 2023). One of Poland's most crucial legal bases regarding sustainability concerns is the "Sustainable Development Strategy for Poland up to 2025" (Polska 2025, 2000). While the strategy aims to initiate an extensive dialogue within Polish society regarding sustainable development, accessing the strategy, even online, may prove challenging.

Nevertheless, it enables entities to consider ecological challenges in social, economic, and infrastructure strategies (Nowicki, 2011; Raszkowski, 2013; Godlewska-Majkowska, 2014). Notably, Polish spatial planning law changes have focused on sustainable development as a fundamental principle, providing appropriate guidelines and conditions for land use (Miszczak, 2013). The legislative reforms of 2023 expanded the values considered in spatial planning to include sustainable development needs. The significance of local spatial planning in managing sustainable space is crucial in Poland's legal framework (VNR, 2023). The key spatial challenge is the insufficient coverage of spatial development plans throughout the country (Korenik et al., 2018; Wyszkowska & Rogalewska, 2016; Szlachetko, 2023).

3. Research methodology

This study uses a descriptive method as well as a content analysis method. This combination allows for a more comprehensive study of the problem of sustainable development (drivers and challenges) in two regions of Europe. In the first stage, the authors, based on a literature review and an analysis of already available studies, model a set of the most important comparable drivers for assessing sustainable spatial development and comparative analysis of the regions of the European Union. In the second stage, the authors test the performance of this model by applying it to two specific regions - Lower Silesia and Latvia.

The more variables are used in constructing a model, the more accurate and adequate the model is expected to be; however, with an increase in the number of factors (variables) used, the computational complexity increases, and the interpretability of the model decreases. The authors draw attention to the fact that not all available data

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

will be useful - the data may contain redundant and insignificant (irrelevant) features that can be removed without significant loss of information and deterioration in the quality of the model.

Therefore, when solving the methodological problem of selecting the necessary factors (variables for constructing an analytical model), the authors focused on identifying a subset of the data set that ensures the best quality of the model. Firstly, the variables selected by the authors are quantitatively measurable. Secondly, these variables contain only the most significant features from the point of view of the problematic of the article.

4. Results and discussion

Characteristics of Spatial Sustainability in Lower Silesian Voivodship

The Lower Silesia, situated in the southwestern part of Poland and sharing borders with the Czech Republic and the Federal Republic of Germany, closely mirrors the geographical boundaries of the Lower Silesian Voivodeship. Morphologically, the region consists of mountainous areas, highlands, lowlands and intermountain valleys. The excerpt underscores the urgency of formulating a deliberate settlement strategy for the Lower Silesia region. It visualises Poland's progress towards achieving Sustainable Development Goals (SDGs) through selected drivers that monitor the country's national sustainable development priorities.

The spatial development guidelines for Lower Silesian Voivodeship aim to manage spatial resources efficiently. The region aspires to be economically attractive, socially responsible, environmentally future-oriented, and innovative governance, focusing on sustainable development and creative management (Miszczak, 2020). The administration prioritises public service, resource management, stability, safety, community support, health, and vitality. It emphasises cooperation between local governments to address regional issues and strengthen synergy between Wroclaw (the region's capital) and the surrounding area. Therefore, it is worth taking a closer look at the complex processes and mechanisms of the functioning of local communities and the evolution of local government in Poland (Czaja & Rutkowska, 2023).

Given that urban sprawl is most prominent in highly populated, rapidly developing regions experiencing significant economic growth in Europe, Lower Silesia, a leading Polish region, was chosen as the focal point for investigation. The growing challenges related to proper spatial planning have concerned both urbanised and rural areas, especially those surrounding the main urban centres of Lower Silesia (Kulczyk-Dynowska & Stacherzak, 2022). An undoubted challenge resulting from the analysis of 250 Local Development Strategies in Lower Silesian communes from 2016-2022 (Czaja & Rutkowska, 2023) is a need to implement the concept of sustainable development, emphasising long-term growth (including the promotion of eco-business) and growing involvement in environmental protection (including limiting local air pollution, reducing greenhouse gases, greening municipalities as much as possible and promoting ecological educational projects). The conducted research (Czaja & Rutkowska, 2023) revealed shortcomings in local information policy, significantly hindering the voivodeship in correctly understanding and addressing the effects of global climate change and responsible spatial planning. That's why, according to the Development Strategy of Lower Silesian Voivodeship 2020, the following directions for intervention dedicated to spatial sustainability improvement should be undertaken (Figure 1).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

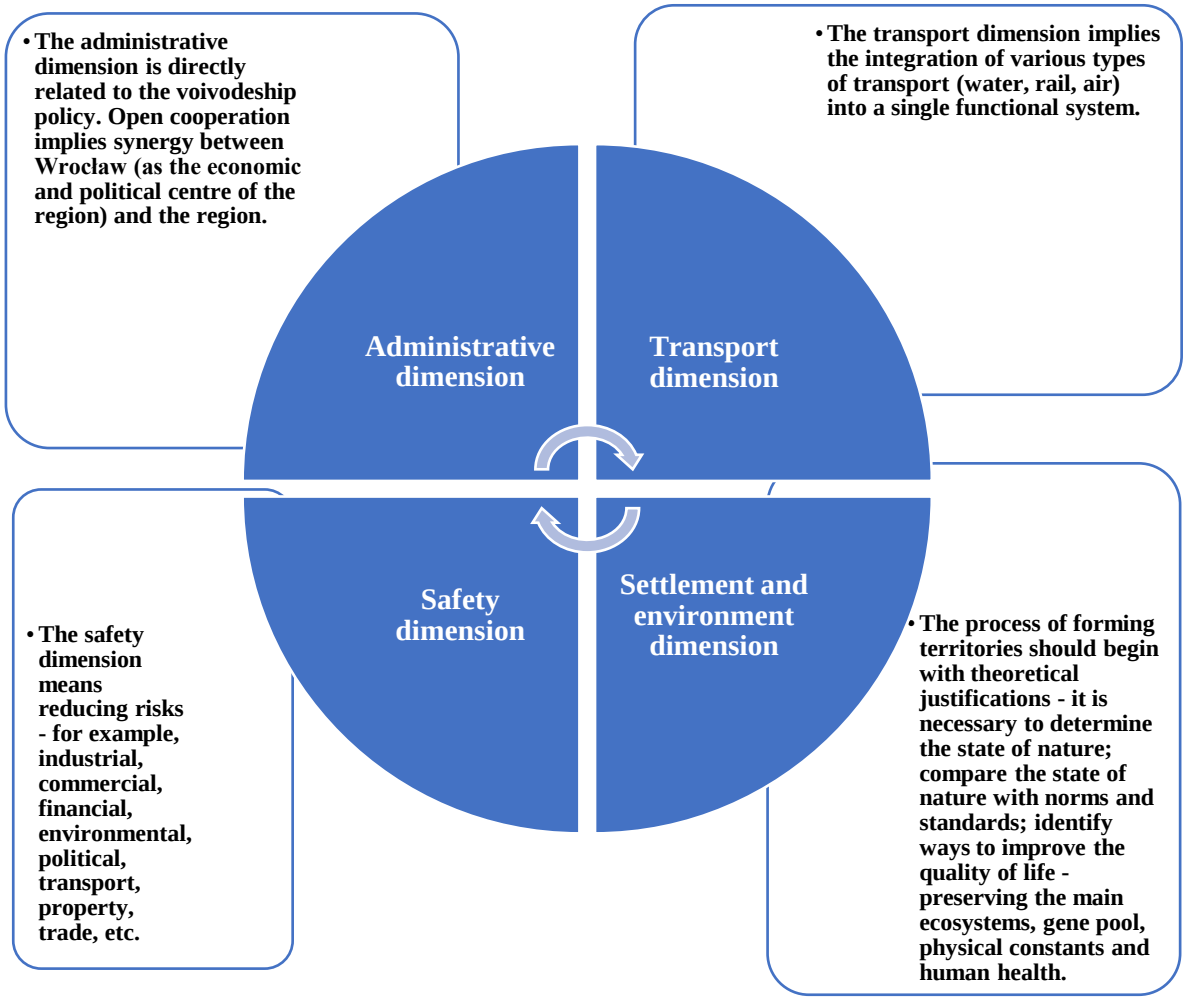


Figure 1. Main dimensions of Lower Silesian spatial sustainability
Source: authors created based on *the Development Strategy of Lower Silesian Voivodeship 2020*

It should also be emphasised that sustainable consumption significantly impacts the implementation of spatial sustainability in each of the four dimensions described above. Sustainable consumption as a driver of development involves using goods and services that meet current needs while ensuring the availability of resources for future generations. This challenge requires a conscious and responsible approach to minimise environmental impact and improve well-being. Moreover, in light of a growing need for a more precise conceptualisation of sustainable development due to various emerging issues, this consumption model fits the best. Sustainable spatial development involves a dynamic process of ensuring effective hierarchical interaction and changing the concentration of functions within living spaces to meet the various needs of current and subsequent generations. Sustainable communities are where people desire to live and work now and in the future. Sustainable planning aims to ensure sustainable development and management of the built environment, focusing on trade-offs between different dimensions of sustainability. The concept of sustainability balances the needs of internalisation and glocalisation, shifting towards fulfilling its long-term goals (Pavlikha & Voichuk, 2018; D'Adamo & Gastaldi, 2023). From the point of view of sustainable development, however, it is crucial not only to grasp spatial planning goals properly but also to implement them consistently, leading to achieving the assumed effects. Various drivers help assess the impact of the sustainability policy. Creating multiple sets of drivers of spatial sustainable development is very common. Particular attention is paid to the sustainable development of strongly urbanised areas, especially cities and suburbs. The overarching objective of these activities is to develop methods and tools supporting the creation of a high-quality living environment

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

in cities and to inhibit the adverse phenomena of urban growth and degradation of old housing estates and post-industrial areas (Fogel & Fogel, 2007).

The spatial sustainability of the Lower Silesian voivodship was characterised using spatial planning instruments, such as a synthetic drivers of land use under the principles of sustainable development, for which twelve basic measures were adopted (see Table 1):

MEASURE	LOWER SILESIA	POLAND
Share of protected areas in the total area [%]	18,6	32,2
Share of green areas in the total area [%]	0,83	0,59
Total green area per capita [m^2]	57,7	49,2
Share of degraded areas in the total area [%]	0,107	0,025
Number of inhabitants per km^2 of built-up and urbanised area	1908	2061
Communes that carried out revitalisation activities based on Municipal Revitalisation Programs or Public Relations completed in the reporting year for which interventions in the spatial-functional area dominate	77	732
Total revitalisation area [ha]	41 314	1 082 083
The area of revitalised brownfield areas (including post-industrial, post-railway) [ha]	2,45	36,12
Revitalisation area - residential areas, including accompanying service and communication areas in the city [ha]	9 212	174 444
Revitalisation area - residential areas, including accompanying service and communication areas in the countryside [ha]	26 873	629 512
Revitalisation area - uninhabited built-up areas [ha]	2 993	85 956
Revitalisation area – other uninhabited areas [ha]	1 101	163 077

Table 1. Land use under the principles of sustainable development in Lower Silesia in 2022
Source: authors created based on *Statistics Poland, 2022*

As the above analysis shows, Lower Silesia, one of the most urbanised regions of Poland, is characterised by a smaller share of protected areas in the total area of the voivodeship than the national average. In contrast, this proportion is reversed in the case of degraded areas. Such challenges require appropriate actions undertaken by local government authorities in spatial development policy, primarily since the region is distinguished nationally by more remarkable greening and intensity of land use. Local authorities and communities seem to be aware of this fact, as evidenced by the number of almost half of Lower Silesian municipalities (45%) that carried out revitalisation activities in the spatial-functional area based on Municipal Revitalisation Programs or Public Relations in 2022. For comparison, the percentage of municipalities undertaking revitalisation interventions in this area across the country was only 29% in 2022. Similarly, the share of revitalisation areas in the voivodeship area was more than twice as high (7%) as the share of these areas in the total area of Poland (3%). At the same time, the uninhabited but built-up areas of Lower Silesia were more subject to revitalisation activities (0.5% of the region's area, national average of 0.2%) than other uninhabited areas (0.1% of the region's area, national average of 0.5%).

On the other hand, in the urban-rural dimension, in the Lower Silesian voivodeship, as in the whole of Poland, a larger area of rural areas is subject to revitalisation interventions (4% of the voivodeship's area, in Poland 2%) than the urban revitalised area (1% of the voivodeship's area, in Poland 0.5%). An additional argument proving the above-average commitment of the Lower Silesian local government authorities to improving spatial sustainability is the higher than national average share of revitalised brownfield areas. This driver results from the specificity of the spatial-functional structure of the region, which is covered with a dense network of railway lines requiring immediate modernisation and (post)industrial character, especially two of the five subregions of Lower Silesia, i.e. the Wałbrzych subregion and the Legnica-Głogów subregion.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

Characteristics of Spatial Sustainability in Latvia

The Republic of Latvia borders with Estonia, Lithuania, Russia and Belarus. Currently, forests occupy 3.4 million hectares in Latvia, covering 53% of the country's territory. Statistics on the distribution of land by land use types on January 1, 2024 (Statistics, 2024) show that the total area of Latvia is 6448976 ha, including agricultural land 2251137 ha, forests 3147484 ha, scrubland 102380 ha, swamps 208763 ha, land of water objects 271748 ha, land under for buildings and yards 105716 ha, land under roads 143779 ha and other land 217969 ha.

According to the data of the Official Statistics Portal (OSP, 2024), in 2020, there were 69 thousand economically active farms in Latvia, which managed 1.97 million ha of agricultural land, or 30.5% of Latvia's territory. In 2020, farms managed 1.21 million ha of owned areas, or 61.7% of the total managed agricultural land, while the rest of the managed areas were leased from other farmers. Over the past 10 years, the distribution of farms by economic size groups has changed - in 2020, small farms accounted for 85.2% of the total number of farms, which is 6.3 percentage points less than in 2010, which is a significant challenge for the entire land use system. Small farms managed only 22.7% of the total agricultural land area, which is 20.4 percentage points less than in 2010. Large farms managed 870.7 thousand ha, or 68.2% of the sown area, as well as 91.8 thousand ha or 16.3% of the used meadows and pastures, were managed in large farms.

In comparison with Poland, Latvia demonstrates a relatively good situation in terms of the ecological drivers of the territory (see Table 2).

Country	**Latvia**	**Poland**
Renewable Energy: % of Gross Final Energy Consumption	37,20	11,30
Green Areas: Forest Area (% of Total Land)	53,97%	30,81%
Green Areas: Forest Area (m^2) per Capita	17.045	2.485
Government Support: € per Capita	107,59	25,48
Pollution: Greenhouse Gas Emissions (t per Capita)	6,00	10,50
Municipal Waste Generated (kg per Capita)	6,00	307
Waste Management: Incineration / Energy Recovery	0	56
Waste Management: Material Recycling	62	85
Waste Management: Composting and Digestion	42	21
Waste Management: Sustainable Recycling (%)	25,37%	52,77%
Organic Agriculture: Share of Organic Agricultural Areas	13,42	3,72

Table 2. Comparison of "Eco-Costly" drivers in Latvia and Poland, 2023
Source: authors created based on *Greenmatch, 2023*

The differences in the mentioned drivers are mainly related to the size of the countries, population, as well as the history, geography and economy of these countries. In Latvia, environmental quality (On Pollution, 2001) shall be determined in comparison with the desirable quality of air, surface water, underground water, soil, and subterranean depths or quality of other environmental components for the provision of which the environmental quality requirements expressed in quantitative indicators shall be determined. In this context, special attention should be paid to the challenges in the energy sector, which are more relevant for Poland than for Latvia. In the power structure of Latvia's generating sources, more than half of the electricity comes from hydroelectric power plants. In turn, in Poland, whose energy sector is still 70% coal-based, three times more CO2 must be emitted to produce 1 kilowatt-hour of electricity than the European average.

By analyzing the challenges and environmental policy guidelines for 2021-2027 (EPG, 2022), we can draw attention to the following aspects. The annual runoff of Latvian rivers is 34.7 km3, but only about 44% of the total runoff is formed in the territory of the country. The pollution that enters Latvia from Lithuania, Belarus and Russia covers all groups of pollutants, especially biogenic elements, affecting the quality of waters in the Gulf of Riga and the Baltic Sea. In the context of environmental noise pollution, two main impact indicators have been identified - the impact on public health and the impact on the possibilities of using the territory. Until now, no comprehensive studies have been conducted in Latvia on the impact of noise on public health. However,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

taking into account the fact that the extent of the impact is inextricably linked to drivers and indicators of the state of the environment, it must be concluded that the impact of noise on the health of the population of Latvia has increased over the past 10 years. Taking into account that the country has set limits for the permissible level of environmental noise pollution in certain built-up areas, such an increase in the level of noise pollution, as a result of which the limit values of noise in certain areas are exceeded, creates a practical challenge - restrictions on the possibility of using the affected areas. To characterize the state of the environment, data from the noise strategic maps are used, which are updated every 5 years for the Riga agglomeration and the main objects of the national transport infrastructure, evaluating the dynamics of the population and the area of the territory exposed to increased noise levels.

Low concentrations of sulfur dioxide and carbon oxide in the atmosphere have been observed for a long time in Latvia. On the other hand, the concentration of other acidifying substances, as well as particulate benzene and ground-level ozone in the environment, is characterized by significant territorial differences. The concentrations of all the above-mentioned substances, except ozone, outside the large cities where air quality monitoring is carried out (Liepāja, Rēzekne, Riga, Ventspils) remain at a low level, but in urban areas, air quality regulations for the protection of human health and the upper pollution assessment threshold are often found to be exceeded.

The results of ozone monitoring show the opposite results; in this case, increased concentrations were observed directly at rural observation stations, where exceedances of the target values for the protection of human health and vegetation were recorded. With the exception of ozone pollution, other state drivers characterizing the impact on ecosystems (concentrations of sulfur dioxide and nitrogen dioxide) indicate a low level of pollution in rural areas. Taking into account that the situation in the field of climate change is characterized by the modern challenge - the concentration of greenhouse gases in the atmosphere, which is not measured separately in the territory of Latvia, in order to characterize the manifestations of climate change in Latvia, primary impact drivers are used. Impact trends are considered over a longer period because when evaluating data for a shorter period, it is impossible to objectively assess trends.

One of the most important challenges in the context of spatial development in Latvia is currently the revitalization of degraded areas. Brownfield, in this article, means a place (land, buildings, real estate) that was previously used or built on but is currently abandoned or underutilized. It can be a place that is abandoned (a territory whose productive use no longer takes place for a considerable period of time), abandoned (a territory that industrial or other activities have damaged to such an extent that it is impossible to start its beneficial use without special restoration measures) or polluted (a territory, where a polluting activity has occurred or is still ongoing). This place can also be partially inhabited or otherwise used (territory in part of which economic activity or other beneficial use takes place).

It is a whole complex of challenges, which includes such risks as the expansion of construction in natural areas that does not comply with the principles of sustainable development; anthropogenic load, soil, water and air pollution, construction of green areas; insufficient physical and aesthetic quality of construction; non-compliance of production and technical infrastructure with environmental requirements; losses in the economy, due to inefficient use of the territory.

Degraded territories (brownfield) in Latvia consist mainly of inefficiently used production territories and the construction of warehouses, also in the port area; former army territories (activity in them: production, warehouses, workshops); residential construction - buildings in emergency condition; former landfills – contaminated sites; abandoned or inefficiently used transport infrastructure areas; areas of small gardens are extensively used.

Degraded areas can have a negative cumulative effect on the surroundings (RSC, 2004), and both the area and the local community can be harmed. On the other hand, the revitalization of degraded areas has a positive effect on the flow of investments and the business environment. In essence, the general goal of the revitalization of brownfields is to promote the country's sustainable development: to eliminate brownfields as much as possible and thus promote the regeneration process of the urban environment. This includes solving environmental

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

challenges, increasing the economic efficiency of the use of territories, improving the visual and structural-functional quality of the environment, and humanizing elements of the social environment.

Significantly, the criteria that influence business decisions are conceptually consistent with the criteria for determining brownfield sites, such as drivers of the economic efficiency of the territory - population, nature sites, number of companies; legal status of the territory - permitted use, limitations, obligations; presence of infrastructure and quality of engineering communications; access options; construction intensity and area size; placement opportunities of interrelated companies; compatibility and mutual influence of the use of adjacent territories; environmental condition and level of pollution; public opinion and attitude.

The history of degraded areas in Latvia and Poland is relatively similar. Most of these territories in Latvia occurred after the collapse of the Soviet system. Their decisive conditions are related to the transition to the market economy (Krivins, 2019) and, as a result, a radical change in the production field. Former heavy industry territories and their service engineering infrastructure abandoned military areas and residential areas around them, and the buildings that started today are still unfinished. At the same time, Latvia's scales are significantly smaller than Poland's. In addition, there are no large areas in Latvia which are dominated by a single industry, such as the coal industry or metalworking, so large, continuous, degraded areas have not developed.

The conditions of prolonged existence of degraded areas may vary. The main reasons for the existence of degraded territories in Western European countries are related to population decline, economic downturn, and corruption (Kriviņš & Vilks, 2013; Krivins, 2014; Teivāns-Treinovskis et al., 2022; Krivins et al., 2023), decrease in land market value, decline the availability of green areas. Of course, the effective use of the degraded area cannot be resumed without targeted intervention (recovery, renovation, infrastructure arrangement, spatial planning measures, investment (Kastratović et al., 2024), land consolidation and significant investment in its reconstruction).

It should be noted that there is still monocentric development in Latvia, which focuses on the capital of the capital (Riga). Although research into areas degraded in Western Europe has been carried out on the concepts of revitalisation and practical projects in the restoration of territories since the mid-20th century, this aspect has been relatively little scientifically studied in Latvia. One of the first planning documents in which special attention was paid to the study and renovation of degraded areas was the new development plan of Riga. Even today, the most crucial revitalisation projects are implemented primarily in Riga.

For example, according to the SJSC "State Real Estate" data (SRE, 2023), it is planned to complete several projects in 2024 when degraded areas turn into creative, educational and innovative locations, including the project "The Center for Education, Culture and Creative Industries - "TAB FAB "(ERDF funding of EUR 5.1 million without VAT) as well as the project "Riga Makerspace" (total construction costs of EUR 9.4 million with VAT). These and many other revitalisation projects related to the renovation of buildings confirm that the actual volume and complexity of the work to be done only after the start of the work, so it is very difficult to predict the exact completion of these projects. Revitalising the degraded areas owned by municipalities and transforming them into attractive and sustainably used ones is challenging. In Latvia, restored areas where the historical heritage and modern, sustainable solutions alternate are returned to society.

The biodiversity, development and availability of parks, forests and greenery in Riga is cared for by LTD “Riga Forests”, with 62,000 ha of forests, 399 ha of parks and 125 greenery objects (RF, 2022). Riga Forests also cares for the Culture and Recreation Park "Mežaparks" (385ha). In 2021, Riga Gardens and Parks, in cooperation with neighbourhood associations, participated in the project initiated by the Latvian Nature Fund, "City Meadow", preparing the soil for installing 20 meadows. In 2022, this initiative was continued, and 10 natural meadows were created. Riga residents are relatively optimistic about air and water quality, green areas, parks and other drivers (Numbeo, 2022), which affects the city pollution - in 2022, out of 5577 cities, Riga was ranked 63rd. There are many natural areas in Riga, but in most cases, their location in the city is fragmented (Riga City Council, 2022). It is necessary to combine these areas into a single structure of biological centres,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

urban environmental green centres, and the green band adjacent to the city, connecting the water areas to the green corridors and trails.

Directly to discuss and solve the challenges of the capital, on November 15, 2022, the Focus Group was held (Riga City Council, 2022), whose main insights are as follows: 1) Covid-19 pandemic and restrictions showed the importance of a public outdoor role. A green, pleasant, outdoor space must be near the residence; The neighbourhoods must become self-sufficient - there is a place in each neighbourhood where people can relax and where they can walk from their place of residence; 2) green zones (not always parks) and their creation is also essential for adaptation to climate change; 3) Special attention should be paid to the waterfront, the residence should be developed at the water, their availability and diverse functionality (improvement); 4) It is essential to focus on the improvement of the courtyards, opening for public use, such as creating courage passages - making the yards multifunctional people would feel safer; 5) A quality natural environment improves both urban aesthetics as well as emotional and physical health. The connectivity of the green areas (green trails, corridors, water edges) makes it more enjoyable and promotes an active lifestyle for recreation and daily mobility of the feet and bike.

These aspects are closely related to improving the emotional well-being and life quality of the local population through the facilitation of a biophilic approach to urban development and design. There are numerous studies (e.g., Bowler et al., 2010; Scopelliti et al., 2019; Gaekwad et al., 2022) that confirm the positive impact of the nature, quality and aesthetically appealing environment on the population, including a positive effect on productivity. This aspect is indirectly confirmed by human values studies in Latvia using Motival technology (Kaže et al., 2022) – the value profile of the Latvian population is highly exposed towards the domain of Caring and Tolerant values that include high importance of values related to caring about the environment and being in harmony with nature, respectively. The economic impact of the revitalisation is not currently much researched; however, not only does the productivity of the local population have a positive impact, but it might also help to grow the income from inbound tourism, attracting visitors with similar values to the local population. (Kaže et al., 2011)

5. Conclusions

The situation regarding the use of the country's territory in the current development conditions is rapidly changing, and the most crucial driver for development could be the revitalisation of degraded areas in the twentieth century. This issue should be seen in the context of the following factors: 1) European Union policy and potential support for a sustainable urban environment; 2) the context of economic development and the speed of change; 3) Tourism promotion - an increase in the number of tourists that require appropriate infrastructure and attractive environment for accommodation and service; 3) Reducing the risk of poverty, as the degraded living environment is, to a certain extent, the physical expression of social challenges; 4) Solving the challenge of transport, as if the mobility and business mobility of the population is increased by promoting traffic, the functional organization of an inappropriate area may enhance the pollution of the area.

To respond to these challenges, the most important steps may be: 1) a detailed and comprehensive assessment of the situation, which includes gathering information on the degraded areas in the country - including property affiliation, topography, existing and permitted use, level of pollution, building intensity, etc.; 2) determination of the causes of new degraded areas; 3) development of possible development scenarios and models; (4) the establishment of the database of degraded areas - this database must be publicly accessible and qualitatively maintained to provide the country with up-to-date information on processes in the use of the territory and justification for decision-making; 5) proactive national planning and definition of priorities in the revitalization of degraded areas.

Of course, these tasks are challenging. Degraded areas are characterized by diversity (different dislocation, authorized use, contamination risks, engineering communications, engineering quality, etc.). This fact makes the methodological category of territories; second, the potential costs of restoring the area have a significant impact; third, it has a significant impact on the types of intervention.

The public sector - the government and municipalities must act for the restoration of degraded areas, but the available resources limit their actions, which is an important current challenge. Although Latvia has implemented a number of revitalization projects with the European Union Structural Funds funding after joining the European Union, other types of cooperation, such as public and private sector cooperation, should be used more actively, in addition to the public sector support and private sector resources and knowledge, the renewal of degraded areas may be delayed, which can have a long-term negative effect.

In the context of the article, the number of degraded areas and their long-term existence indicate that private investment is inadequate to fully restore them effectively and quickly. For example, in Latvia, these areas are currently being renovated fragmented. This indicates that the revitalization of the degraded areas also requires public sector support and planned measures to increase the efficiency of resource use, as private businesses refrain from activities in the recovery of the environment if the area is not commercially beneficial.

The ineffective use of the area undoubtedly has a negative impact on the national economy. Concluding, it seems evident that the European Union's guidelines for the sustainable development of cities and regions should be referred to in the spatial planning systems of the Member States. In the case of Poland, this adjustment is half-hearted. The spatial development policy of the voivodships is mainly focuses on one driver - limited to planning the location of public purpose investments of supra-local importance. On the other hand, at the local level, large cities (including urban agglomerations and metropolises) are treated the same way as other municipalities. However, their complexity and the scope of generated external impacts significantly exceed their administrative boundaries (Mierzejewska, 2011). An optimistic accent is the recent change in legal regulations in spatial planning, which allows us to expect that sustainable development in the spatial aspect will be an objective reality in Poland soon. Entering the path of sustainable development in this respect will also require greater awareness of the impact of additional drivers - of the planning and development entities of the impact of the shaped spatial structures on the possibilities of implementing the principle of sustainable development and greater responsibility for the common good, social interest and future generations.

References

Borys, T. (2005). *Indicators for sustainable development – Polish experiences*, Warszawa-Białystok.

Bowler, D.E., Buyung-Ali, L.M., Knight, T.M., & Pullin, A.S. (2010). A systematic review of evidence for the added benefits to health of exposure to natural environments. *BMC Public Health*, 10, 456. https://doi.org/10.1186/1471-2458-10-456

Brundtland, G.H. (1987). *Our Common Future*. Report of the World Commission on Environment and Development. Geneva, UN-Dokument A/42/427. http://www.un-documents.net/ocf-ov.htm

Czaja, S., & Rutkowska, M. (2023). Ecological and climatic challenges facing documents of local development strategies (on the example of Lower Silesian municipalities in Poland). *Economics and Environment*, 86(3), 366-381. https://doi.org/10.34659/eis.2023.86.3.580

D'Adamo, I., & Gastaldi, M. (2023). Perspectives and challenges on sustainability: Drivers, opportunities and policy implications in universities. *Sustainability*, 15(4), 35-64. https://doi.org/10.3390/su15043564

EPG (2022). Environmental Policy Guidelines. Order of the Cabinet of Ministers of 31 August 2022 583 "On Environmental Policy Guidelines 2021-2027". Published: Latvijas Vēstnesis, 172, 06.09.2022. OP Number: 2022/172.3 https://likumi.lv/ta/id/335137-par-vides-politikas-pamatnostadnem-2021-2027-gadam

Fogel, A., & Fogel P. (2007). Możliwość wykorzystania europejskich wskaźników zrównoważonego rozwoju w planowaniu przestrzennym na szczeblu lokalnym, [in:] Waloryzacja środowiska przyrodniczego w planowaniu przestrzennym, M. Kistowski, B. Korwel-Lejkowska (eds.). Gdańsk – Warszawa, 129-131.

Gaekwad, J.S, Sal Moslehian, A, Roös, P.B., Walker, A.A. (2022). Meta-Analysis of Emotional Evidence for the Biophilia Hypothesis and Implications for Biophilic Design. *Front Psychol.*, 13, 750245. http://doi.org/10.3389/fpsyg.2022.750245

Giorgetta, S. (2002). The Right to a Healthy Environment, Human Rights and Sustainable Development. *International Environmental Agreements: Politics, Law and Economics*, 2, 173-194.

Godlewska-Majkowska, H. (2014). *Regional Investment Attractiveness 2014*, Warsaw, Polish Information and Foreign Investment Agency at the Institute of Enterprise, Warsaw School of Economics, 66-71.

Greenmatch. (2023). Which Country in the EU Is the Most Eco-Costly? 31.01.2023. https://www.greenmatch.co.uk/blog/2018/07/top-eco-costly-countries-in-eu#green-areas

Kastratović, R., Krivins, A., & Veikša, I. (2024). Economic and legal aspects of foreign direct investment patterns in Serbia and Latvia. Access to science, business, innovation in the digital economy, *ACCESS Press*, 5(3), 440-458, https://doi.org/10.46656/access.2024.5.3(4)

Kaže, V., Škapars, R., Ščeulovs, D. (2011). Development of Rural Tourism in Latvia Capitalizing on Regionally Relevant Human Values. *Management Theory and Studies for Rural Business and Infrastructure Development*, 26, 97-104.

Kaže, V., Bolinskis, G., & Kurovs, J. (2022). An Image-Based Approach to Measuring Human Values. *Societies*, 12, 191. https://doi.org/10.3390/soc12060191

Kipane A., Vilks A., & Krivins A. (2023). Forecasts of Long-term Progress in the Socio-cultural Sphere in the Context of Combating Economic Crime. *Pakistan Journal of Criminology*, 15(4), 49-67.

Korenik, S., Miszczak, K., & Rogowska, M. (2018). Shaping Spatial Structures of Lower Silesia Region on the Background of Global Changes. W J. Slavík & L. Povolná (Eds.), *Social and Economic Development & Regional Policy. Adaptation of Post-Industrial Society to Global Changes: conference proceedings* (47–54). Faculty of Social and Economic Studies Jan Evangelista Purkyně University in Usti nad Labem.

Krivins A., Vilks A., & Kipane A. (2023). Corruption perception trends: European Union countries. *Access Journal (Access to Science, Business, Innovation in the Digital Economy)*, 5(1), 58-67. http://doi.org/10.46656/access.2024.5.1(4)

Kriviņš A., Vilks A. (2013) Prevention of corruption in public procurement: importance of general legal principles. *Jurisprudence*, 20(1), 257-269.

Krivins, A. (2014). Prevention of corruption in the sphere of public purchases: Interviews with experts. 4th International Interdisciplinary Scientific Conference SOCIETY, HEALTH, WELFARE. SHS Web of Conferences, 10, 00018, 1-6. http://dx.doi.org/10.1051/shsconf/20141000018

Krivins, A. (2019). Legislative framework of in-house procurement. 7th International Interdisciplinary Scientific Conference SOCIETY. HEALTH. WELFARE. SHS Web of Conferences 68 01026, 1.-10. https://doi.org/10.1051/shsconf/20196801026

Kulczyk-Dynowska, A., & Stacherzak, A. (2022). The impact of a city on its environment: The prism of demography and selected environmental and technical aspects based on the case of major lower silesian cities. *Sustainability*, 14(11), 63-93. https://doi.org/10.3390/su14116393

Law "On Pollution" (2001). Publication: Latvijas Vēstnesis, 51, 29.03.2001.; Reporter of the Saeima and Cabinet of Ministers of the Republic of Latvia, 9, 03.05.2001. Section 12.

Mierzejewska, L. (2011). Rozwój aglomeracji a proces planowania przestrzennego, [in:] Podstawowe idee i koncepcje w geografii. Ujęcia i problemy badawcze we współczesnej geografii, W. Maik, K. Rembowska, A. Suliborski (Eds.). Wyższa Szkoła Gospodarki w Bydgoszczy, Bydgoszcz, 123-136.

Miszczak, K. (2013). Contemporary spatial planning and case of Poland. Prace Naukowe Uniwersytetu Ekonomicznego we Wrocławiu, 104-116.

Miszczak, K. (2020). Opportunities and threats for regional development in contemporary socio-economic space. Biblioteka Regionalisty, 90–108. https://doi.org/10.15611/br.2020.1.08

Nowicki, M. (2011). *The investment attractiveness of the regions and the sub-regions of Poland*, Gdańsk, The Gdańsk Institute for Market Economics, 43-60.

Numbeo (2022). Pollution in Latvia. https://www.numbeo.com/pollution/country_result.jsp?country=Latvia

OSP (2024). Official Statistics Portal. Number of agricultural holdings, utilised agricultural area and standard output by economic size and statistical region https://data.stat.gov.lv/pxweb/en/OSP_OD/OSP_OD__skait_apsek__visp__laukskait_10/LSK10-I10.px/

Pavlikha, N.V. (2006). Management of sustainable development of spatial systems: theory, methodology, experience: monograph. Lutsk: Volyn. obl. Druk, Ukraine.

Pavlikha, N., & Voichuk, M. (2018). CONCEPTUAL basis of sustainable spatial development: THEORETICAL and practical framework. *International Journal of New Economics and Social Sciences*, 8(2), 200–201. https://doi.org/10.5604/01.3001.0012.9945

Pawlonka, C. (2018). Społeczne aspekty zrównoważonego rozwoju. *Rynek-Społeczeństwo-Kultura*, 4(30), 28-31. https://kwartalnikrsk.pl/Artykuły/RSK-4-2018/RSK-4-2018-Pawlonka-Spoleczne-aspekty-zrownowazonego-rozwoju.pdf

Polska 2025 (2000). Governmental Centre for Strategic Studies in co-operation with Ministry of Environment "Polska 2025 - Long Term Development Strategy for Poland up to 2025", Warsaw (available only in Polish)

Raszkowski, A. (2013). Selected aspects of investment attractiveness of regions. *ACC Journal*, 2(B), 116-126.

Raszkowski, A., & Bartniczak, B. (2018). Towards Sustainable Regional Development: Economy, Society, Environment, Good Governance Based on the Example of Polish Regions. *Transformations in Business & Economics*, Vol. 17, No 2 (44), 225-245.

Remeikiene, R., Gaspareniene, L., Fedajev, A., Raistenskis, E. & Krivins, A. (2022). Links between crime and economic development: EU classification. *Equilibrium. Quarterly Journal of Economics and Economic Policy,* 17(4), 909-938. https://doi.org/10.24136/eq.2022.031

RF (2022). LTD "Riga Forests". In the first half of 2022, the turnover of Riga Forests exceeded EUR 10.9 million; increased production and maintenance costs. 02.09.2022. https://rigasmezi.lv/jaunumi/2022gada-pirmaja-pusgada-rigas-mezu-apgrozijums-parsniedza-109-miljonus-eiro-pieaugusas-razosanas-un-uzturesanas-izmaksas

Riga City Council (2022). Overview of Riga Sustainable Development Strategy until 2030 and Riga Development Programs 2022-2027. Implementation of the year. Riga, 2022. Riga City Council City Development Department. https://sus.lv/sites/default/files/media/faili/Parskats_2022.pdf

RSC (2004). Riga City Council, City Development Department, research work Degraded areas in Riga, report, LTD "Group 93", Riga, 2004

Scopelliti M., Carrus G., & Bonaiuto M. (2019). Is it really nature that restores people? A comparison with historical sites with high restorative potential. *Front. Psychol.,* 9, 2742. https://doi.org/10.3389/fpsyg.2018.02742

SRE (2023). SJSC "State Real Estate". Revitalisation is complex and challenging, but there is space for sustainable solutions. 18.09.2023 https://www.vni.lv/aktualitates/vni-vides-revitalizacija-ir-sarezgits-un-izaicinoss-uzdevums-tacu-lauj-izmantot-ilgtspejigus-risinajumus-#

Statistics (2024). Land division in land use (unit of measure - hectares). Data on 01.01.2024. https://www.vzd.gov.lv/lv/zemes-sadalijums-zemes-lietosanas-veidos?utm_source=https%3A%2F%2Fwww.google.lv%2F

Statistics Poland https://stat.gov.pl/en/

Szlachetko, K. (2023). The sustainable development and local spatial planning. Case study of Poland. *International Journal of Legal and Social Order*, 3(1). https://doi.org/10.55516/ijlso.v3i1.118

Szlávik, J., Csáfor, H., & Sebestyén Szép, T. (2016). Regional level of sustainability – two hungarian case studies. *Periodica Polytechnica Social and Management Sciences*, *24*(2), 136–148. https://doi.org/10.3311/ppso.7803

Teivāns-Treinovskis, J., Jefimovs, N., Velika, R. & Kriviņš, A. (2022). Conditions for application of criminal liability to the board of a company in the legal system of the Republic of Latvia. *Entrepreneurship and Sustainability Issues*, 9(4*)*, 45-55. http://doi.org/10.9770/jesi.2022.9.4(2)

VNR 2023 Poland https://www.gov.pl/web/rozwoj-technologia/monitoring-realizacji-agendy-2030

Wyszkowska, D., & Rogalewska, A. (2016). Indicators of green economy for Poland and other European Union countries. *Statistical News*, 665(10), 54-74. https://doi.org/10.5604/01.3001.0014.1109

Zhang, S., Kong, D., & Komal, B. (2024). Sustainable energy and environmental sustainability in selected Asia Pacific Economic Cooperation countries. *Gondwana Research*, 127, 65-76. https://doi.org/10.1016/j.gr.2023.03.024

Zieschank, R. (2004). Poland Case Study Analysis of National Strategies for Sustainable Development https://sdgtoolkit.org/wp-content/uploads/2017/03/Poland-Case-Study-Analysis-of-National-Strategies-for-Sustainable-Development-.pdf

Author Contributions: The authors contributed equally. All authors have read and agreed to the published version of the manuscript.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b7283449476

Katarzyna MISZCZAK is a Dr.hab., Associate Professor of Department of Spatial Economy and Local Government Administration at Wroclaw University of Economics and Business, Poland. Research Interests: regional and urban development, spatial planning, clusters, smart cities, networking, innovations and technology transfer, creative sector and intelligence specialization, urban and regional resilience concepts, learning organizations, globalization processes in modern territory.
ORCID: https://orcid.org/0000-0001-6158-9339

Anatolijs KRIVINS is PhD in Law (Dr.iur.), Associate Professor at the Faculty of Law, Management Science, and Economics at Daugavpils University, Latvia. Research interests: artificial intelligence, cyber security, corruption, and fraud prevention, governance, public sector.
ORCID ID: https://orcid.org/0000-0003-1764-4091

Valters KAZE is PhD in Economics (Dr.oec.), Associate Professor at RISEBA University of Applied Sciences, Latvia. Research interests: digital transformation, artificial intelligence, consumer behaviour and motivation.
ORCID ID: https://orcid.org/0000-0003-1502-6994

Copyright © 2024 by the author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

Publisher
http://jssidoi.org/esc/home

THE FUTURE OF UNIVERSITY EDUCATION – IS THE HEYDAY OF BLENDED LEARNING PROCESS COMING? *

Tsvetana Stoyanova [1], Kiril Anguelov [2]

[1] *University of National and World Economy, 8 Dekemvri Str, 1700 Sofia, Bulgaria*
[2] *Technical University of Sofia, 8 Kliment Ohridski Blvd, 1000 Sofia, Bulgaria*

E-mails: [1] *tsvetana.stoyanova@unwe.bg*; [2] *ang@tu-sofia.bg*

Received 14 June 2024; accepted 14 October 2024; published 30 December 2024

Abstract. The aim of the current study is to understand the opinion and attitude of students and university professors about the quality of the learning process of these three forms of education – traditional, online and blended/ hybrid and in general their attitude of using new technologies in learning process of the universities. We conducted an empirical study (n=427) among university professors (31) and university students (396). Our findings reveal that students and university professors express preference for blended/hybrid type of education, comparing to traditional face-to-face or online education. 47% of respondents prefer blended/ hybrid learning over traditional (41%) or online (12%). Blended/ hybrid learning process receives the largest acceptance for the following advantages: personal attention from the professors; improved communication and flexibility and convenience. At the same time, 66% of respondents are convinced that new technologies have positive (31%) and even very positive (35%) impact on their motivation to learn. This result clearly proves the need for deeper integration of the new technologies in the educational process in universities.

Keywords: blended learning; online education; hybrid education; higher education institutes; digitalization

Reference to this paper should be made as follows: Stoyanova, T., Anguelov, K. 2024. The future of university education – is the heyday of blended learning process coming? *Entrepreneurship and Sustainability Issues*, 12(2), 99-116. http://doi.org/10.9770/w4662779545

JEL Classifications: I0, I21, I23

1. Introduction

The customs and habits of young people (predominantly representatives of Generation Z) who are now in the university's courses confront universities with several very serious challenges. First of all – how to be more visible for them – terms such as reputation, long-lasting educational traditions, classical learning are not as important to today's students as they were to their predecessors 5-10 years ago. This fact forces universities to develop and actively maintain their profiles on social media. Secondly, once this attention is caught, to secure the proper choice of young people - by providing university sites with chatbots (available 24/7 at the disposal of potential students, parents, relatives, etc.) or a complete online procedure for submission documents and admission of students in Bachelor, Master and Doctoral Degrees), etc. Thirdly, to stay attractive for young people during their active years of university education - including by using all possible solutions of new technologies, providing modern educational content, focusing on new technologies, a mixture of individual and group assignments, different cases from practice, etc. In this line of consideration, especially in post-COVID-19 times, the form of education (traditional, online or hybrid) comes to the agenda. Even at first

* *The present article is published with the financial support of the Bulgarian Science Fund, KP-06-H 45/7 as of 08.12.2020.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

glance, all educational forms have strengths and weaknesses. Traditional education brings direct communication between lecturer and audience, which is important for the quality of the education. At the same time, it does not allow any high level of flexibility, especially when it comes to scheduling (which is important for the workload at present days).

On the other hand, online education and lessons provide sufficient flexibility and adaptability for both professors and students. Here, the main weakness is the lack of direct communication, again for lecturers and students. A hybrid form of education, however, could combine the strengths of traditional and online education and, at the same time – overcome, to some degree, their major weaknesses.

The current study aims to understand the opinions and attitudes of students and university professors about the quality of the learning process of these three forms of education – traditional, online and blended/ hybrid and, in general, their attitude toward using new technologies in the learning process of the universities. Based on the analysis of the collected responses, we understand their preferences, and with this information, we propose some ideas and recommendations for improvement of the quality of the educational process in universities, considering the opinion of the main stakeholders.

2. Literature review

The COVID-19 and post-pandemic years have created favourable circumstances for many researchers devoted to the digital transformation of the education system, some of them – directly focusing on the specifics of tertiary education. Therefore, there is now a sufficient number of studies exploring different aspects of digital change in the educational process in recent years.

For instance, Hossain et al. (2021) conducted research devoted to the assessment of online education and its reflection on the fear of academic delay during the pandemic years among university students in Bangladesh. They reported that approximately 60% of the students exhibited high levels of fear of academic delay and experienced significant stress. The results of a quality study conducted by Bruggeman et al. (2022) have revealed a broad spectrum of lecturers' perceptions about online education imposed during the pandemic – from fear and different levels of stress on one side to enthusiasm on the other. They have outlined several critical points in online education – connection with students and colleagues, digital learning process – opportunities but also threats, transformation of the role of university professor, time pressure and different kinds of support.

Alania-Contreras et al. (2024) focus on the evolution of students' opinions on the acceptance of online education in Peru. They registered a very weak positive acceptance trend. According to them, in the initial and intermediate phases of research, they observed a predominantly weak negative attitude, largely stemming from the institution's lack of experience and inadequate digital infrastructure. However, by the final stage, this attitude shifted to a mildly positive one as the institution adapted to the new circumstances and recognized the necessity of online education (ibid). Generally, the majority of students accept the online education process, especially in force majeure circumstances (Muthuprasad, Aiswarya, Aditya, Jha, 2021), but at the same time, express their preference for the traditional face-to-face learning process (Aguilera-Hermida, 2020). In this regard comes the research of Madani, Adhikari and Hodgdon (2024), who claim that students tend to appreciate online learning when they believe it enhances their learning outcomes and performance (performance expectancy) and when they perceive e-learning tools as user-friendly (effort expectancy). Authors reveal that, unlike faculty members, students are also significantly influenced by social factors, such as peer pressure and perceived status (social influence), in their acceptance of online learning.

Moreover, the shift in classroom dynamics, particularly changes in the power relationship between professors and students in the online teaching environment, is less of a concern for students than for faculty (ibid). At the same time, Angelova (2020) reveals that students perceive the quality of online lectures to be equivalent to that of traditional face-to-face lectures. However, opinions on the intensity of online learning are mixed, with a slight majority suggesting that online lectures are less intense than traditional ones. While students believe

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

they perform individual tasks more easily in an online environment, they find online team-based tasks more challenging (ibid).

Some authors argue that students, representatives of risk groups and different types of minorities face serious challenges in adaptation toto online learning courses (Edmunds, Gicheva, Thrift, Hull, 2021). Hamdan et al. (2021) observe notable differences in student satisfaction based on factors such as education level, type of university, and marital status. According to them, key predictors of students' satisfaction with online education included self-regulated learning, internet self-efficacy, interactions between learners and content, interactions among learners, and the number of theoretical courses offered through e-learning. Tang et al. (2021) pay attention to the level of readiness of different types of students to the online learning process. They found out that postgraduate students demonstrate a significantly higher level of readiness across most dimensions compared to undergraduate and sub-degree students. The level of acceptance of online education is closely connected to the satisfaction of the quality of this education. In this regard, Sitar-Tăut, Mican and Moisescu (2024) claim that student satisfaction is positively affected by perceived usefulness, ease of use, health safety, and the alignment between tasks and technology, while it is negatively influenced by feelings of social and professional isolation.

In contrast, convenience, well-being challenges, technostress, and privacy-related risks do not significantly impact satisfaction with online education. Additionally, satisfaction, social disengagement, and social norms shape students' propensity for online learning and their intentions to withdraw from it (ibid). Tseng, Wu, Lian and Zhuang (2023) consider the importance of the platform type for the effective online process. Their findings suggest that instructional support, instructor enthusiasm, and preparedness are critical factors in shaping the perceived value of online learning platforms for acquiring internet entrepreneurship knowledge and skills. According to the scholars, this perceived value, in turn, has a positive effect on the intention to reuse such platforms. Additionally, they admit that the intention to reuse online platforms significantly enhances positive learner responses. The relationship between perceived value and reuse intention is stronger for free platforms compared to paid ones (ibid).

At the same time, Kim and Chung (2023) pay attention to one very critical point in e-learning – the effectiveness of safety education in the e-learning environment, which is a very serious matter, when we consider the strengths and weaknesses of the e-learning process.

Based on the progress of new technologies and the latest trends in education, Ryneveld (2023) proposes a special framework for fully online distance education. Sulistiyani, Meutia and Firmansyah (2024) define four major elements for adopting an effective online learning process: technology, adequate infrastructure, organization and human resources. Lou and Li (2024) developed a model that defines the online education student learning status based on the dual improved neural networks. Adib (2024) examines how experiential learning influences student attitudes toward sustainability. According to the scholar, integrating additional business simulations (based on the new technologies) into curricula is contingent upon students' willingness to engage with these experiential learning tools in the future, as well as the impact of positive word-of-mouth stemming from their experiences. However, Savolainen (2023) explains that staff's social skills significantly influence the safety of learning environments, the teaching tools and resources they utilize, the effectiveness of information flow, and their knowledge of safety and security protocols.

A lot of scientific interest is put into the blended learning process – a good combination and mix of online and traditional lessons in university. The so-called "blended" or hybrid education process is considered a useful tool for the modern educational system, including the tertiary education level. In this regard, Bruggeman et al. (2021) have defined several adaptive points important for the blended learning process, such as the education-oriented learning process, willingness to change, experiments and discussion, creative sustainable integration of new technologies in the education process, critical self-reflection, etc. Choi, Robb, Mifli and Zainuddin (2021) pinpoint the strengths of the blended education process. According to them and the conclusions of their research, the effective implementation of online learning requires the integration of blended education to enhance the learning experience. They also pay attention to the effective communication between lecturers and students, which is a critical factor for success, irrespective of the type of class involved. Minadzi and Segben-

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

ya (2024) prove the power of human resources in blended learning, and Li and Yoon (2024) provide specific knowledge on blended education in tertiary education. Interesting research on specifics of blended learning is developed by Graham and Halverson (2022), Stap et al. (2024), Hossain, Salam and Akhond (2024), McLean et al. (2019), Adarkwah and Huang (2023) etc.

Blended type of education is considered also applicable and adequate in very specific cases such as education and training in nuclear engineering for instance is (Frybortova et al.; 2024); medical education (Abuzaid; 2024); education in the field of security (Stoykov, 2024); engineering education (Dimcheva, Stoyanov, 2024). Some authors even go deeper and explore, for example, the benefits of online gamified education activities (Gao, 2025), the usage of virtual reality technology in sports education (Pan, 2024), and game-based education in finance (Cannistrà, 2024).

Hurajova, Kollarova and Huraj (2022) conclude that modern online technologies play a crucial role in maintaining the adaptability of the educational process during emergencies. At this line, authors are expected to remain an essential component of university education, securing the sustainability of tertiary education in the near future.

3. Method

The aim of the current study is to understand the opinions and attitudes of students and university professors about the quality of the learning process of these three forms of education – traditional, online and blended/ hybrid and, in general, their attitude toward using new technologies in the learning process of the universities. Based on the analysis of the collected responses, we could understand their preferences, and with this information, we could propose some ideas and recommendations for improving the quality of the educational process in universities, considering the opinions of the main stakeholders.

In order to achieve this major goal, we went through several key tasks as follows:
- to explore the existing scientific literature on the different forms of education (online, hybrid and traditional) with special attention to blended research;
- to develop special questionnaire designed for the needs of the current study, covering all aspects of the formulated hypotheses;
- to spread as much as possible the questionnaire among our main target group – namely students in full-time programmes (Bachelor, Master and Doctorial) and university professors having classes in these programmes.
- to define sufficient period for the target group to fulfil the questionnaire
- to develop a comprehensive analysis and conclusion based on this analysis
- to propose workable solutions for blended learning.

We started by defining of two hypotheses which we intend to explore comprehensively through our empirical research:

The first hypothesis: Students are willing to explore different learning tools and methods based on new technologies (such as virtual reality, gamification, etc.) during their university classes.

The second hypothesis: Full-time students prefer blended/ hybrid learning processes to only traditional face-to-face classes or fully online learning.

Therefore, our major target group consists predominately of students in full-time programmes and their lecturers. The questionnaire contains 20 closed questions in total, 3 of which are devoted to the demographic characteristics of responders. The research is based on the results of the empirical study, released among university students (500) and university professors (50), using online form. The questionnaire was distributed among university students and university professors within the University of National and World Economy as one of the biggest business universities in Southeast Europe. At the same time, this current empirical research is a part of overall study, entitled Digitalisation of the learning process in Higher Education - Identification and Management Model, funded by the Bulgarian National Science Fund. As a result, we have received answers

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

from 396 students and 31 university professors – or 427 responses in total. The demographic profile of responders is presented in Table 1.

As can be seen from the table below, predominately in the students group, we have female responders 59% (versus 41% male responders). In terms of the programme, the major group of responses comes from students in a Bachelor full-time programme (88%), followed by students in a Master's degree programme (7%) and a Doctoral programme (5%). This structure of responses shows the active and engaged part of students from one side (traditionally, students in the first two years of education in bachelor programmes are more active and show more engagement with university life). On the other hand, the low share of Master students is explicable with the proportion in reality, but also with a traditionally weaker commitment of these students to university activities other than their focused curricular assignments. Impressive group of responded students are between 18-23 years old (92%), followed by those aged 24-29 years (5%) and logically, the smallest group is formed by students over 30 years old (3%). This proportion could be considered once again as evidence that the more active group of youth in terms of social media, internet, etc., with the desire to express their opinion about new technologies and trends is the group between 18-23 years old university students.

Table 1. Demographic profile of the respondents

University students (396 responses)						
Gender	Male	41	Female	59	Other	0
Programme	Bachelor	88	Master	7	PhD	5
Age	18-23 years old	92	24-29 years old	5	30+ years old	3
University professors (31 responses)						
Gender	Male	47	Female	53	Other	0
Age	Up to 35 years old	26	36-45 years old	39	46+ years old	45
Position	Professors	39	Associate professors	23	Assistant professors	40

Source: Own research

As far as the profile of university students is concerned, we have again a slight predominance of female responders (53% over 47% male). In terms of age, the major representative group here is formed by people over 46 years old (45%), followed by the group of 36-45 years old (39%), and the smallest group is university lecturers up to 35 years old (26%). The university academic position is another aspect we explore within the demographic profile of responders. Here, we have an almost equal proportion of university professors (39%) and assistant professors (40%). The associate professors comprise the smallest respondent group (only 23%).

4. Results and Discussion

The questionnaire contains 17 closed questions, exploring the attitude of students and their lecturer in the different aspects of blended/ hybrid learning process. We start with the direct question: Which type of education do you prefer with three possible options of answers: hybrid learning; traditional face-to-face learning or online learning. We purposely chose to start our survey with this particular question for two main reasons: first, it's a straightforward question that we ask for respondents' first-hand opinions without too much thought. Here, we aim to understand their initial attitude, referring to the experience of the previous years during the Covid-19 pandemic and the post-pandemic years, within which new trends in the educational process at different levels of education were imposed. Results are presented in Fig. 1.

The results of the question are definitive on only one line - and this is the attitude that respondents demonstrate towards online education - only 12% of respondents claim that they prefer a fully online learning process. The rest of the responders are spread into two almost equal groups, with a small predominance of the group choosing blended/ hybrid education (47%), followed by the "conservative" group, which prefers only the traditional face-to-face education process. This relatively small distance between these two groups could be considered a result of the type of educational programme our respondents used. The main focus of full-time students should be learning; therefore, their efforts must focus on achieving as much high quality of the educational process as possible. Here comes the logic of preference between these two major groups. Here, we also

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

have to consider that this question is too general (as a first question), and the analysis of the results of the following questions will give the desired nuance of acceptance and preferences of university students in different types of education forms.

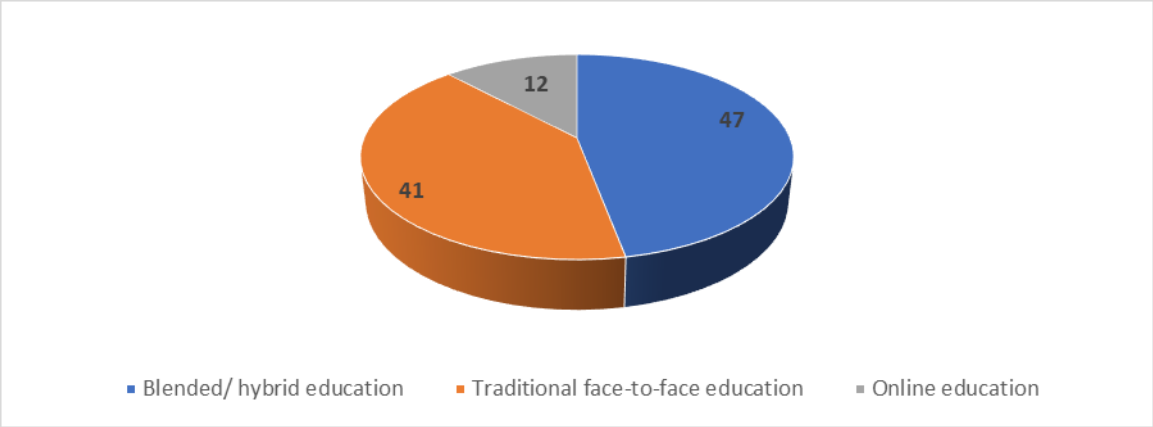


Fig. 1. Preferences about the type of education process (in %)
Source: Own research

The second question is, "How do you rate the efficiency of the hybrid learning process compared to the face-to-face learning process?" (Fig. 2).

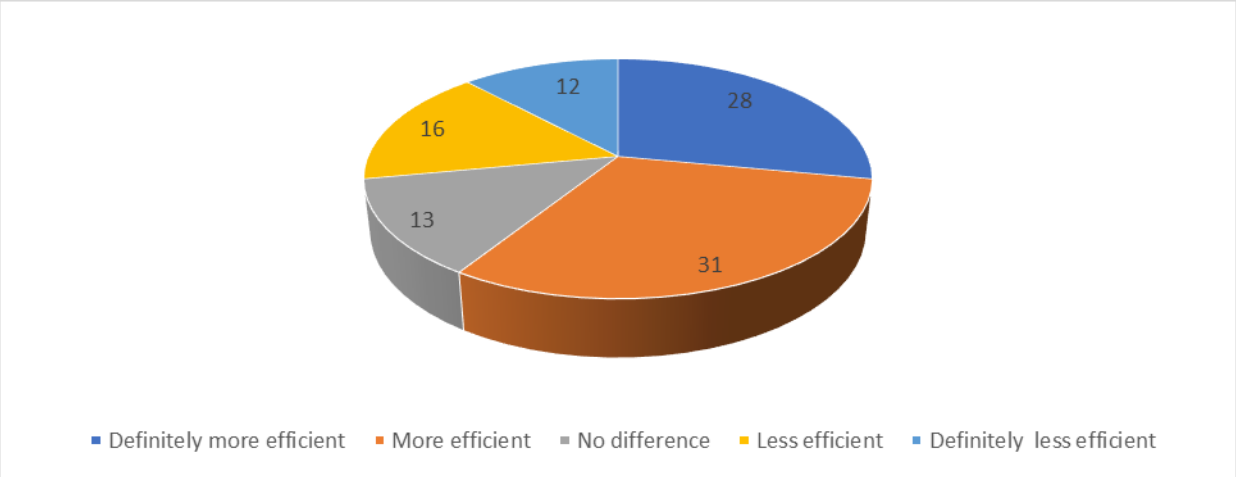


Fig. 2. Assessment of the efficiency of the hybrid learning process compared to the face-to-face learning process (in %)
Source: Own research

The results of this question are categorical: 59% in total of our respondents are positive that the blended learning process is more efficient than the traditional one (31% found that it is more efficient, and another 28% claim that it is definitely more efficient). At the same time negative responses form 28% in total (12% definitely less efficient and 16% - less efficient), while 13% report that there is no difference in efficiency in these two types of education. This result confirms the initial tendency to accept the blended learning process over the traditional one.

The next question is similar to the previous one, but this time, respondents are asked to assess the efficiency of online education compared to the traditional ("How do you rate the efficiency of online learning compared to face-to-face?"). Results draw an interesting picture (Fig. 3).

34% in total (16% definitely efficient and another 18% - efficient) find that the online learning process is more efficient than the traditional face-to-face learning process. The majority of the respondents – 51% in total have the opposite opinion – the online learning process is less efficient than traditional (31% - less efficient and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

another 20 – definitely less efficient). Here, the percentage of people who do not find a difference between the two types of educational process remains relatively high – 15%.

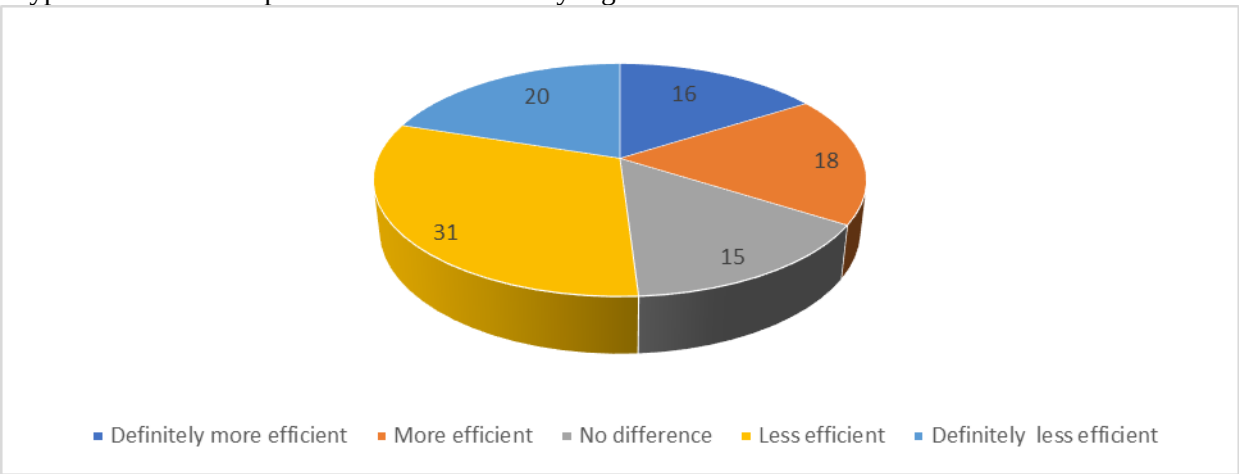


Fig. 3. Assessment of the efficiency of the online learning process compared to the face-to-face learning process (in %)
Source: Own research

The next question reveals the level of satisfaction with the communication process between students and their lecturer and is the following: "What is your satisfaction with the communication with the teachers in the different types of education?" (Fig.4).

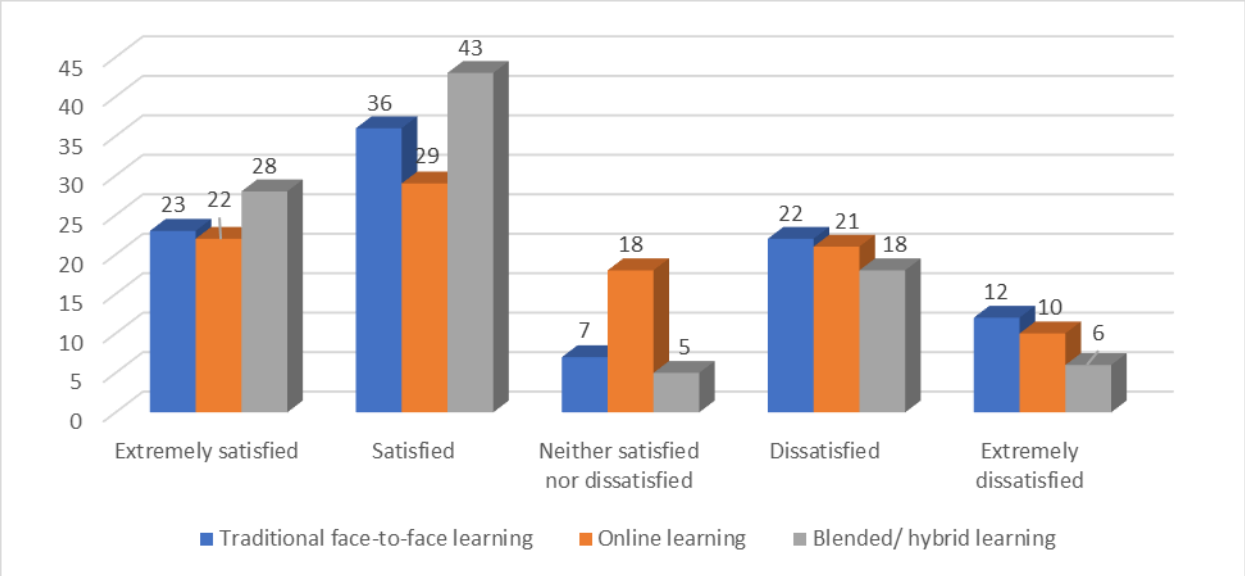


Fig. 4. Share of satisfaction of the communication process between students and their lecturers (in %)
Source: Own research

As can be seen from the figure above, in all three types of education, students and professors demonstrate a relatively good level of satisfaction in communication with each other. The highest share of extreme satisfaction was received through communication in the blended/ hybrid learning process (28%), followed by traditional learning (23%), and with a small difference in third position comes online learning. This result is reasonable, considering two important facts: students are representative of the generation which has grown up with new technologies and is used to communicating primarily through digital applications and secondly, blended learning deals with major weaknesses of online learning, including lack of sufficient direct communication between students and professors. The level of satisfaction (second category), in fact, deepens the observation in the first one – the highest level of satisfaction goes to the hybrid/ blended learning process (43%), followed by face-to-face education (36%), and the last position is for online education (29%). At the same time, the share of people who are not sure if they are satisfied with the communication in different types of

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

education marks its highest score, namely in online education (18%). This finding could be explained again in the dichotomous germ of the type of communication most respondents are used to.

On the one hand, they use digital communication literally every minute, mostly in their private life. Therefore, maybe one part of the respondents could not find satisfaction in the mix between different types of communication – private and university/ academic life. At the same time, it is possible that some respondents do not take communication as seriously in an online environment, perhaps due to the greater possibility of distraction. It should also be noted here that the traditional form of education has the highest levels of dissatisfaction, albeit by a small margin from the other two.

"What is your satisfaction with communication with other students in different types of education?" is the next question from the survey (Fig.5). Obviously, communication in the traditional face-to-face learning process is preferred as this is the type, where both university students and professors claim that it is extremely satisfied. 87% of our respondents found communication between university students in traditional educational environments satisfactory (45% - extremely satisfied and 42% - satisfied), and only 12% of respondents found this type of communication unsatisfactory. At the same time, the total share of satisfaction from communication between students in hybrid/ blended learning process is 65%, while the total share of dissatisfaction is 31%.

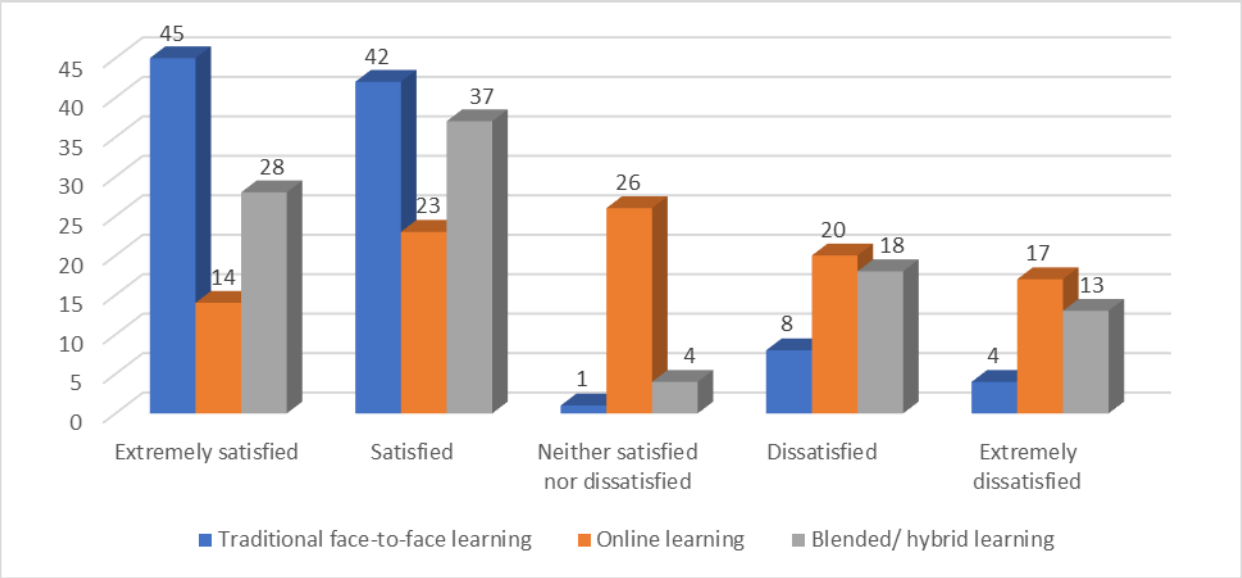


Fig. 5. Share of satisfaction of communication process between students (in %)
Source: Own research

At the same time, the online learning process marks the lowest level of satisfaction in communication between students – only 37% of them in total (14% extremely satisfied and 23% satisfied) claim that the communication is satisfactory. Here the level of lack of satisfaction is highest – 37% in total, while another 26% claim that communication is neither satisfied nor dissatisfied. Here, one of the advantages of the traditional educational process, which is obviously recognized and accepted by both sides, manifests itself the most - direct communication. Although the students themselves are used to new technologies and digital communication in a personal capacity, when it comes to communication related to the learning process and work tasks, they prefer direct communication.

The next question is, "How convenient is the access to the learning materials in different types of education?" (Fig. 6). The results unequivocally show here one of the biggest advantages of digitization in terms of education, namely the easy access to various educational materials. As can be seen from the figure, traditional forms, in this sense, are significantly behind the possibilities that new technologies provide. In this regard, it is very easy to explain the advantages of online learning and hybrid learning, which have relatively similar results. However, the total share of people feeling comfortable and very comfortable in access to educational materials in blended learning is 72%. In comparison, this share in online learning is 71%, which is not signifi-

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

cant. At the same time, a traditional form of education face-to-face marks only 27% in total, which could be explained again by the customs and habits of today's university students. They are used to reading and studying from digital materials (including easy orientation in the digital environment and the easiest way for them when they have to search and explore concrete subjects) rather than in traditional hard-copy books, manuals and other educational materials.

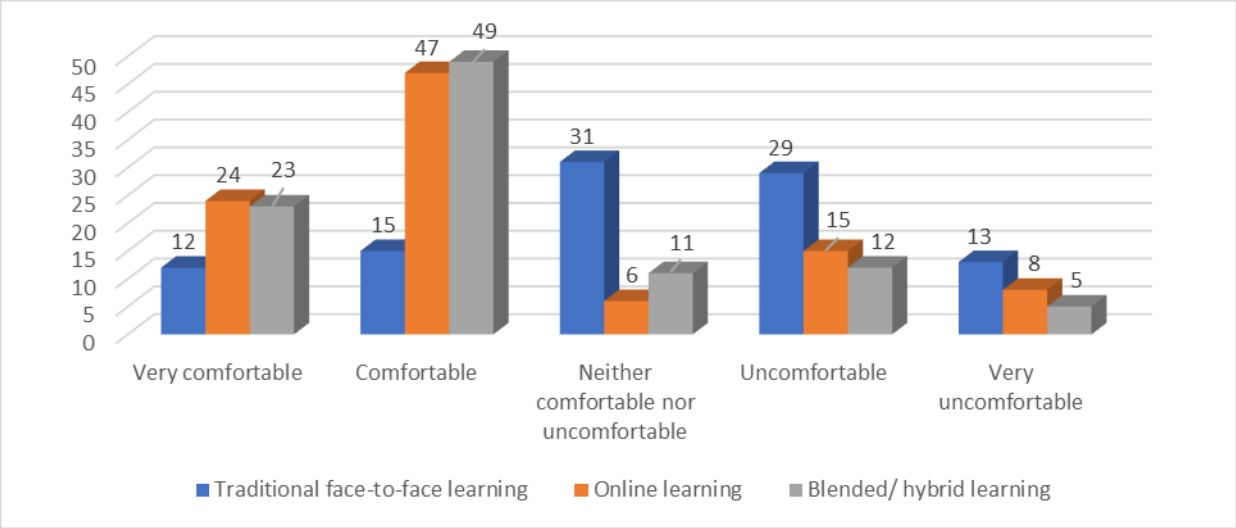


Fig. 6. Comfortability of access to learning materials in different forms of education (in %)
Source: Own research

The next question is, "How do you rate the flexibility of the learning process in different forms of education?". Results are presented in Fig. 7.

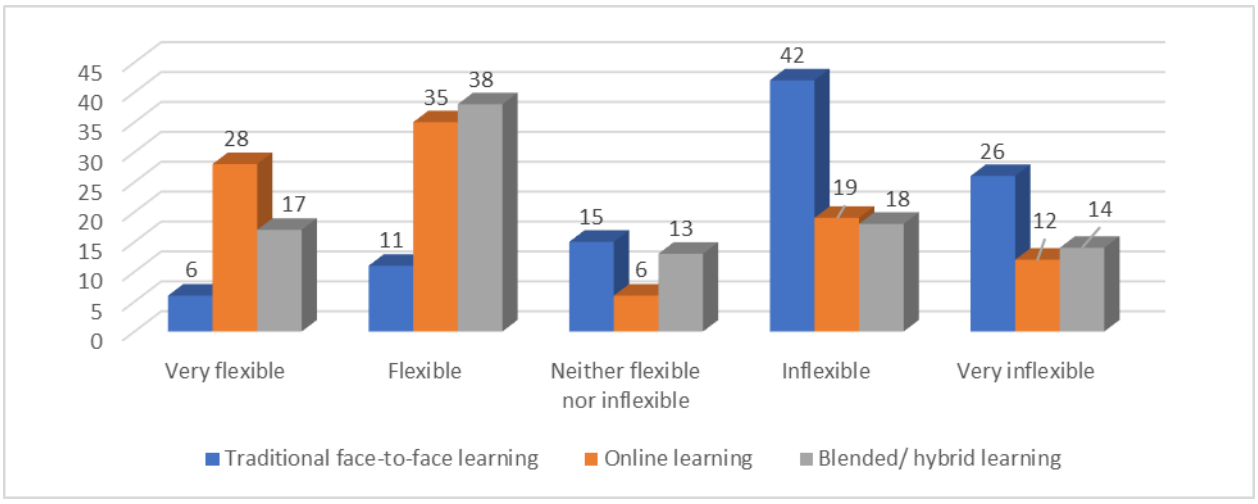


Fig. 7. Flexibility of the learning process in different forms of education (in %)
Source: Own research

Again, the results are clear and present evidence of the advantage of digitalization in education – more flexibility for all stakeholders, especially students. The online learning process gives more flexibility (63% of responses in both levels), while on the opposite opinion, 31% of our respondents. The flexibility of online education collected the biggest share of responses in the assessment "very flexible" – 28%, which is a significant score, especially compared to the result here of blended learning - only 17% of respondents claim that blended mobility is very flexible. This result is logical, including the positioning of the flexibility of the blended learning process – namely between traditional and online learning. At the same time, 68% of respondents admit that traditional learning is not flexible, while for the blended learning process, this share is almost half – 32%. This means that blended or hybrid learning processes can overcome the weaknesses of traditional and online

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

learning, offering a good environment and combining traditional forms of education and opportunities for new technologies.

The next question is "Do you encounter technical problems with different forms of education?". It aims to understand how respondents are technically prepared for the different types of learning processes (Fig. 8).

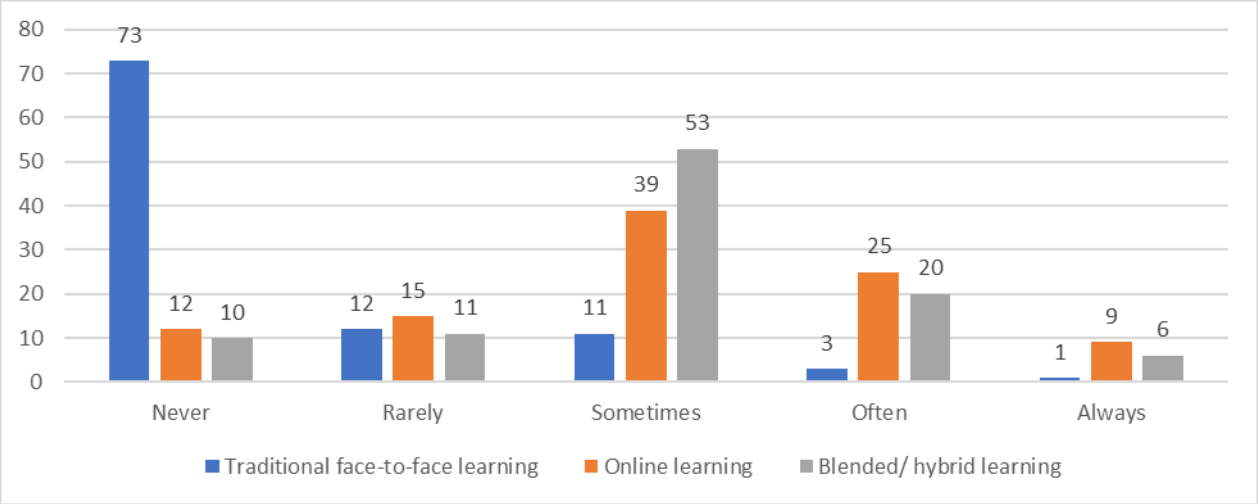


Fig. 8. Frequency of technical problems in different forms of education (in %)
Source: Own research

Based on the results, we could consider that, in general, for all types of educational processes, no serious technical difficulty is foreseen, both in terms of students and in terms of their teachers. This speaks of a rather high technical culture both students and lecturers possess. On the other hand, it should be noted that, logically, with the traditional form of training, the least difficulties of a technical nature are noticed (as many as 73% states that they never had technical problems with this form of training). This categoricalness is normal, bearing in mind the relatively limited technical resources that are used in the traditional educational process, especially compared to the online education process. The majority of respondents here choose "sometimes" when it comes to online (39%) and blended learning (53%). At the same time, 25% of respondents admit they often encounter technical difficulties in online learning, and 20% in blended/ hybrid learning. Here, we do not go into any deep research regarding the type of technical problems - they can be both from the lack of Internet due to unexpected power outages and the lack of a good technical means with which the educational process can be carried out online without any problems in a digital environment.

The next question is "What do you think are the main advantages of different forms of education?" and the respondents have the opportunity to choose here more than one answer (Fig. 9). The results are apparent and highlight the benefit of the mixed educational process - out of all 5 positions of the question, it receives the largest share of three: personal attention from the professors; improved communication and flexibility and convenience. Flexibility and convenience represent a complex indicator, and its complexity gives the leading place to the blended/ hybrid learning process. On the other hand, personal attention from the professors was recognized as an advantage of the blended educational process by 43% of respondents. In comparison, the traditional form of education here collects 36%, and online learning - only 28%. The key to these results may again lie in the way of communication that today's students are used to. A personal e-mail or chat between a professor and a student may be perceived by the student as a much more individual communication than the direct form of communication in a traditional auditorium when the student is in the company of other colleagues. The same comment could be relevant for the criterium "improved communication", which again leads to the first-place blended learning process.

At the same time, the traditional education process is a leader in one position – more social interactions with a share of 43%, compared to blended learning with 34% and the online education process with 12%. Here, the specifics and benefits of direct presence and communication between colleagues in an academic environment

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

have their best projections. For its part, the online education process is leading in terms of improved access to learning materials.

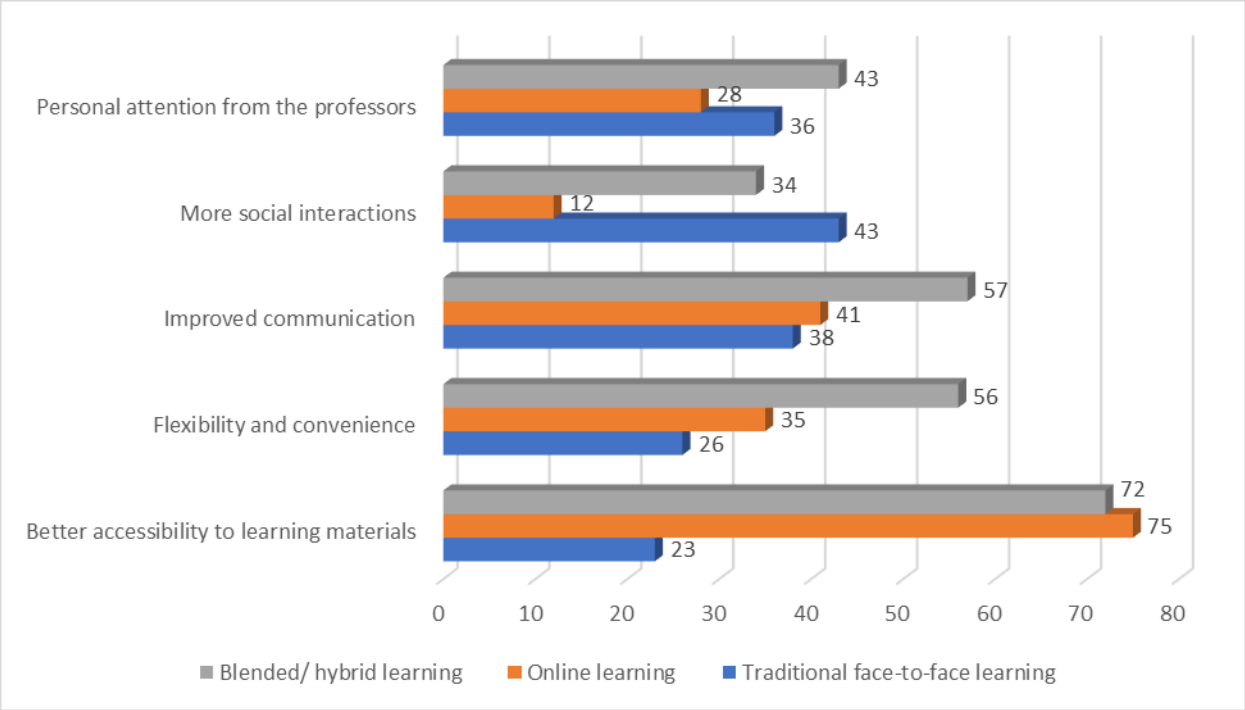


Fig. 9. Advantages of different forms of education (in %)
Source: Own research

"Which of the following technologies have you used in the training process?" is the next question, and again, the respondents have the opportunity to select more than one answer. Results reveal that Artificial Intelligence (AI) is the most familiar and the most used tool within the educational process and the implementation of various educational tasks. 61% of respondents claim that they used AI in their training process. Another 56% admit that gamification and Virtual reality (VR) are in the last position, with a share of 32%. Here, it is important to notice that 33% of respondents claim that they have never used such technologies in the educational process or in the performance of assigned tasks (Fig. 10). This percentage may be too high, especially considering AI's great progress in the last few years. Perhaps behind these data lies, to some extent, the uncertainty of using, for example, AI in the performance of a personal academic task. Considering the lively and still open discussion about the role of authorship and the role of artificial intelligence in such situations, it is quite possible that some of our respondents did withhold part of the truth, even though the survey was anonymous and voluntary.

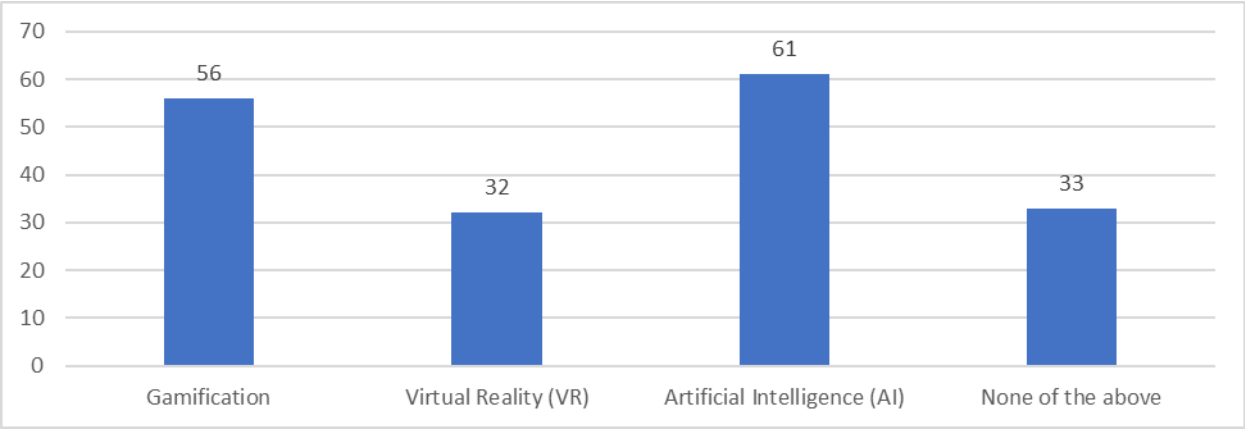


Fig. 10. Level of usage of new technologies in the learning process (in %)
Source: Own research

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

The next question is "How effective do you find gamification in improving the learning process?" (Fig. 11). The majority of responders (42%) find gamification a useful tool in the learning process as well and another 27% are even more convinced of its effectiveness. 14% could not give any suggestions, and 17% did not find any effectiveness that gamification could bring to the learning process.

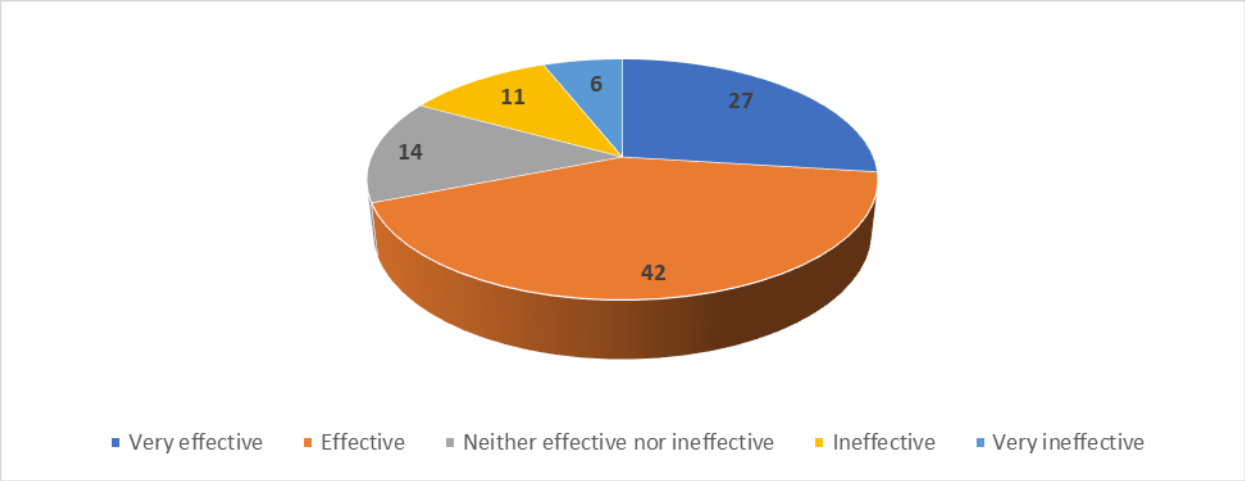


Fig. 11. Effectiveness of gamification in the learning process (in %)
Source: Own research

The next question is similar to the previous one, but this time Virtual reality (VR) is in focus: "How do you assess the possibility of using virtual reality in the learning process?" (Fig. 12). Here, the respondents are more convinced, and the VR meets a greater level of approval than gamification. 52% of respondents find VR useful in the learning process, with another 30% even more extreme in their positive opinion. This makes 82% of the respondents ultimately believe that VR can be a very useful tool through which other levels of knowledge of the studied subjects can be reached. Only 7% have a negative opinion on the usefulness of VR in the education process – the majority do believe in the benefits and advantages that VR can contribute to improving the quality of the academic process.

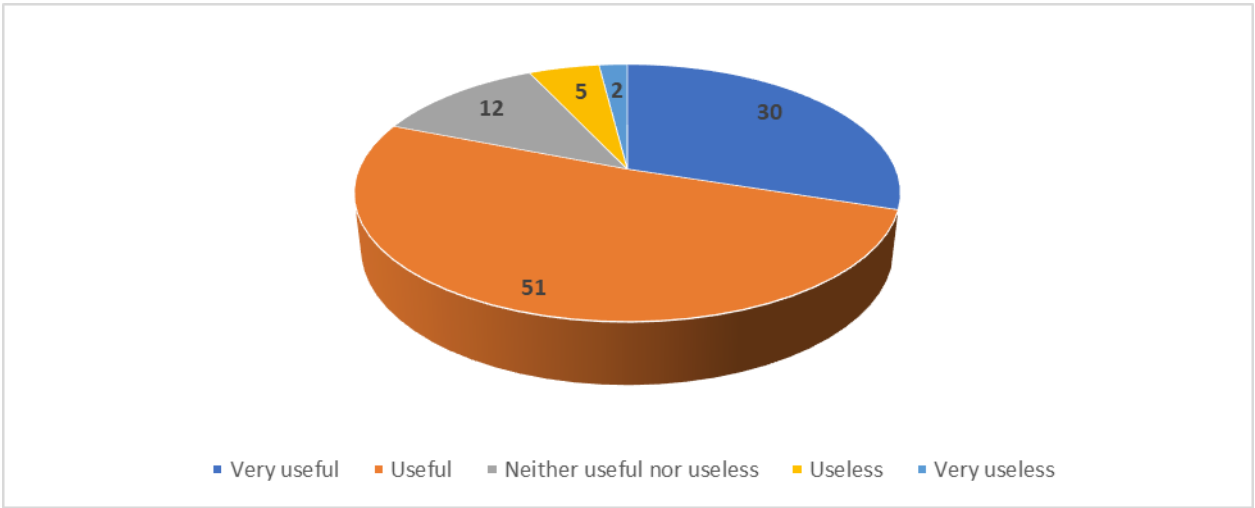


Fig. 12. Usefulness of Virtual reality in the learning process (in %)
Source: Own research

The next question logically is related to the AI in university learning process and reads as follows: "How do you rate the use of artificial intelligence to personalize the learning process?" (Fig. 13). Here again, we have a major share in positive spectrum – 55% in total of our responders find that AI is very useful (13%) as well as useful (42%). Unlike the previous two questions, however, here the share of people who chose the answer "neither useful nor useless" is significantly higher – 21% (in comparison - the share of those who answered in

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

this way regarding gamification is 14%, and that for virtual reality - 12%). This relatively large uncertainty in the respondents' answers can be attributed to the second part of the question, which specifies the usability of AI in terms of personalization of the learning process. Perhaps the respondents themselves currently do not have enough personal experience to judge whether AI would support the personalization of the learning process or not. In this sense, the next academic years will be indicative in this regard.

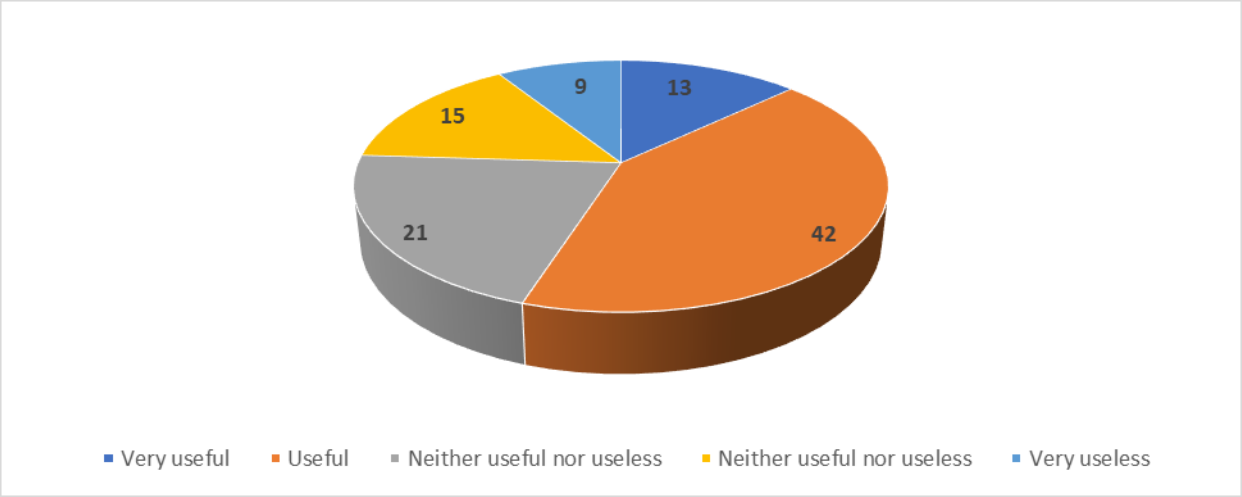


Fig. 13. Usefulness of AI for personalizing the learning process (in %)
Source: Own research

We try through the following questions to understand the perceptions of students and professors regarding the benefits and advantages that VR could bring to the learning process. The question is: "What do you think are the main advantages of using virtual reality in education? The respondents had the opportunity to choose multiple answers (Fig. 14).

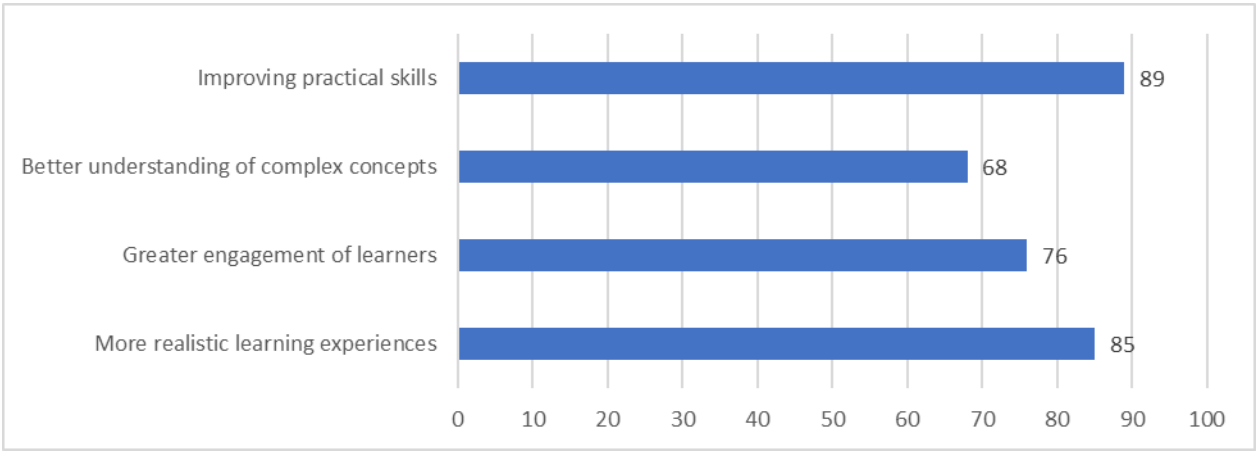


Fig. 14. Main advantages of VR in the learning process (in %)
Source: Own research

As can be seen from the figure above, all presented advantages are recognized and very well received by respondents, as they all scored over 65% approval. The opportunity to improve practical skills through VR was rated the highest, receiving 89% of respondents' votes. The next very strong benefit of using VR in the learning process, recognized by our respondents, is related to the possibility for students to receive more realistic learning experiences (85%). Next comes greater learner engagement, which can be obtained through VR, and with the lowest score (but still accepted by a large proportion of survey respondents) is the possibility of a better understanding of complex concepts with the use of VR (68%). In addition, the respondents also highlight the advantages of the usage of VR in the education process in the following directions: achieving experi-

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

ential learning, Low level of distraction, equal access to all (including for students with disability), possibility of instant assessment and real-time reaction and feedback, etc.

The next question is devoted to AI but is focused on its disadvantages: What do you think are the main disadvantages of using artificial intelligence in education? (Fig. 15).

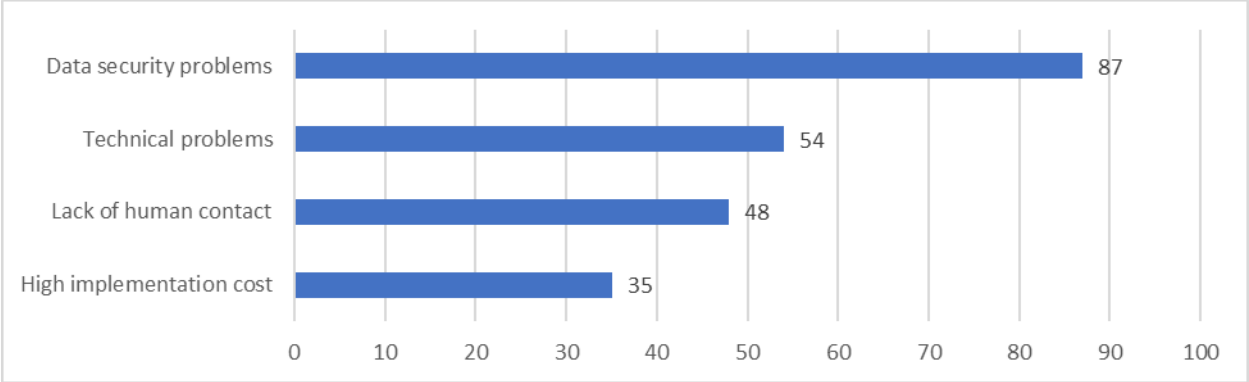


Fig. 15. Main disadvantages of using AI in the learning process (in %)
Source: Own research

As can be seen from the figure, the definitely high costs associated with the implementation of AI in the educational process is not recognized by a sufficiently large number of respondents as a serious drawback. Only 35% of respondents consider this to be a disadvantage. This result perhaps indirectly shows the desire and positive attitude of a large part of university students towards the possibility of using AI in the learning process. In this sense, for them, the value of the investment, no matter how large and significant it is, is justified from the point of view of effect and improvement of the quality of the educational process. The main drawback of implementing AI in the learning process is related to data security. 87% of respondents point to it and say it is the biggest challenge for AI-related learning objectives in university education courses. This problem and the trust of all must be solved before moving towards a stronger advocacy of AI in universities. According to our respondents, technical issues are the second most important drawback to AI in the learning process. Here their concerns, as with the previously commented shortcoming, are justified, and the educational institution itself should very carefully evaluate its available educational infrastructure, adapt it and only then implement AI to avoid such technical problems as much as possible. Almost half of respondents believe that the lack of human contact in AI is a problem, which is also the drawback rated with the fewest votes (48%). Considering that our main target group and respondents are representatives of a generation that grew up in the digital world, this one is not much on the agenda, especially compared to the other disadvantages mentioned.

“How easy is it for you to use technologies such as virtual reality and artificial intelligence in the learning process?" is the following question (Fig. 16). For the majority (51% in total), the usage of VR and AI in learning process is easy (33%) or very easy (18%), which once again provides further evidence that students expect new technologies to increasingly permeate their university studies. A total of 23% hold the opposite opinion, and another 26% believe that it is neither easy nor difficult to use new technologies such as AI and VR in the educational process at universities.

The last question aims to collect information about the general perception in evaluation that new technologies have on the motivation for learning. The question is, "How do you rate the overall impact of gamification, virtual reality and artificial intelligence on your motivation to learn?” (Fig. 17).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

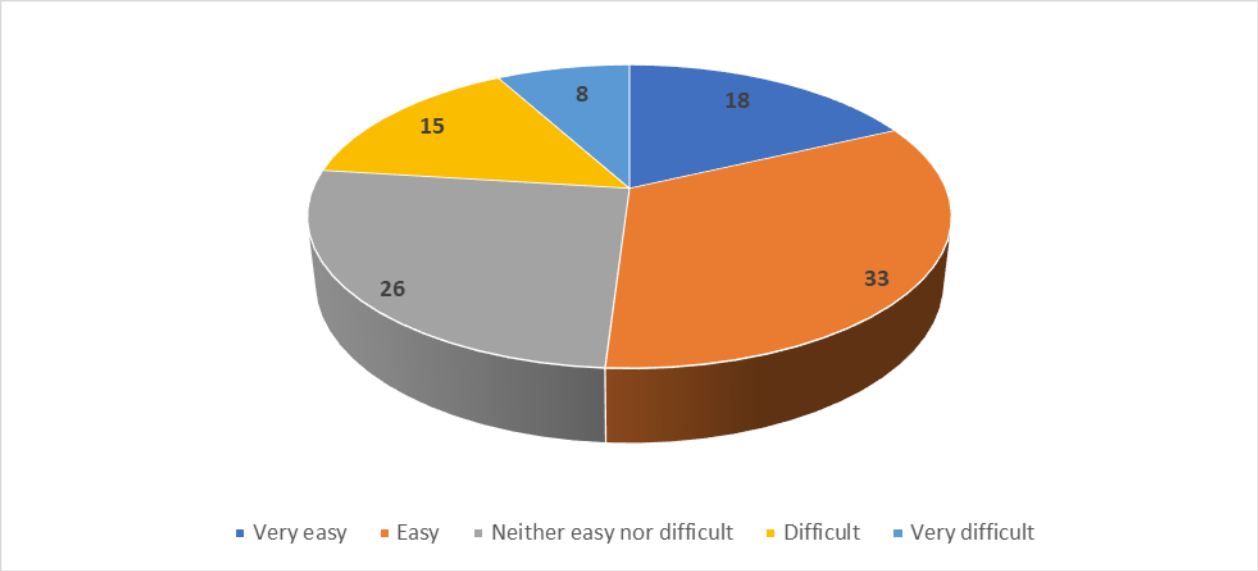


Fig. 16. Easiness in the usage of new technologies in the university learning process (in %)
Source: Own research

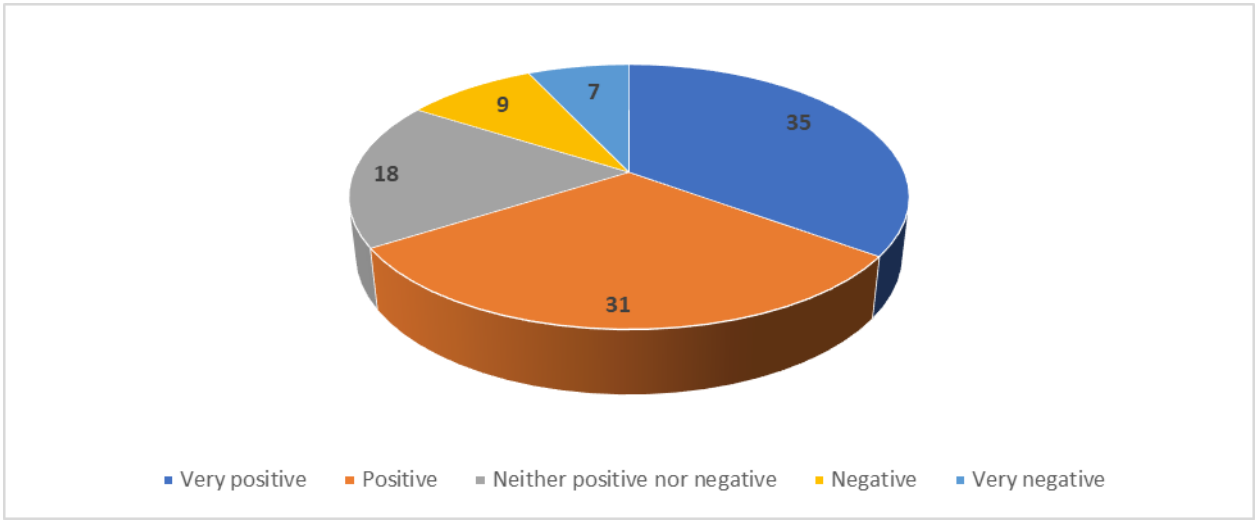


Fig. 17. Assessment of the relation between the usage of new technologies in university and learner motivation (in %)
Source: Own research

As seen in Figure 17, 66% of respondents are convinced that new technologies have a positive (31%) and even very positive (35%) impact on their motivation to learn. This result clearly proves the need for deeper integration of the new technologies in the educational process in universities. At the same time, only 16% of the total reported negative, and another 18% were not sure about the impact of new technologies on their motivation for learning.

5. Conclusion and recommendations

To meet the ever-increasing demands of students, universities are increasingly looking to the possibilities that new technologies provide. AI and VR are just some of the options that can be introduced into the university education process. Through the possibilities that new technologies can provide, some of the most serious challenges of the traditional learning process can be overcome - starting with improving the flexibility of the program and reaching an improved level of concentration, attention and motivation of students in class.

The results of this study strongly confirmed our initially defined hypotheses, namely that (first hypothesis) Students are willing to explore different learning tools and methods based on new technologies (such as virtu-

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/w4662779545

al reality, gamification, etc.) during their university classes and Second Hypothesis: Full-time students prefer blended/ hybrid learning process than only traditional face-to-face classes or fully online learning.

As evidence for the first hypothesis, 66% of respondents are convinced that new technologies have a positive (31%) and even very positive (35%) impact on their motivation to learn. This result clearly proves the need for deeper integration of the new technologies in the educational process in universities. In terms of concrete technologies, 69% in total (42% useful, 27% - very useful) find gamification as a useful tool in the learning process within the universities; VR meets a greater level of approval than gamification – 82% in total (52% useful and 30% very useful); 55% in total of our responders find that AI is useful (42% - useful and 13% - very useful). For the majority (51% in total) of respondents, the usage of VR and AI in the learning process is easy (33%) or very easy (18%), which once again provides further evidence that students expect new technologies to increasingly permeate their university studies.

As evidence for the second hypothesis, 47% of respondents prefer blended/ hybrid learning over traditional (41%) or online (12%). The blended/ hybrid learning process receives the most considerable acceptance for the following advantages: personal attention from the professors, improved communication, flexibility and convenience. Personal attention from the professors was recognized as an advantage of the blended educational process by 43% of respondents. In comparison, the traditional form of education here collects 36%, and online learning - only 28%.

The results of the present study unequivocally show the trends in the future development of universities and the possibilities for the integration of new technologies according to the expectations of today's students.

References

Abuzaid, M.M., Elshami, W., Hamd, Z.Y., Almohammed, H., Alorainy, A. (2024). Evolving radiology continuing medical education: Tapping into the power of online learning, *Radiography*, 30(5), 1434-1441. https://doi.org/10.1016/j.radi.2024.07.023

Adarkwah, M. A., Huang, R. (2023). Blended learning for the "multi-track" undergraduate students in Ghana in an adverse era, *Scientific African*, 21, e01772. https://doi.org/10.1016/j.sciaf.2023.e01772

Adib, H. (2024). Experiential learning in higher education: Assessing the role of business simulations in shaping student attitudes towards sustainability, *The International Journal of Management Education*, 22(2), 100968. https://doi.org/10.1016/j.ijme.2024.100968.

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19, *International Journal of Educational Research Open*, 1, 100011. https://doi.org/10.1016/j.ijedro.2020.100011

Alania-Contreras, R. D., Ruiz-Aquino, M., Alvarez-Risco, A., Condori-Apaza, M., Chanca-Flores, A., Fabián-Arias, E., Rafaele-de-la-Cruz, M., Del-Aguila-Arcentales, S., Davies, N.M., de Agui, M. L. O., Yáñez, J. A. (2024). Evolving attitudes toward online education in Peruvian university students: A quantitative approach, *Heliyon*, 10(9), e30566. https://doi.org/10.1016/j.heliyon.2024.e30566

Angelova, M. (2020). Students' attitudes to the online university course of management in the context of COVID-19. *International Journal of Technology in Education and Science* (IJTES), 4(4), 283-292.

Bruggeman, B., Garone, A., Struyven, K., Pynoo, B., Tondeur, J. (2022). Exploring university teachers' online education during COVID-19: Tensions between enthusiasm and stress, *Computers and Education Open*, 3, 100095. https://doi.org/10.1016/j.caeo.2022.100095

Bruggeman, B., Tondeur, J., Struyven, K., Pynoo, B., Garone, A., Vanslambrouck, S. (2021). Experts speaking: Crucial teacher attributes for implementing blended learning in higher education, *The Internet and Higher Education*, 48, 100772. https://doi.org/10.1016/j.iheduc.2020.100772

Cannistrà, M., Beckker, K. D., Agasisti, T., Amagir, A., Põder, K., Vartiak, L., Witte, K. D. (2024). The impact of an online game-based financial education course: Multi-country experimental evidence, *Journal of Comparative Economics*, https://doi.org/10.1016/j.jce.2024.08.001

Choi, J.-J., Robb, C. A., Mifli, M., Zainuddin, Z. (2021). University students' perception to online class delivery methods during the COVID-19 pandemic: A focus on hospitality education in Korea and Malaysia, *Journal of Hospitality, Leisure, Sport & Tourism Education*, 29, 100336. https://doi.org/10.1016/j.jhlste.2021.100336

Dimcheva, G., Stoyahov, I. (2024). Modern Perspectives in Bulgarian Engineering Education Through the Prism of Experts From the IT sector (Empirical study), Environment. Technology. Resources. Rezekne, Latvia, *Proceedings of the 15 th International Scientific and Practical Conference*, II, 345-351.

Edmunds, J. A., Gicheva, D., Thrift, B., Hull, M. (2021). High tech, high touch: The impact of an online course intervention on academic performance and persistence in higher education, *The Internet and Higher Education*, 49, 100790. https://doi.org/10.1016/j.iheduc.2020.100790

Frybortova, L., Sklenka, L., Novak, O., Vrban, B., Luley, J., Cerba, S., Korgul, A., Fijalkowska, A., Salvini, A., Alloni, D., Gandini, A. (2024). Online practical education and training in nuclear engineering: A methodological framework, *Nuclear Engineering and Design*, 423, 113146. https://doi.org/10.1016/j.nucengdes.2024.113146

Gao, T. (2025). Research on the design of online gamified tourism education activities based on Moodle platform, *Entertainment Computing*, 52, 100823. https://doi.org/10.1016/j.entcom.2024.100823

Graham, C.R., Halverson, L.R. (2022). Blended Learning Research and Practice. In: Handbook of Open, Distance and Digital Education. Springer, Singapore. https://doi.org/10.1007/978-981-19-0351-9_68-1

Hamdan, K. M., Al-Bashaireh, A. M., Zahran, Z., Al-Daghestani, A., Al-Habashneh, S., Shaheen, A. M. (2021). University students' interaction, Internet self-efficacy, self-regulation and satisfaction with online education during pandemic crises of COVID-19 (SARS-CoV-2), *International Journal of Educational Management*, 35(3), 713-725. https://doi.org/10.1108/IJEM-11-2020-0513

Hossain, M. K., Salam, Md A., Akhond, M. R. (2024). Behavioral intentions of university teachers and students toward the adoption of the hyb-blended learning method: Evidence from Bangladesh, *Heliyon*, 10(14), e34520. https://doi.org/10.1016/j.heliyon.2024.e34520

Hossain, Md. J., Ahmmed, F., Rahman, S. M. A., Sanam, S., Emran, T. B., Mitra, S. (2021). Impact of online education on fear of academic delay and psychological distress among university students following one year of COVID-19 outbreak in Bangladesh, *Heliyon*, 7(6), e07388. https://doi.org/10.1016/j.heliyon.2021.e07388

Hurajova, A., Kollarova, D., Huraj, L. (2022). Trends in education during the pandemic: modern online technologies as a tool for the sustainability of university education in the field of media and communication studies, *Heliyon*, 8(5), e09367. https://doi.org/10.1016/j.heliyon.2022.e09367

Kim, B.-J., Chung, J.-B. (2023). Is safety education in the E-learning environment effective? Factors affecting the learning outcomes of online laboratory safety education, *Safety Science*, 168, 106306. https://doi.org/10.1016/j.ssci.2023.106306

Li, H., Yoon, S. J. (2021). Anchoring in the meso-level: Departmental preparation for the adoption of blended learning in tertiary education, *System*, 121, 103239. https://doi.org/10.1016/j.system.2024.103239

Lou, Y., Li, F. (2024). Design of an online education student learning status evaluation model based on dual-improved neural networks, *Intelligent Systems with Applications*, 22, 200370. https://doi.org/10.1016/j.iswa.2024.200370

Madani, H., Adhikari, A., Hodgdon, C. (2024). Lessons from business education's online transition: A Saudi Arabian case study, *The International Journal of Management Education*, 22(3), 101026. https://doi.org/10.1016/j.ijme.2024.101026

McLean, J., Graham, M., Suchet-Pearson, S., Simon, H., Salt, J., Parashar, A. (2019). Decolonising strategies and neoliberal dilemmas in a tertiary institution: Nurturing care-full approaches in a blended learning environment, *Geoforum*, 101, 122-131. https://doi.org/10.1016/j.geoforum.2019.02.025

Minadzi, V. M., Segbenya, M. (2024). Usefulness and challenges with blended learning during the COVID-19 pandemic in Ghana: The mediating role of human resource factors, *Computers in Human Behavior Reports*, 16, 100468, https://doi.org/10.1016/j.chbr.2024.100468

Muthuprasad, T., Aiswarya, S., Aditya, K.S., Jha, G. K. (2021). Students' perception and preference for online education in India during COVID -19 pandemic, *Social Sciences & Humanities Open*, 3(1), 100101. https://doi.org/10.1016/j.ssaho.2020.100101

Pan, Y. (2024). Sports game teaching and high precision sports training system based on virtual reality technology, *Entertainment Computing*, 50, 100662. https://doi.org/10.1016/j.entcom.2024.100662

Ryneveld, L. van (2023). Toward a framework for the implementation of fully online distance education at a residential higher education institution, Editor(s): Robert J Tierney, Fazal Rizvi, Kadriye Ercikan, *International Encyclopedia of Education* (Fourth Edition), Elsevier, 287-295. https://doi.org/10.1016/B978-0-12-818630-5.02144-8

Savolainen, T. (2023). A safe learning environment from the perspective of Laurea University of applied sciences safety, security and risk management students and staff, *Heliyon*, 9(3), e12836. https://doi.org/10.1016/j.heliyon.2023.e12836.

Sitar-Tăut, D.-A., Mican, D., Moisescu, O.-I. (2024). To be (online) or not to be? The antecedents of online study propensity and e-learning-dependent dropout intention in higher education, *Technological Forecasting and Social Change*, 207, 123566. https://doi.org/10.1016/j.techfore.2024.123566

Stap, N., Bogaart, T., Ginkel, S., Rahimi, E., Versendaal, J. (2024). Towards teaching strategies addressing online learning in blended learning courses for adult-learners, *Computers & Education*, 219, 105103. https://doi.org/10.1016/j.compedu.2024.105103.

Stoykov, S. (2024). The system of education, training and research in the field of security - managing change through experience and knowledge, environment. Technology. Resources. Rezekne, Latvia, *Proceedings of the 15th International Scientific and Practical Conference*, IV, 269-274.

Tang, Y. M., Chen, P. C., Law, K. M.Y., Wu, C.H., Lau, Y.-y., Guan, J., He, D., Ho, G.T.S. (2021). Comparative analysis of student's live online learning readiness during the coronavirus (COVID-19) pandemic in the higher education sector, *Computers & Education*, 168, 104211. https://doi.org/10.1016/j.compedu.2021.104211.

Tseng, T.H., Wu, T.-Y., Lian, Y.-H., Zhuang, B.-K. (2023). Developing a value-based online learning model to predict learners' reactions to internet entrepreneurship education: The moderating role of platform type, *The International Journal of Management Education*, 21(3), 100867. https://doi.org/10.1016/j.ijme.2023.100867

Funding: This article is prepared and published with the financial support of the Bulgarian National Science Fund, under the project No. KP-06-H 45/7 entitled "Digitalisation of the Learning Process in Higher Education - Identification and Management Model"

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request.

Author Contributions: The authors contribute equally. All authors have read and agreed to the published version of the manuscript.

Tsvetana STOYANOVA is a Professor Ph.D. in the Department of Management, University of National and World Economy, Sofia, Bulgaria. Research interests: Strategic Management, HR Management, Leadership, Knowledge Management.
ORCID ID: https://orcid.org/0000-0003-3745-4551

Kiril ANGUELOV is a Professor Sc.Dr. in the Department of Management and Business Information Technologies, Technical university of Sofia, Bulgaria. Research interests: IT Management, Strategic Management, Digitalisation and reengineering of processes, and Supply Chain Management.
ORCID ID: https://orcid.org/0000-0001-7936-3290

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

Publisher
http://jssidoi.org/esc/home

INNOVATIVE MARKETING STRATEGIES IN ENTREPRENEURSHIP

Margarita Išoraitė

Vilniaus kolegija/Higher Education Institution, Saltoniškių Street 58, Vilnius, Lithuania

E-mail: m.isoraite@vvf.viko.lt

Received 11 July 2024; accepted 14 October 2024; published 30 December 2024

Abstract. The article analyses the innovative marketing strategies in entrepreneurship, focusing on guerrilla marketing and examining its tools and case studies. Guerrilla marketing is a strategy in which small businesses use creativity to compete with bigger companies. The main focus is on bold, modern ideas, and investing not money but time, energy, imagination, and information is encouraged. The author suggests an original guerrilla marketing model and reveals the peculiarities of guerrilla marketing approaches. The findings can help companies design innovative marketing strategies.

Keywords: innovative marketing; guerrilla marketing; entrepreneurship; guerrilla marketing tools

Reference to this paper should be made as follows: Išoraitė, M. 2024. Innovative marketing strategies in entrepreneurship. *Entrepreneurship and Sustainability Issues*, 12(2), 117-126. http://doi.org/10.9770/r8278778759

JEL Classifications: M20, M21, A20, A22, C40, C83, I21, L80

Additional disciplines sociology; information and communication

1. Introduction

Innovative marketing embraces various strategies. In this paper, we will focus on guerrilla marketing, which is described as a way to use as little as possible of a budget to achieve the most significant possible result in terms of marketing. According to Levison (1994), partisans do not fight in everyday battles; they use simple but effective tactics not carried out by professional soldiers but simply by armed civilians. Guerrilla marketing style requires a lot of energy and, at the same time, imagination because the whole strategy is about how to surprise and shock the user and, at the same time, generate as much social attention as possible from the public.

2. Review of literature

2.1. Guerrilla marketing features

Bigat (2012) mentioned that guerrilla marketing draws strength from creativity and imagination, which is different from traditional advertising. The maximum circulation level can be achieved using innovative materials and methods at the lowest cost. Bigat (2012) stated that guerrilla marketing is a powerful tool to quickly increase a company's competitive advantage, especially for small and medium-sized businesses in today's fiercely competitive markets.

Nufer et al. (2013) stated that guerrilla marketing is an alternative, holistic marketing method. According to the authors, the term embraces atypical and non-dogmatic marketing activities aimed at maximum results and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

possible impact with minimal investment. Nufer et al. (2013) mentioned that guerrilla marketing has evolved into a core strategy that includes the marketing mix, a central approach to marketing policy for the development of the market, which is consciously looking for new, unconventional, previously neglected, perhaps even frowned upon opportunities for deployment of tools.

Klepek et al. (2014) stated that guerrilla marketing tends to straddle the line between morality and ethics, with very little connection between 'ethical' and 'internet', 'viral', 'the web' or 'buzz' (which have been labelled as hot topics these days), while strategically unethical marketing actions can damage a company's or product's image while strengthening a competitor that is opposed to partisan goals.

Behal and Sareen (2014) stated that guerrilla marketing has become a strategy most often used for advertising. Moreover, the most popular ambient marketing methods are sensation, viral, buzz, and ambush. According to Behal and Sareen (2014), despite its many advantages, guerrilla marketing suffers from some negative things to consider before any guerrilla marketing campaign runs.

Damar-Ladkoo (2016) mentioned guerrilla marketing in specific terms, but all these definitions have some similar elements, which are: tactical approach, surprise effect, use of unconventional methods and ideas, and use of low budget; in addition, guerrilla marketing strategy surprises the customer and makes a lasting impression and guerrilla marketing campaign presents brands with a shocking, funny, unique, clever or creative image that gets people talking about it and is very similar to the military tactics from which it gets its name, operating on a small scale in terms of resources and relying more on tactical efforts, which here take on a more creative turn.

Khare (2017) mentioned that guerrilla marketing is an unconventional method, such as investing energy instead of money. Khare (2017) stated that guerrilla marketing is more about aligning marketers' creativity than marketing budgets.

Ahmed et al. (2020) analysed guerrilla marketing as an unconventional, low-cost marketing strategy dominated by high energy and imagination. It is an effective marketing strategy that excites consumers with surprises, sometimes with fun and excitement and leaves them with a memorable impact.

Wiryawan and Wardana (2020) state that guerrilla marketing involves surprise, humour, clarity of message, and creativity. According to Wiryawan and Wardana (2020), creativity is a dimension shaped by the novelty and relevance of each message sent, and the novelty and relevance are called the creativity variable. Lubytė (2020) mentioned that guerrilla marketing is based not on experience, judgment, or guesswork.

Šontaitė-Petkevičienė (2021) mentioned that guerrilla marketing is different from traditional marketing in that it is creative and allows you to achieve maximum turnover by spending the least amount of money as it can benefit innovative strategies and advertising tactics; the imperative part is the surprise that distinguishes it from traditional marketing, where ads are displayed in an unusual place in a strange environment that captivates the attention of consumers.

Xavier and Jayan (2021) mentioned that guerrilla marketing aims to create a high level of exposure to customers about products so that happy customers can spread word of mouth about the product; it can reach many and help promote the product you are selling, it is usually an inexpensive way to promote a product or service. Xavier and Jayan (2021) pointed those manufacturers must spend their precious time, energy, imagination, and innovative minds to promote the product. Xavier and Jayan (2021) stated that guerrilla marketing can be used by new and small businesses to promote their product when faced with heavy competition from larger companies.

Morfoulaki et al. (2022) mentioned that guerrilla marketing is a technique that uses alternative ways of communicating with a target group. It uses the surprise effect to create opportunities to promote an idea or project. Morfoulaki et al. (2022) stated that its main features are low cost, low budget needs, ingenuity and creativity.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

Azhar (2022) stated that guerrilla marketing is a marketing strategy that is widely used in the marketing mix, namely the aspect of advertising that attracts customers, so it requires innovative, effective, and efficient methods related to the cost factor; this is the goal of the guerrilla marketing concept to win the competition.

Barbosa et al. (2022) analysed guerrilla marketing as an advertising strategy in which the company uses surprise and unconventional interactions to promote a product or service. Barbosa et al. (2022) analysed that the term was coined by Jay Conrad Levinson in 1984, covering non-traditional marketing campaigns to overcome media saturation and achieve a high return on investment by dealing with a limited number of users in an affected, non-traditional, and an unexpected way that will drive target users spread the promotional message and finally draw the attention of a larger audience.

Khairusy et al. (2022) stated that guerrilla marketing is a type of advertising that focuses on low-budget, non-traditional marketing techniques that produce the best results to make a lasting impression on people by creating a shock effect.

Zarco and Herzallah (2023) analysed that guerrilla art seeks to raise awareness among individuals about broad issues without additional financial investment, while guerrilla marketing involves advertising and promoting individual products or services to increase sales and business income and pursue the common good through creativity displayed in public arenas prepared almost as a hobby at no cost to anyone.

Marasigan et al. (2023) stated that guerrilla marketing has not only succeeded in providing brands with unique and cool concepts but has also allowed artists to express their passion through guerrilla artist tactics. According to Marasigan et al. (2023), artists use the resources available to them in every possible way while giving them the artistic freedom to do their work. Marasigan et al. (2023) stated that another positive aspect of Guerrilla Marketing is its potential to multiply communications due to its creativity and uniqueness; it gives companies the freedom to conceptualise and convey the message they want in their advertising without compromising their budget.

Summarising the above ideas of scientists, it can be said that the peculiarities of guerrilla marketing are that guerrilla marketing draws strength from creativity and imagination in search of the new unconventional, including viral marketing, buzz marketing and ambush marketing, surprises the customer and leaves a lasting impression, delivers to brands shocking, funny, unique, clever or creative image, using unconventional methods, for example, investing energy instead of money, excites consumers with surprises, sometimes fun and excitement, leaves a memorable impact on them, includes surprise, humour, clarity and creativity of the message, the effect of surprise used to promote an idea, focused on low-budget, non-traditional marketing techniques, allowed artists to express their passion through guerrilla tactics.

2.1. Guerrilla marketing tools

Ay et al. (2010) mentioned that guerrilla marketing is a tool that allows the organisation to demoralise their competitors with small, periodic, and unexpected attacks; urgent action is required and uses creativity and imagination. According to Ay et al. (2010), through guerrilla marketing, companies seek to form a dynamic marketing management that is responsive to customer needs and can adapt to changes quickly. Today, the increasing variety of products and services and their similarity hurts business profits.

Wanner (2011) stated that the most effective guerrilla marketing campaigns are simple and unified with a well-placed message. According to Wanner (2011), when creating a campaign that unexpectedly conveys a message, agencies need to understand the importance of trying to deliver on a narrow agenda. Wanner (2011) stated that It is essential to pay attention not only to how to get the most attention for the brand but also how to do it in a way that is considered tasteful and appropriate for the whole audience, not just the target audience.

Shakeel and Khan (2011) stated that six main types of secret marketing techniques can be used to gain a competitive advantage, i.e., viral marketing, brand pushers, celebrity marketing (endorsement), bait and switch

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

marketing, video game marketing, and pop and rap music marketing. According to Shakeel and Khan (2011), these marketing techniques are based on many disguises, and it is worth noting that these marketing techniques, some of which are more covert than others, are an alternative technique proper to conventional marketing methods. Bigat (2012) states that guerrilla tactics are rational and can turn their disadvantages into advantages.

Fong and Yazdanifard (2014) considered that viral marketing is also called electronic and word-of-mouth marketing. According to the authors, direct marketing is a technique by which an organisation persuades the user online to send this advertising material by email. Fong and Yazdanifard (2014) stated that viral marketing relies on transmitting information from person to person. If many people forward something to many friends, overall growth will be rapid.

Wendland (2016) mentioned that guerrilla marketing does this not to compete with other marketing strategies in the mix but rather to complement the original tools. Wendland (2016) stated that guerrilla marketing greatly influences the communication region and also finds its main field of application. According to Wendland (2016), guerrilla marketing and its tools can be adaptively integrated into classical conceptual marketing systems as part of operational marketing planning and execution.

Balwani et al. (2017) considered guerrilla marketing a species of marketing communication (MC) that affects consumer behaviour. According to Balwani et al. (2017), the main objective of guerrilla marketing is to attract customers' attention using various means and methods, such as personal relationships, direct marketing, and unique advertising.

Balážiová and Spálová (2020) stated that according to the principle of guerrilla warfare, which is suitable for small companies, the "small company" tag is turned into an advantage because a small company with great flexibility (unlike large corporations) can be easily removed from the company. Market or change their product lines and management goals.

Xavier and Jayan (2021) stated that guerrilla marketing can be used by new and small businesses to promote their product in the face of heavy competition from larger companies. Xavier and Jayan (2021) mentioned that this is the way it affects the subconscious because purchasing decisions are a quick reflex of the unconscious mind. According to Xavier and Jayan (2021), new ways are introduced daily to attract and retain new customers.

Dubauskas and Išoraitė (2022) suggested that guerrilla marketing tools must be practical and appeal to target consumers and include:
a) Individual offer to buy;
b) Use a business card as an advertising tool. Business cards can also have an advertising function;
c) Personal email writing letters;
d) Advertisements. There are many ad portals on the Internet where you can post your ads for free, so you must take advantage of them.

In summary, it can be said that guerrilla marketing tools allow the organisation to demoralise competitors with small, periodic, and unexpected attacks to gain a competitive advantage, i.e., viral marketing, brand pushers, celebrity marketing (endorsement), bait and switch marketing, video games, attract customer attention through various means and methods such as personal relationships, direct marketing, unique advertising, used by new and small businesses to promote their product in a large against the competition of large companies, must be practical and attractive to target consumers and include: individual purchase offer, use of business card as an advertising tool, online advertising.

2.3. Guerrilla marketing and entrepreneurship

Okwara et al. (2017) considered that guerrilla marketing is also an effective way for companies that do not provide a tangible service to promote their products through non-traditional channels as long as they have an effective strategy. However, unlike traditional media, guerrilla marketing cannot be measured by statistics, sales

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

and hits but by profit. According to Okwara et al. (2017), it is designed to reduce the clutter of traditional advertising, and there is no mystery about what is being advertised.

Larbi et al. (2018) stated that considering the non-traditional guerrilla style of marketing is different from conventional marketing methods to inclusion of the set of ideas is unusual and surprising to the public, it carries out targeted legal attacks against competitors to influence customers, which means that he focuses on traditional marketing goals are profit and growth, but using exclusive advertising methods, which made small and medium enterprises a critical tool in addressing development external environment to deal with competitors through strategies for this kind of marketing techniques.

Onyango and Njeru (2018) mentioned that guerrilla marketing strategy also includes positioning, profitability, exclusive competencies, small market segments, adherence to the marketing concept, relationship marketing practice, and building a company reputation based on long-term mutual benefits for its customers. The study also noted that small companies must incorporate these ideas and become guerrilla marketers to compete in the markets where they dominate much more significant companies (gorillas).

Das et al. (2019) stated that to attract customers' attention, marketers have developed even more new tactics to get the most out of a small budget. Overall, the uniqueness of guerrilla marketing is that there's plenty of shock, outrage and clever techniques. This creates a significant impact and a memorable experience for users.

In their article, Yagboyaju and Chinedu (2021) mentioned that the guerrilla entrepreneur is a unique form of entrepreneurship with distinctive attributes and takes a positive enthusiast about success in his business adventures. According to Yagboyaju and Chinedu (2021), most guerrilla entrepreneurs think this business enterprise goal must be achieved, but not at the expense of a quality lifestyle businessman and his family. Business objectives are the key to the survival of any business enterprise, and so it is with guerrilla entrepreneurship. However, the guerrilla entrepreneur views his involvement in any business as a refreshing and exciting activity that should not cause stress. When it gets tense, then something is wrong with the business model.

Šontaitė-Petkevičienė (2021) stated that guerrilla marketing is a creative and low-budget marketing communication tool, a topic still understudied in the scientific literature. According to Šontaitė-Petkevičienė (2021), scientists say that this area needs more in-depth knowledge and tools to use guerrilla marketing creative and low-budget entrepreneurial marketing. This lack of theory begs the question not of whether the business of entrepreneurship should employ partisan marketing but how it should be used for their marketing communication to be creative and ensure a small budget.

Serazio (2021) analysed that based on guerrilla marketing theory, this article further documents how brand journalism evinces fundamental commercial self-effacement at its core – in mimicking journalistic style and substance – and thus portends a redefinition of advertising as a visible mass communication form.

Nufer (2021) mentioned that guerrilla marketing is achieving typical marketing objectives and unconventional methods, and basically, guerrilla marketing strives to be different and stand out. According to Nufer (2021), the goal is to achieve the most significant possible impact with a smaller budget (than usual in traditional marketing), which is why guerrilla marketing on the Internet is prevalent and suitable for the digital age.

Faddila and Sumarni (2023) noted that guerrilla marketing must first go through brand awareness to influence purchasing decisions; brand awareness can also affect buying mixed products. Therefore, efforts should be made to increase consumer awareness of mixed products so that guerrilla marketing can influence purchasing decisions.

Although guerrilla marketing received much attention from scientists, there is still a gap since a model of guerrilla marketing in entrepreneurship is not suggested, and the peculiarities of guerrilla marketing in entrepreneurship are not systematised. The author tackles these gaps.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

The scientific issue is formulated by the research question: what are guerrilla marketing and entrepreneurship features? *The research aims* to present a novel model of guerrilla marketing and suggest a systemised approach to different strategies.

3. Research methodology and findings

As mentioned above, the author employed a review of literature and case studies to answer the posed research questions.

3.1. The guerrilla marketing model in entrepreneurship

The guerrilla marketing model in entrepreneurship (see Figure 1) involves promoting its products through non-traditional channels, being unusual and surprising to the public, conducting targeted legal attacks against competitors to influence customers, using relationship marketing practices, building a company reputation based on long-term mutual benefits for customers, applying new tactics, how to get the most out of a small budget, a refreshing and exciting activity that should not cause stress, creative and low budget marketing communication, a tool to achieve conventional marketing goals with unconventional methods, guerrilla marketing must first go through brand awareness to influence the purchase decision.

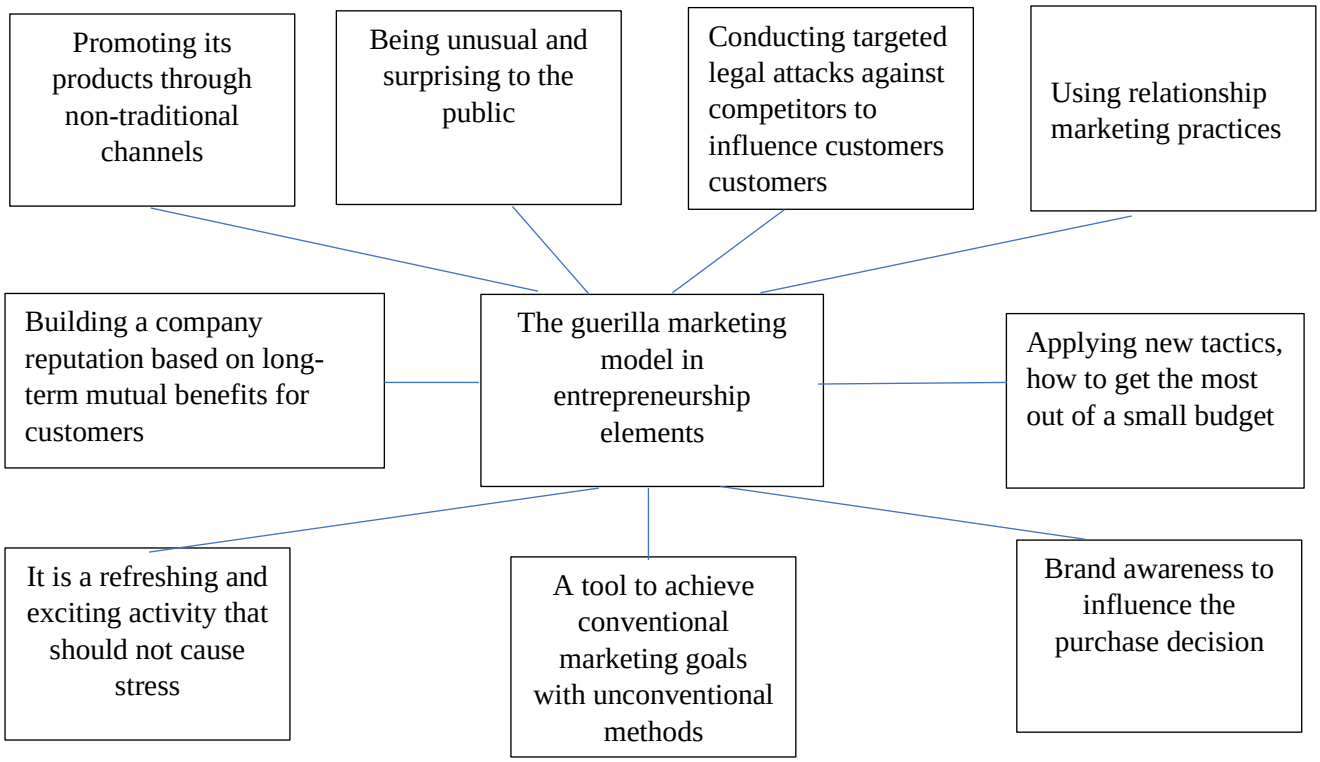


Figure 1. The guerrilla marketing model in entrepreneurship

3.2. Guerrilla marketing and entrepreneurship case study results

Red Bull gives you "wings" through guerrilla marketing

Red Bull is everywhere: extreme sports events, concerts, races, competitions. The beverage company focuses its marketing efforts more on events than on advertising the unique taste of taurine, which is one of the main ingredients of this drink. In the early 1980s, Dietrich Mateschitz, while visiting Thailand (he worked in sales for the German brand Blendax), heard about an "energy tonic" that kept people awake and alert. He collaborated

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

with a local small pharmacist, Chaleo Yoovidhya, to create a unique recipe. After three years of hard work, Red Bull was created. Nowadays, Red Bull has the largest share of the energy drink market worldwide. Red Bull's target audience is 16 and 30 years old, both male and female (though initially more prevalent among men); income: high; duties: from students to senior professionals; personality: ambitious.

Intended benefits of the drink: better performance and a sense of belonging.

Red Bull's soaring success, "Red Bull gives you wings", is more than just a catchy slogan; it is a testament to the brand's ability to inspire individuals to reach new heights. With visionary leadership, creative marketing and engaging content, Red Bull has transformed itself from a humble energy drink into a global lifestyle brand. The next time you enjoy a can of Red Bull, enjoy the knowledge that you are part of one of the most fabulous branding and marketing success stories of all time (Hiivala, n.d.)

UNICEF's Dirty Water Vending Machines

This guerrilla marketing campaign by the aid organisation UNICEF caused a stir. It asked, "What if those water bottles you're wasting money on are filled with dirty water?" It reminded the privileged masses that entire populations lack access to clean drinking water in too many parts of the world. More than 4,000 children die every day from diseases caused by the consumption of unsafe drinking water. Around the world, an estimated 780 million people lack access to clean water, but many people are unaware of the scale of this crisis. UNICEF wanted to change that. In 2009, they partnered with Latinx ad agency Casanova Pendrill/McCann to create a guerrilla marketing gimmick that garnered global media attention: Dirty Water vending machines. Vending machines in New York's Union Square offered eight water "flavours": cholera, malaria, typhoid, dysentery, dengue, hepatitis, salmonella, and yellow fever (all diseases affecting communities without clean drinking water). For a $1 donation to UNICEF, New Yorkers received a nasty brown water bottle with unrecognisable particles and some essential facts about the water crisis. They were informed that their donation of $1 could provide a child with clean drinking water for 40 days. (Guerrilla Marketing Example #2: UNICEF “Dirty Water” Campaign)

The Bubble Waffles

The bubble waffle is a registered and globally recognised waffle format. These waffles became popular in Hong Kong, so in some parts of the world, they are called Hong Kong waffles, and waffles with ice cream are called Hong Kong ice cream. Such waffles can be eaten alone, but they are usually more street food, not only in Lithuania. All over the world, they are supplemented with various additives: cream, ice cream, syrups, fruits, and sweets. The waffle itself, despite its traditional recipe, can be coloured by adding berries or jam, adding juice or adding matcha green tea powder. These waffles are unique because they are easy to roll and add toppings. Plus, they always look great in photos.

Case studies have shown that guerrilla marketing is a creative and unconventional approach to advertising and promotion that aims to capture the public's attention and imagination through surprise, innovation and audacity. Guerrilla marketing is a strategy that relies on unconventional, creative and often surprising techniques to promote a product, service or brand. It's named after guerrilla warfare, where small, resourceful groups use unconventional tactics to defeat more prominent, more powerful opponents. Red Bull gives you "wings" guerrilla marketing aimed at achieving maximum impact with minimum resources. UNICEF's Dirty Water Vending Machines and Ice Cream guerrilla advertising uses surprise and personal engagement to connect with their target audience. It's about finding unique ways to stand out in a crowded market.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r8278778759

Table 1. Results of the case studies analysis guerrilla marketing and entrepreneurship features

Peculiarities / Case study	***Red Bull gives you "wings"***	***UNICEF's Dirty Water Vending Machines***	***The Bubble Waffles***
Marketing campaign year	1996-2006	2009	2024
Target audience	Young people	Wider society	Wider society
Goal of the campaign	To develop and support the promoted idea	To encourage changes in behaviour	To encourage buying ice cream
Specific features	Strong emotional response	Strong emotional response	Publicity
Marketing theory	Sound action theory	Social cognitive theory	Theory of reasonable action

Above in Table 1, a systemised approach to different strategies is suggested.

Conclusions

A novel model integrating features of guerrilla marketing is suggested. This innovative strategy is based on time, creativity, ideas, energy and knowledge. Guerrilla marketing is a low-budget approach to marketing that relies on ingenuity, intelligence and surprise rather than traditional techniques. Case studies' analysis showed that different companies used differently designed marketing strategies, which allowed them to distinguish peculiarities.

The novelty of the article is that the article presents a model of guerrilla marketing in business based on scientific literature and analyses cases of guerrilla marketing. The systemisation of the peculiarities of case studies contributes to the understanding of innovative strategies and typologies. The results can be instrumental to small and large companies in designing their contemporary marketing strategies.

References

Ahmed, R. R., Qureshi, J. A., Štreimikienė, D., Vveinhardt, J., & Soomro, R. H. (2020). Guerrilla marketing trends for sustainable solutions: evidence from SEM-based multivariate and conditional process approaches. *Journal of Business Economics and Management*, 21(3), 851-871. https://doi.org/10.3846/jbem.2020.10730

Ay, C., Aytekin, P., & Nardali, S. (2010). Guerrilla Marketing Communication Tools and Ethical Problems in Guerrilla Advertising. *American Journal of Economics and Business Administration*, 2(3), 280-286. https://doi.org/10.3844/ajebasp.2010.280.286

Azhar, R.M. (2022). The Effectiveness of Guerrilla Marketing for Small Business: A Systematic Literature Review. *Journal of Economics, Finance and Management Studies*, 5(11), 3219-3225. https://doi.org/10.47191/jefms/v5-i11-11

Balážiová, I., & Spálová, L. (2020). Terminological and historical background of guerrilla marketing as a marketing communication strategy. *Social Communication*, 1, 81-92 https://doi.org/10.2478/sc-2020-0009

Balwani, S., Aulia, S., & Sen, N. (2017). A Study on Awareness Levels of Guerrilla Marketing Techniques among Select Young Adults in Muscat- Sultanate of Oman. *International Journal of Research in Business Studies and Management*, 4(7), 24-29.

Barbosa, B., Rocha, A., & Pina, L. (2022). Guerrilla marketing on Facebook: A mixed-method study on the effects on brand image and content sharing intentions. T*ourism & Management Studies*, 18(2), 37-47. https://doi.org/10.18089/tms.2022.180303

Behal, V., & Sareen, S. (2014). Guerrilla marketing: a low cost marketing strategy. *Int. J. Mgmt Res. & Bus. Strat*., 1-5.

Bigat, E. C. (2012). Guerrilla advertisement and marketing. Procedia - Social and Behavioral Sciences, 51, 1022-1029. https://doi.org/10.1016/j.sbspro.2012.08.281

Damar-Ladkoo, A. (2016). Guerrilla marketing of fresh organic agricultural products. *Theoretical Economics Letters*. https://doi.org/10.4236/tel.2016.62027

Das, J., Jagga, P., & Choudhury, R. R. (2019). Guerrilla marketing-small money big reach. *JETIR*, 6(7)

Dubauskas, G., & Išoraitė, M. (2022). Guerrilla marketing tools in financial service organisations. *Independent Journal of Management & Production (IJM&P)*, 13(2) https://doi.org/10.14807/ijmp.v13i2.1568

Guerrilla Marketing Example #2: UNICEF "Dirty Water" Campaign https://brogan.com/blog/guerrilla-marketing-example-2-unicef-dirty-water-campaign/

Faddila, S., P., & Sumarni, N. (2023). How Does Mixue's Guerrilla Marketing Influence Purchasing Decisions? Mediation Analysis of Brand Awareness In Higher Education Students. *West Science Business and Management*, 1(5), 451-458. https://doi.org/10.58812/wsbm.v1i05.508

Fong, K., & Yazdanifard, R. (2014). The Review of the Two Latest Marketing Techniques; Viral Marketing and Guerrilla Marketing which Influence Online Consumer Behavior. *Global Journal of Management and Business Research: E Marketing*, 14(2)

Hiivala, J. (n.d.) How did Red Bull get its wings? How Bold Branding and Ingenious Marketing Created an Energy Drink Empire https://www.wildepine.com/blog/the-red-bull-phenomenon-how-bold-branding-and-ingenious-marketing-created-an-energy-drink-empire

Khairusy, M., A., Hurriyati, R., Dirgantari, P., & Haryadi, D. (2022). Guerrilla Marketing in Higher Education the Creative Promotion for Student Purchase Intention. Proceedings of the 7th Global Conference on Business, Management, and Entrepreneurship (GCBME 2022), 569-576. https://doi.org/10.2991/978-94-6463-234-7_58.

Khare, A. K. (2017). Guerrilla Marketing - Innovative and Futuristic Approach towards Marketing. *International Journal of Advanced Engineering, Management and Science (IJAEMS)*, 3(5), 421-426. https://doi.org/10.24001/ijaems.3.5.3

Klepek, M. (2014). Guerrilla marketing concept and further research possibilities. *Acta Academica Karviniensia*, 9(3), https://doi.org/10.25142/aak.2014.050

Larbi, B., M., Amel, B., & Asma, Y. (2018). The role of guerrilla marketing in increasing the competitiveness of small and medium enterprises. Proceedings of 182nd The IIER International Conference, Cairo, Egypt, 12th -13th August, 2018.

Levinson, J. C. (1994). The guerrilla marketing handbook, 396p.

Lubytė, V. (2020). Small and Medium Enterprises Brand Positioning Through Guerrilla Marketing Principles. 5th Prof. Vladas Gronskas International Scientific Conference. Kaunas: Vilnius University Kaunas Faculty, 3rd of December, 2020.

Marasigan, S., R., U., Navarro, J., F., Palanca, P., M., & Pantoja, E. E. (2023). The Effects of Guerrilla Marketing in Small and Medium-Sized Enterprises in Metro Manila, Philippines. *Journal of Economics, Finance and Management Studies*, 6(1), 523-536. https://doi.org/10.47191/jefms/v6-i1-56

Morfoulaki, M., Myrovali, G., & Chatziathanasiou, M. (2022). Exploiting Marketing Methods for Increasing Participation and Engagement in Sustainable Mobility Planning. *Sustainability*, 14, 4820. https://doi.org/10.3390/su14084820

Nufer, G. (2013). Guerrilla Marketing - Innovative or Parasitic Marketing? *Modern Economy*, 4, 1-6. https://doi.org/10.4236/me.2013.49A001

Nufer, G. (2021). Innovative Digital Guerrilla Marketing. *International Journal of Innovation, Management and Technology*, 12(3) https://doi.org/10.18178/ijimt.2021.12.3.907

Onyango, H., O., & Njeru. A. (2018). Influence of guerrilla marketing strategy on performance of small and medium retail enterprises in Kenya. *International Journal of Social Science and Humanities Research*, 6(2), 311-318. www.researchpublish.com.

Okwara C. C., Nkwocha, C. A., & Linus, O. (2017). The Impact of Guerrilla Marketing on the Sales Performance of Entrepreneurs (A Case of Alaba International Market). *International Academic Journal of Management and Marketing*, 9(1), 103-116. www.africaresearchcorps.com

Serazio, M. (2021). How news went guerrilla marketing: a history, logic, and critique of brand journalism. *Media, Culture & Society*, 43(1), 117-132. https://doi.org/10.1177/0163443720939489.

Shakeel, M., & Khan, M. M. (2011). Impact of Guerrilla Marketing on Consumer Perception. *Global Journal of Management and Business Research*, 11(7)

Šontaitė-Petkevičienė, M. (2021). Guerrilla marketing: a creative and small budget approach to entrepreneurial marketing. *Research for Rural Development*, 36, 218-225. https://doi.org/10.22616/rrd.27.2021.031

Xavier, L., & Jayan, V. L. (2021). The Guerrilla Marketing Technique. *Perspectives on Business Management & Economics*, 4, 138-143. http://www.pbme.in/papers/133.pdf

Wanner, M. (2011). More Than the Consumer Eye Can See: Guerrilla Advertising From an Agency Standpoint. *The Elon Journal of Undergraduate Research in Communications*, 2(1), 103-109.

Wendland, L. (2016). A common ground in Guerrilla Marketing – State of research and further research opportunities. *Junior Management Science*, 1, 34-50.

Wiryawan, G. N. D., & Wardana, M. (2020). The influence of guerrilla marketing on word-of-mouth activities mediated by advertising credibility – study on Generation Z in Denpasar. *American Journal of Humanities and Social Sciences Research (AJHSSR)*, 4(11), 49-60.

Yagboyaju, K. A., & Chinedu, I. H. (2021). Effect of Guerrilla Marketing on Guerrilla Entrepreneur Performance: A Study of Selected Businesses in Nigeria. *International Journal of Science and Management Studies (IJSMS)*, 4(2) https://doi.org/10.51386/25815946/ijsms-v4i2p107

Zarco, C., & Herzallah, D. (2023). Guerrilla Marketing in the 21st Century: A Systematic Analysis of the Discipline Through a Literature Review, a Taxonomy, and Identification of the Most Relevant Variables. *Preprints*, 2023030169. https://doi.org/10.20944/preprints202303.0169.v1

Margarita IŠORAITĖ. Doctor of Social Sciences at Vilnius Gediminas Technical University, the name of the associated professor, was given at Mykolas Romeris University in Lithuania. Associated professor at Vilnius kolegija/ University Applied Sciences. Research interests: human resource management, strategic marketing, marketing management, advertising, entrepreneurship.
ORCID ID: https://orcid.org/0000-0001-9108-0525

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

Publisher
http://jssidoi.org/esc/home

UNVEILING THE RESILIENCE OF CREATIVE BUSINESS: NAVIGATING THE IMPACT AND RECOVERY PATH OF COVID-19 IN BULGARIA*

Stanimir Stamatev [1], Miglena Angelova [2]

[1,2] University of National and World Economy, 8 Dekemvri str., 1700 Sofia, Bulgaria

E-mails: [1] sstamatev@unwe.bg; [2] m.angelova@unwe.bg

Received 20 August 2024; accepted 14 October 2024; published 30 December 2024

Abstract. The primary objective of the current research is to identify the impact that COVID-19 had on the Creative Business in Bulgaria and their first steps for recovery from the crisis. Our research is based on official and reliable Bulgarian National Statistical Institute data. Based on the number of employed persons, the sectors most affected by COVID-19 in the creative business are sound recording and music publishing, photography, and advertising. For the period 2017-2022, there has been a slowdown in the growth rate of gross wages in the creative industries. This slowdown is most noticeable in 2019 and mainly in 2020, followed by a smooth and gradual recovery. At the same time, creative business companies in Bulgaria received the most extensive support in terms of public funding in 2020. The most generously supported sectors in 2020 within the Creative Industries are Advertising, followed by the Production and distribution of films and television shows and Computer Programming. The Creative Business companies in Bulgaria demonstrated relatively good sustainability and adaptability during and after the COVID-19 crisis. The rates in profit change confirm the serious negative impact of the pandemic (results in 2019 and 2020). Still, at the same time, it reveals a good level of resilience and recovery of the companies (results for 2021 and 2022).

Keywords: Creative Industries; Creative Business; Recovery; Post-COVID situation

Reference to this paper should be made as follows: Stamatev, S., Angelova, M. 2024. Unveiling the Resilience of Creative Business: navigating the impact and recovery path of COVID-19 in Bulgaria. *Entrepreneurship and Sustainability Issues*, 12(2), 127-147. http://doi.org/10.9770/h3222498933

JEL Classifications: M00, M14, O31, O33

1. Introduction

The COVID-19 pandemic of 2019-2020 ushered in an unprecedented era of global disruption, leaving virtually no sector untouched. Among the hardest hit were the creative industries, comprising diverse fields such as arts, entertainment, media, design, and fashion, but also part of the IT sector (responsible for e-games), architecture, etc. Renowned for their dynamism and ability to reflect and shape societal trends, these industries grappled with many challenges as the pandemic unfolded.

The outbreak of COVID-19 triggered a cascade of repercussions across the creative landscape, disrupting production processes, decimating revenue streams, and challenging the very essence of artistic expression. Lockdown measures, social distancing protocols, and the abrupt halt of live events brought about a seismic shift in how creativity was produced and consumed. The closure of theaters, galleries, and performance venues left artists, performers, and creators in limbo, confronting profound uncertainties about their livelihoods and the future of their craft.

* *The present article is published with the financial support of the University of National and World Economy*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

Yet, amidst this upheaval, the creative industries also exhibited remarkable resilience, harnessing innovation, adaptability, and digital platforms to navigate the tumultuous terrain of the pandemic era. Virtual performances, online exhibitions, and digital collaborations emerged as lifelines, fostering connections between creators and audiences in ways previously unimagined. The crisis sparked a wave of creativity, with artists and innovators rising to the challenge, redefining traditional paradigms, and forging new pathways.

As we embark on the journey of understanding the impact of COVID-19 on the creative industries and charting a course for recovery, it becomes imperative to delve into the multifaceted dimensions of this transformative period. This scientific article explores the nuanced interplay between the pandemic and the creative ecosystem, examining the profound disruptions, adaptive responses, and emergent trends that have shaped its trajectory.

Based on the comprehensive analysis of the official results achieved by Bulgarian companies in creative industries during these turbulent years of the pandemic and followed by the economic crisis, we will be able to understand the effect that the pandemic had on different economic sectors within the creative industries on a national level and at the same time – to assess the impact on the financial support provided by responsible governmental authorities to these companies.

2. Literature review

The COVID-19 pandemic and all measures taken as a precaution against the spread of disease and social isolation for a very long time seriously negatively impacted economic life in almost all sectors and all levels – regional, national, and global. Companies in Culture and Creative Industries (CCI) were also generally negatively affected (except the IT sector), and several years after this huge crash, some of the enterprises in these industries still cannot fully overcome the consequences that the pandemic crisis has brought. Therefore, the interest in this specific topic from the scientific point of view is logical, even if the discussion is not very lively and comprehensive. This topic gained the most interest in 2022. Still, this could be considered a weakening discourse, missing the effect and changes the pandemic imposes on people and companies in the midterm period.

2.1. Crisis overcoming approaches in creative industries

Khlystova, Kalyuzhnova and Belitski (2022) made a systematic literature review covering 59 papers and argued that according to the exploring papers, COVID-19 had positive implications for IT and Software companies but at the same time, negative – for music industries, all culture calendar and events, festivals etc. Peñarroya-Farell and Miralles (2022) claim that a considerable number of enterprises have endured the ramifications of the pandemic through the introduction of redesigned business models, which have yielded novel value propositions in light of adverse environmental conditions. These firms have undertaken a strategic approach to crisis management by flexibly adjusting their business frameworks. Langevang et al. (2022) pinpointed and identified three strategies people use in creative fields to navigate uncertain circumstances: going digital, diversification, and active social focus and engagement. According to Fahmi, Krismiyaningsih, Sagala and Rustiadi (2023), the arts and culture-oriented creative sectors possess intrinsic capabilities enabling them to sustain their business following calamitous events, notably encompassing creativity, adeptness in sustaining market segments and a commitment to cultural preservation and empowerment. Authors also believe that it is crucial to leverage these capabilities to acquire new knowledge and discern opportunities conducive to bolstering resilience. While external aid plays a pivotal role in fortifying resilience, particularly in mitigating physical damages and losses, the onus ultimately rests on business proprietors to organize their enterprises effectively to confront emergent challenges (ibid).

Eletxigerra, Caldeira and Kastenholz (2023) proposed a cost-benefit approach for the wine tourist sector, based on the creative activities for customers as one of the possible solutions for overcoming the negative impact of COVID-19. Again, for tourism, this time focused on the direct connection in the line intangible heritage – creative industries – UNESCO creative cities, is devoted to interesting research, developed by Arcos-Pumarola, Paquin and Sitges (2023). At the same time, Viganò, England and Comunian (2023) outline the

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

role of a creative ecosystem based on a cluster as an interesting tool for developing local industries, crafts and culture.

Rius-Ulldemolins and Díaz-Solano (2023) explore the role of creative and cultural cities and changes in their development strategies. They study the new cultural approach of Valencia (Spain); the authors admit that notwithstanding the aspiration for a more culturally inclusive approach by the newly established government and the narrative of social participation underpinning these initiatives, their trajectory primarily gravitates towards urban branding endeavours. Kim (2023) also explores the connection between local governments and arts and culture development and concludes that the establishment of a structured governance framework, coupled with sustained technical support, enabled local arts organizations to advocate for their organizational interests and requirements effectively, as well as to address the broader needs of their community through negotiation.

2.2. Pandemic and its reflection on creative people

Shaughnessy et al. (2022) explore the effect that COVID-19 had on the people working in the creative business, and through thematic analysis, they outlined three general and important themes: pandemic precarity and creative practice, inclusivity and diversifying audiences, and adapting, developing, and disrupting cultural practices. These subjects depict an emerging workforce in the early stages of their careers, demonstrating dedication and involvement in their creative pursuits. Simultaneously, they desire a more equitable, just, and diverse industry that safeguards artists' interests and engages with audiences more flexibly (ibid). Duarte and Gauntlett (2022) explore the reactions of creative people during and after the pandemic and draw interesting conclusions. According to them, initially, the exigencies of the period prompted individuals to cultivate novel concepts of their creative self-identity. Subsequently, amidst the pandemic, many discovered a profound resonance with nature and outdoor environments, finding solace and inspiration therein. Lastly, the foremost challenges encountered by these individuals were predominantly associated with maintaining mental well-being and securing financial stability. Tønnessen, Dhir and Flåten (2021) suggest that internal and external digital knowledge sharing are substantial predictors of creative performance within remote work during the COVID-19 pandemic.

Nagayama (2023) investigated the interplay among multi-locational work, features of work locations, and various worker outcomes, including engagement, creativity, and well-being. The research findings revealed a positive correlation between multi-locational work and all examined outcomes, with the strongest association evident in creativity. Moreover, according to the author, the diversity of location features, as perceived in work and non-work activities, augmented the positive relationship between multi-locational work and creativity. Scholars also admit that non-work flexibility partially mediates the connection between multi-locational work and creativity and well-being (ibid). Srivastava, Murnane, Billington and Samuelson (2024) analyzed the work performance in home versus office. Their findings suggest a noteworthy disparity in perceived work performance between office and home settings, with the former yielding significantly higher ratings. Conversely, comfort and well-being were reported to be considerably higher in the home environment, according to their results. Logistic regression analyses underscored temperature, noise levels, workstation furniture quality, and aesthetic considerations as the foremost predictors of perceived work performance (ibid).

2.3. Sustainability and future development of creative business

Anjaningrum, Azizah and Suryadi (2024) argue that the implementation of Business Intelligence is projected to play a pivotal role in enhancing the performance of Small and Medium Enterprises, with organizational learning serving as a mediating factor. Furthermore, their research findings affirm the existence of serial mediation, indicating that organizational learning and subsequent innovation mediate the relationship between business intelligence and SME performance. However, the significance of network learning and innovation cannot be understated, given their substantial direct influence on SME performance.

The role of Artificial Intelligence (AI) is also recognized by scientists for securing sustainability in creative industries. Amankwah-Amoah et al. (2024) claim that in contrast to various industrial sectors, where AI predominantly serves to automate repetitive tasks, creative practitioners have the opportunity to employ genera-

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

tive AI as a collaborative instrument, facilitating the exploration of novel creative pathways, streamlining operational procedures, and expediting creative workflows. The authors also pointed out that preserving the human element and the authenticity inherent in the outputs of the creative sectors poses a notable challenge for both the industry and broader societal contexts (ibid). Ivcevic and Grandinetti (2024) also consider AI an essential and helpful tool that could help creative people and different practitioners in their everyday tasks, supporting their level of creativity. In the line of closed relation between AI and creative industries comes the research of Hattori, Yamakawa and Miwa (2024), who explore the human bias in evaluating the products created by AI. Their study revealed a tendency towards assigning lower creativity ratings specifically to highly functional products when they were identified as being generated by AI. According to authors, this bias was notably pronounced among individuals who perceived a heightened threat stemming from generative AI technologies. They also underscore the significance of both product attribute quality and the identity of the producer in shaping perceptions of creativity (ibid). O'Toole and Horvát (2024) explore various methods to develop AI tools to enhance human creativity and enable users to participate fully and authentically in creative endeavours. According to researchers, these approaches encompass utilizing AI models to provide insights into various facets of the creative process, crafting interfaces that foster the exploration of ideas, and devising technological features that facilitate the emergence of novel creative methodologies (ibid). Tsao et al. (2024) go further in the relationship between AI and human creativity – they propose a comprehensive framework delineating the potential pathways through which artificial intelligence could progress and accumulate scientific and technological knowledge. This architectural model draws inspiration from contemporary viewpoints on how human intelligences evolve and accrue such knowledge (ibid).

Malik, Wei, Appel and Luo (2023) explore the role of blockchain technology in creative industries, arguing that this could lead to changes and different benefits for companies in these industries from strategic perspectives. Blockchain technology is also considered a useful tool for developing the recorded music industry in the Internet of Musical Things (Turchet and Ngo, 2022). Zhang, Wang and Cai (2023) explore the role of blockchain in copyright judicial practice. They admit that blockchain technology offers several functional benefits, including distributed storage, hash function verification, and timestamping, which confer upon it technical attributes such as stability, integrity, and immutability. Consequently, according to the authors, blockchain technology presents a viable solution to the challenges surrounding electronic evidence, particularly its susceptibility to distortion and modification and the complexities associated with its collection. This is particularly pertinent in copyright disputes, where establishing ownership of works and securing evidence can be arduous tasks (ibid).

Interesting aspects of gaining sustainability and future development both on individual and organizational levels are also developed by Culpepper and Gauntlett (2024); Tang, Xu, Mao and Naumann (2024); Gong, Yu and Hassink (2023); Borre, Romero, Gutiérrez and Ramírez (2023); Katz et al. (2022); Dimcheva and Stoyanov (2023) and others.

Javaid, Haleem, Singh and Sinha (2024) summarized that the ongoing digitalization of the economy fundamentally reshapes the delivery and consumption dynamics of products and services. Authors admit that Industry 4.0 initiatives are emerging as a guiding framework, offering a roadmap for numerous sectors to transition from traditional practices towards embracing the new paradigm. They also pointed out that within the digital economy, there is a notable shift towards scalable and integrated ecosystems facilitated by software platforms, which are instrumental in generating value, fostering resilience, and catalyzing innovation through the interconnectedness of goods, assets, personnel, and processes. This transition swiftly replaces antiquated, linear value chains with collaborative partnerships and networked participation (ibid).

In summary, from the literature review, the important processes that push forward the development of the economy nationally, regionally and globally are equally crucial for developing the creative industries. Undoubtedly, the development of artificial intelligence will have a very strong impact on the overall development of creativity, including at the organizational and individual levels. At the same time, the ongoing and deepening digitization will penetrate more and more comprehensively into sectors of the cultural industries that, only a few years ago, we could hardly have imagined would be digitized. All of this provides opportunities to build sustainability and, to some degree, the readiness of companies in the creative business to successfully recover

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

and overcome the negative consequences of the pandemic, including relying on the implementation of innovations and strengthening human-machine interaction along the lines of creativity.

3. Methodology of the research

The major objective of the current research is to identify the impact that COVID-19 had on the Creative Business in Bulgaria and their first steps for recovery from the crisis. We wanted to base our research on official and reliable data, so we turned to representatives of the National Statistical Institute (NSI) in Bulgaria for support. For this purpose, we initiated a series of meetings with representatives of the NSI to specify the parameters of our cooperation in the specific research field. The data we work with has been provided by NSI specifically for our research team and is derived from annual data contained in the annual reports on the activity of non-financial enterprises composing the balance sheet at the country level, which is classified according to the NACE.BG-2008 for the years 2017-2022 - in thousand BGN (1 BGN equals 1.95583 Euro).

For our research, we use data provided by Bulgarian enterprises from 11 sectors of the national economy, which fall under the scope of creative industries (Table 1).

Table 1. Economic sectors within the Creative Business included in the research

Code by NACE.BG-2008	Name of position
58.11	Publication of books
58.21	Publishing of computer games
59.1	Production and distribution of films and television shows
59.2	Sound recording and music publishing
60	Radio and television activity
62.01	Computer programming
71.11	Architectural activities
73.1	Advertising activity
74.1	Specialized design activities
74.2	Activities in the field of photography
90	Artistic and creative activity

We chose to study six years, from 2017 to 2022 inclusive. In this way, we should have basic data on how businesses from the creative industries developed in the years before the pandemic (2017-2019), how the pandemic and all social isolation and lockdown measures affected them (2020-2021), as well as the first steps of recovery (2022). In all figures used in the next part of the research, when we present the change in different financial parameters of the enterprises, the base year is 2017.

When we explore this period and its reflection on the creative business at the national level, we should consider the following specific information related to Bulgaria and the COVID-19 pandemic.

On March 13, 2020, the national government declared a state of emergency throughout the country for one month, which was extended from April 3 until May 13, 2020. From May 14 to June 14, an extraordinary epidemic was declared, extended several times. On March 30, 2022, the Council of Ministers decided that from April 1, the emergency epidemic situation is cancelled. Throughout this period, various measures imposing social isolation were in force in Bulgaria - from a complete lockdown and a ban on the gathering of people, even in small groups, to various opportunities for the realization of a timid social and cultural life.

For this period, we have cumulative official data on the income-expenditure reports of the Bulgarian enterprises within the creative business in these 11 sectors of the economy, presented above.

The methodological steps of our research are presented in Table 2.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

Table 2. Methodological steps of research

Methodological steps and activities	
Step 1	***Identification of the major parameters of the research***
	- Determining the main objective of the study - Defining the main tasks and sub-tasks to achieve the objective - Determining the scope of the research, major target group (Bulgarian enterprises in Creative Industries) and the way to obtain reliable information from the target group
Step 2	***Establishing cooperation with representatives of Bulgarian National Statistical Institute (NSI)***
	- Initiation of a series of meetings with representatives of NSI to establish parameters of cooperation in the specific field of scientific research - Defining the scope of partnership - Receiving reliable official information
Step 3	***Data Analysis***
	- Analyzing the official data provided by the NSI - Outline the main trends related to the change in the incomes and expenditures of the enterprises of the Bulgarian Creative Business - Outline the main trends related to the change in rate of employment in Bulgarian Creative Business - Outline the effect from the governmental financial support for the Creative Business and its reflection on the different sectors within the Creative Business
Step 4	***Quantitative Analysis***
	- Employ statistical methods to analyze trends and patterns in the NSI data, utilizing different techniques. - Assess the differential impact of the COVID-19 pandemic across various segments of the creative industries, covering all 11 sectors. - Evaluate the magnitude of disruptions caused by the pandemic, including changes in employment levels, revenue streams, and production output.
Step 5	***Synthesis and Interpretation***
	- Synthesize quantitative findings to develop a comprehensive understanding of the multifaceted impact of COVID-19 on the creative industries. - Interpret results within the broader context of economic, social, and cultural dynamics. - Identify key drivers of resilience and recovery within the creative ecosystem, offering insights into policy interventions, institutional support mechanisms, and strategic initiatives to foster sustainable growth and innovation post-pandemic.

4. Data Analysis

For the purposes of our research and in accordance with the data received from the NSI on the performance of Bulgarian enterprises working in the Creative Industries, we will take a deeper look at the results, changes and trends for the period from 2017 to 2022 according to the following several main parameters: number of employees persons in the Creative Industries, average gross salary in the creative sector, change in income, change in expenditure and change in profit in the eleven sectors that form the creative business at national level.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

4.1. Employment Rate in the Creative Industries

Table 3. Number of employees working in Creative Business in Bulgaria,

Sector	2017	2018	2019	2020	2021	2022
Publication of books	1 130	1 088	1 156	1 151	1 196	1 282
Publishing of computer games	130	123	129	158	180	182
Production and distribution of films and television shows	3 895	5 046	4 381	3 970	4 195	4 201
Sound recording and music publishing	484	525	525	426	422	478
Radio and television activity	2 946	2 835	2 782	2 637	2 515	2 391
Computer programming	17 817	19 777	21 535	23 237	26 849	31 705
Architectural activities	4 234	4 379	4 562	4 432	4 535	4 712
Advertising activity	9 454	9 472	9 545	8 353	8 505	8 694
Specialized design activities	1 615	1 767	1 925	1 972	2 125	2 254
Activities in the field of photography	1 483	1 514	1 618	1 429	1 401	1 504
Artistic and creative activity	1 657	1 670	1 842	1 532	1 680	1 867
Total	**44 845**	**48 196**	**50 000**	**49 297**	**53 603**	**59 270**

Source: National Statistical Institute (NSI)

As can be seen from the table above, the largest sector in terms of employment is Computer programming, which generated impressive growth during the considered period. In second place comes Advertising activities, but according to the data, this sector is seriously affected by the COVID pandemic and shows a decrease in the number of employees occupied with advertising activity. At the bottom, according to the number of people working in the sector, the Sound recording and music publishing sector was also negatively affected by the crisis.

Interesting findings could be made based on the data in the table. Firstly, obviously, 2020 was very hard for the major companies in Creative Industries in Bulgaria. Out of all 11 surveyed sectors, only 3 – Publishing of computer games (22,5%), Computer programming (7,9%) and Specialized design activities (2,4%) recorded an increase in the number of employed persons in 2020, while in all others there were various levels of decline. At the same time, the serious negative effect between 2019 and 2020, according to the number of employed persons, is observed in Sound recording and music publishing (-18,9%), followed by Activities in the field of photography (-16,8%) and Advertising activity (-12,5%). The cumulative change in employment rate for all sectors within the Creative Industries is presented in Fig. 1.

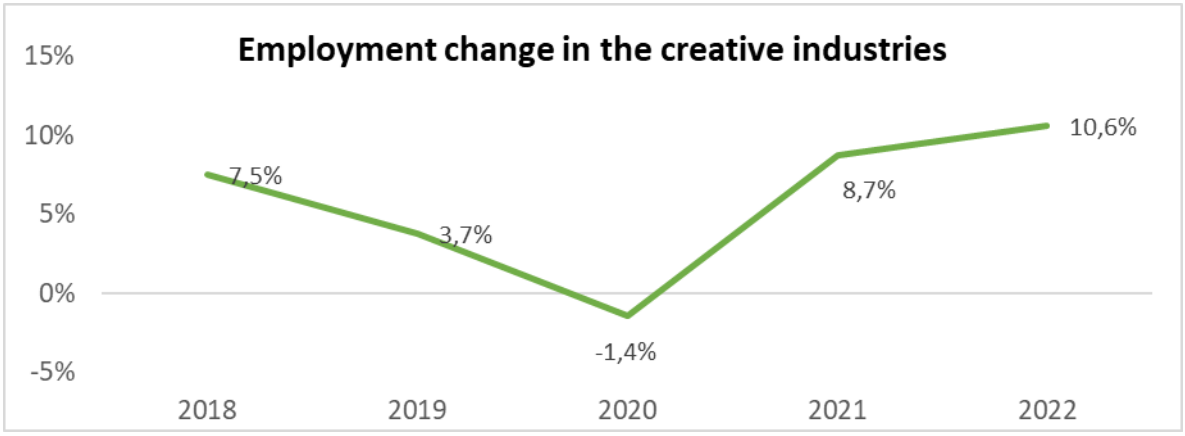


Fig. 1. Change in Employment Rate in the Creative Industries in Bulgaria
Source: NSI, own calculations

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

In general, the number of people working for Creative Industries in Bulgaria decreased most seriously in 2020 as a result of the first lockdown, as after the first negative wave, the business gradually began to recover its initial positions.

4.2. Average salary in Creative Business for the period 2017-2020

Data on average wage levels by year and by sector of the creative industries are presented in Fig. 2. It is interesting to note here that even in 2018, a decrease, albeit a small one (-1,0%), in the average salary was noticed in the Production and distribution of films and television shows sector. The next year, 2019 was negative for the Computer games publishing, where the level of average sale also decreased (-16,4%). In 2022 there were only 3 sectors within the creative industries, which made negative score on the average sales – sound recording and music publishing was seriously hit (-22,5%), followed by artistic and creative activities (- 3,6%) and Radio and TV activities (-1,1%). At the same time, in 2022, interesting progress was made by Book Publishing sector – the average sale here increased the most from all Creative sectors (17,1%), followed by Advertising (10,7%) and Computer games (10,1%).

In terms of the average salary size, logically, the best-paid workers are in computer programming, where, during the considered period, salary growth is maintained. An interesting trend is observed in the average salary of people working in the publishing of computer games. For the first two years since the beginning of the considered period, this is the second sector of the creative industries, offering the highest salaries in Bulgaria. In 2019, however, it saw a decline in the average salary and subsequently showed inconsistent and fluctuating results. However, recording and music publishing has emerged as the second highest-paying sector for creative industry workers in the last two years. The growth there is remarkable – 35,4% for the 2021 and 48,4% for the 2022.

As can be seen from Fig. 3, there is a slowdown in the growth rate of gross wages in the creative industries, with this slowdown most noticeable in 2019 and mainly in 2020, followed by a smooth and gradual recovery in the growth rate of wages in the creative industries in the country. What is evident here is the negative effect that the pandemic generally has on the remuneration of people in the creative business. At the same time, however, the companies themselves were able to recover relatively quickly from the crisis and reach and even surpass the levels of workers' wages from before the introduction of the measures for social isolation, lockdown, etc.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

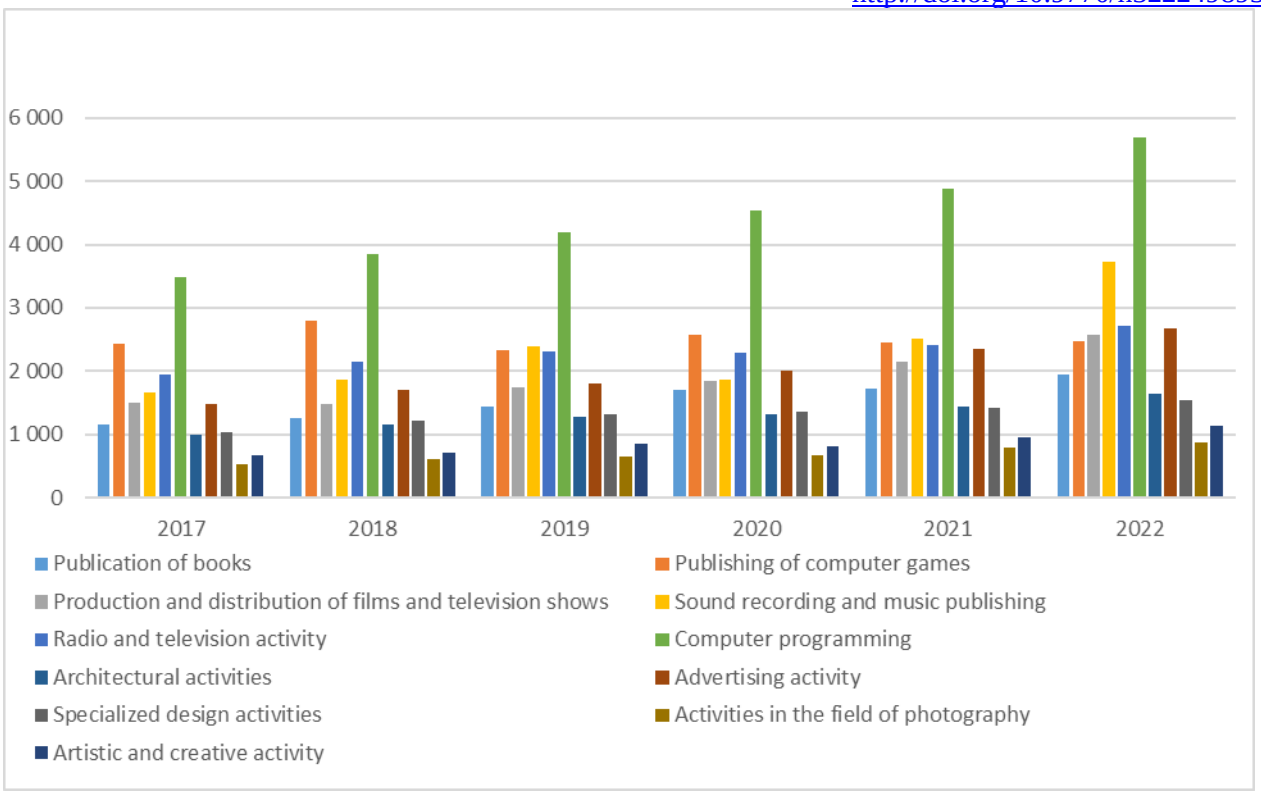


Fig. 2. Average salary in Creative Industries in Bulgaria by sectors (in BGN)
Source: NSI

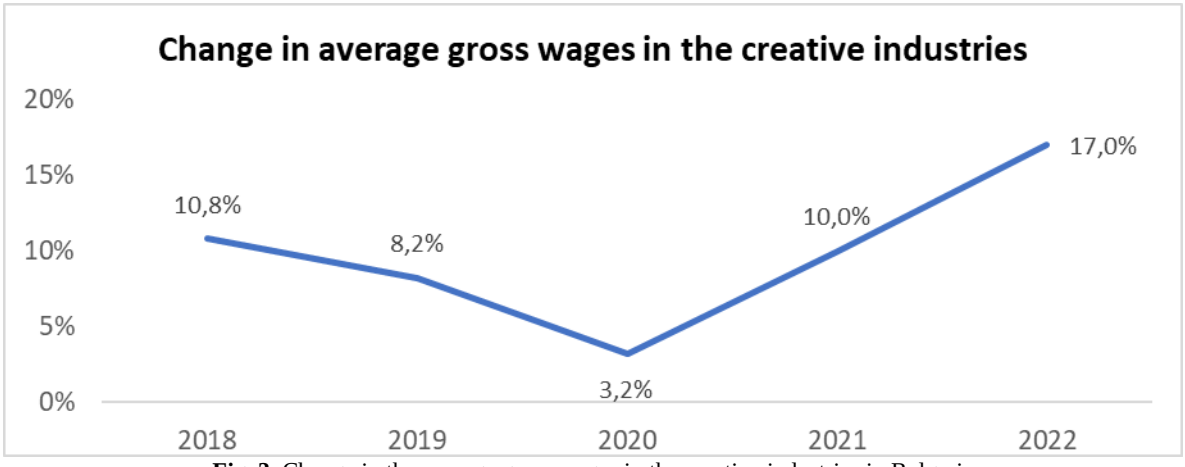


Fig. 3. Change in the average gross wages in the creative industries in Bulgaria
Source: NSI, own calculations

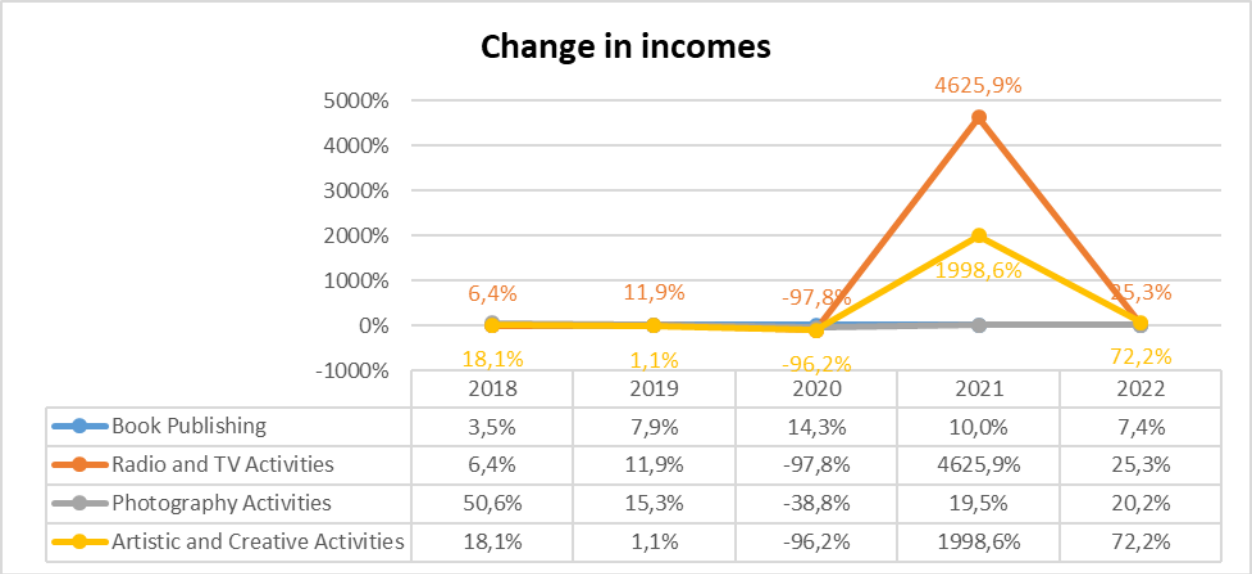
4.3. Change in incomes, expenditures and profit of the companies in Creative Business

For the purpose of the current research and in terms of the most comprehensive analysis of the obtained data, we will explore the incomes, expenditures and profit if the companies in all 11 sectors in the Creative Industries, grouped into four, as follows:

- Group 1 – Book publishing, Radio and TV activities, Photography Activities and Artistic and Creative Activities
- Group 2 – Computer Games Publishing and Computer Programming
- Group 3 - Production and distribution of films and television shows and Sound recording and music publishing
- Group 4 – Architecture, Advertising and Design

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

For Group 1, as can be seen from Figure 4, Photography Activities marked a good rate of income for 2017, but the next years of the period could be considered rather hard for the sector. At the same time, Book Publishing scored progress in income rate for 2020, but a slight decrease for the following 2 years. The most significant change in income rate here was radio and TV activity incomes, where the change in results between 2020 and 2021 is remarkable. Almost the same logic of the income rate was demonstrated by the Artistic and Creative Activities sector – with a huge negative hit in 2020, followed by a drastic change for the next year.



	2018	2019	2020	2021	2022
Book Publishing	3,5%	7,9%	14,3%	10,0%	7,4%
Radio and TV Activities	6,4%	11,9%	-97,8%	4625,9%	25,3%
Photography Activities	50,6%	15,3%	-38,8%	19,5%	20,2%
Artistic and Creative Activities	18,1%	1,1%	-96,2%	1998,6%	72,2%

Fig. 4. Change in incomes in selected sectors of the Creative Industries
Source: NSI, own calculations

The trend forming the change in expenditures in the Group 1 is also interesting to analyze. Here, the most stable sector is Book Publishing, showing the smooth development during the period (Fig. 5).

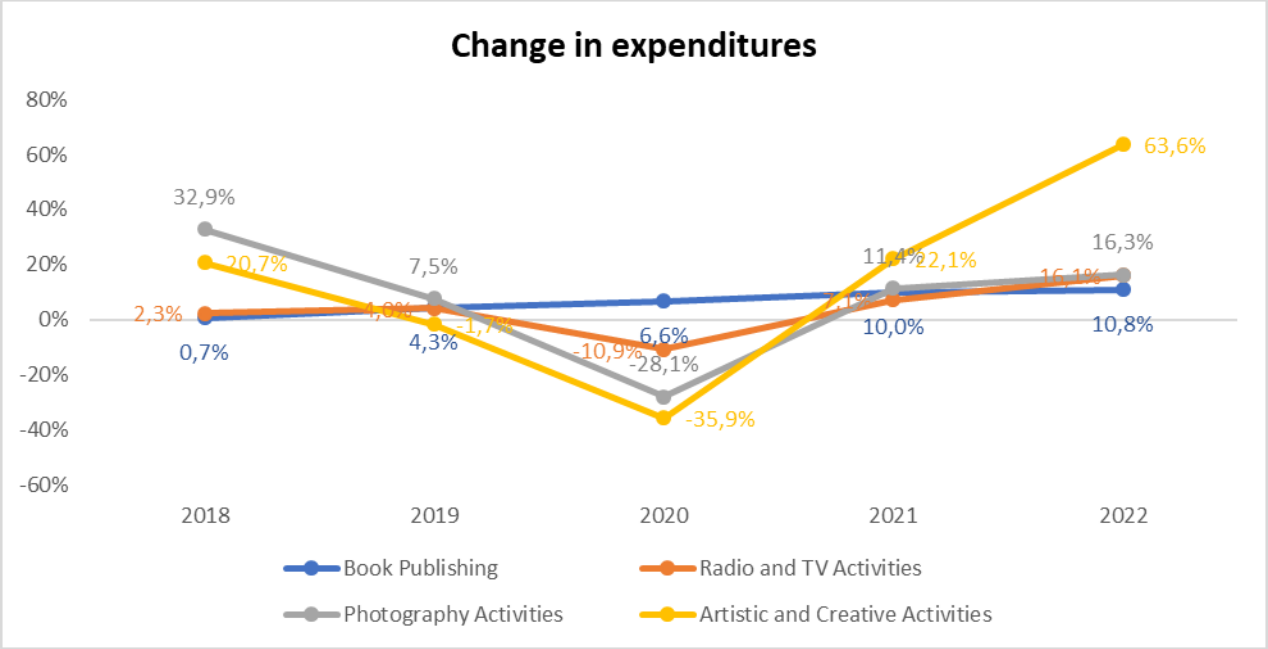


Fig. 5. Change in expenditures in selected sectors of the Creative Industries
Source: NSI, own calculations

At the same time, the other three sectors of this group performed negatively in 2020. The highest rate of negative expenditures is in Artistic and Creative Activities (-35,9 for 2020), followed by Photography activities (-28,1%) and Radio and TV activities (-10,9%). Based on these results, we could claim that Book Publishing

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

was the most stable sector from Group 1 in terms of change in expenditures. Conversely, the picture will be fully clear after the results from the profit data achieved by different sectors in this group are revealed (Fig. 6).

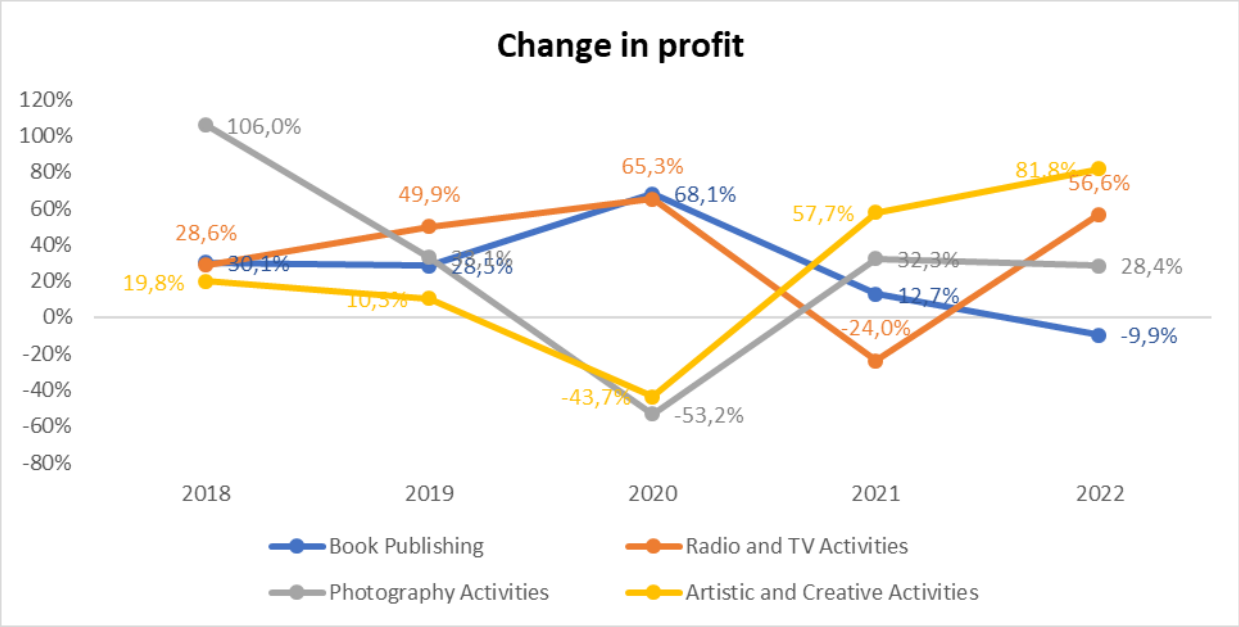


Fig. 6. Change in profit in selected sectors of the Creative Industries
Source: NSI, own calculations

Obviously, from the figure above, companies in the photographic activities sector have seen the greatest fluctuation in terms of profit. For the period under review, they do not show even minimal sustainability of some of their results. This means that the sector has certainly been hit hard by the pandemic and is definitely not yet able to recover - i.e., the profit levels of the pre-pandemic years have not yet been reached. At the same time, Book Publishing, which sector demonstrated a relatively good rate of profit growth for the first three years of the period, was seriously hit for the last two years. In fact, this sector remains the only one from Group 1, which has a negative rate for 2022. Here Artistic and Creative Activities made the most impressive progress – from negative rate for 2020 (- 43,7%) to very positive rate of profit for 2022 (81,8%). Interesting finding is the negative rate in profit change for the Radio and TV sector for 2021, which fact could be explained with the logic of project principle work in the sector and contracts in force. Therefore, the negative results in 2021 could be a reflection of the lack of new contracts signed during the lockdown period.

For the companies in Group 2, operating in sectors Computer Games Publishing and Computer programming, the picture could be considered as rather different.

The Computer Game Publishing sector marked growth in income rate for the first two years of the period and a significant decline for 2020. For the remaining two years of the period, the data for this specific sector remains confidential. At the same time, the Computer programming sector made a relatively slight decline in income rate for the first three years but demonstrated stable development for the last two years of the period (Fig. 7).

In terms of rate of expenditures (Fig. 8), Computer Programming sector demonstrates its stability. At the same time, Computer Game Publishing has shown fluctuation and growth in its expenditures for the last 2 years. This growth in expenditures, in fact, is easily explained when we have the change in profit of these two sectors (Fig. 9).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

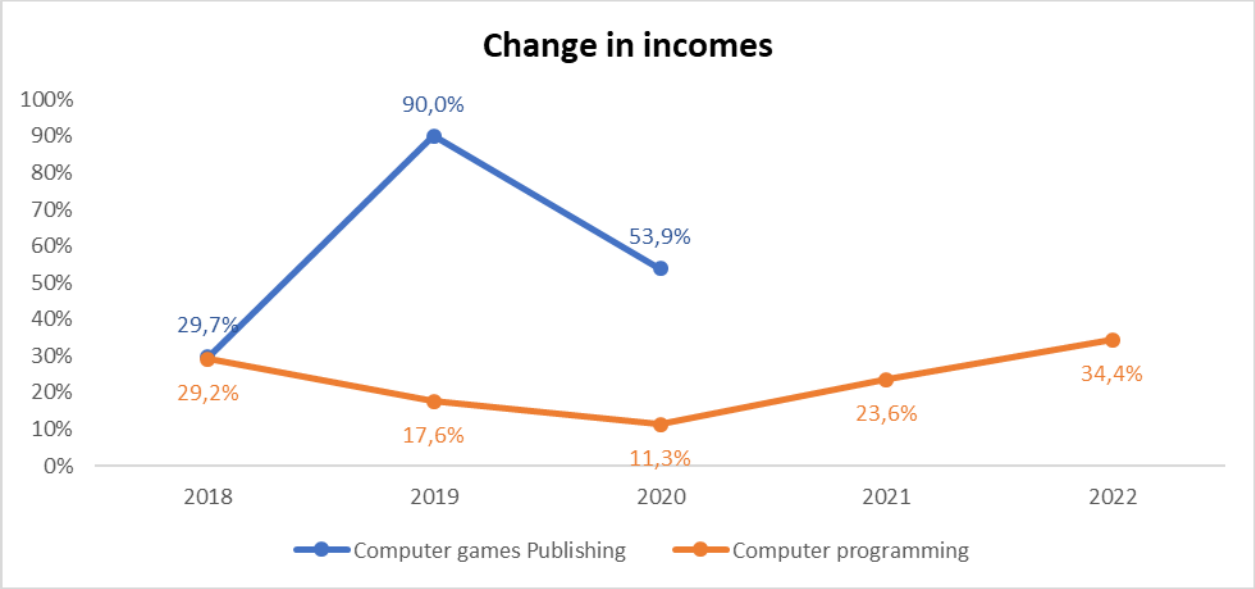


Fig. 7. Change in incomes in selected sectors of the Creative Industries
Source: NSI, own calculations

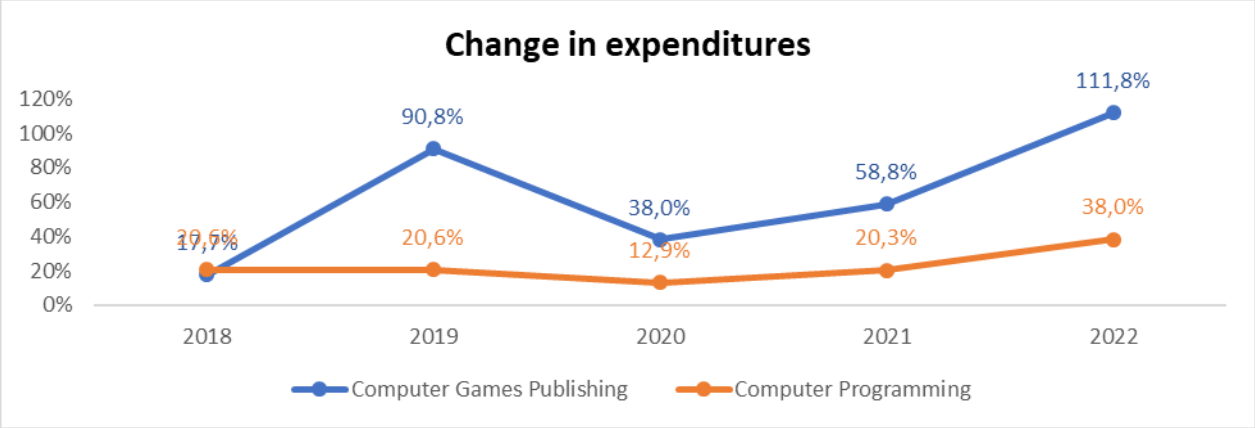


Fig. 8. Change in expenditures in selected sectors of the Creative Industries
Source: NSI, own calculations

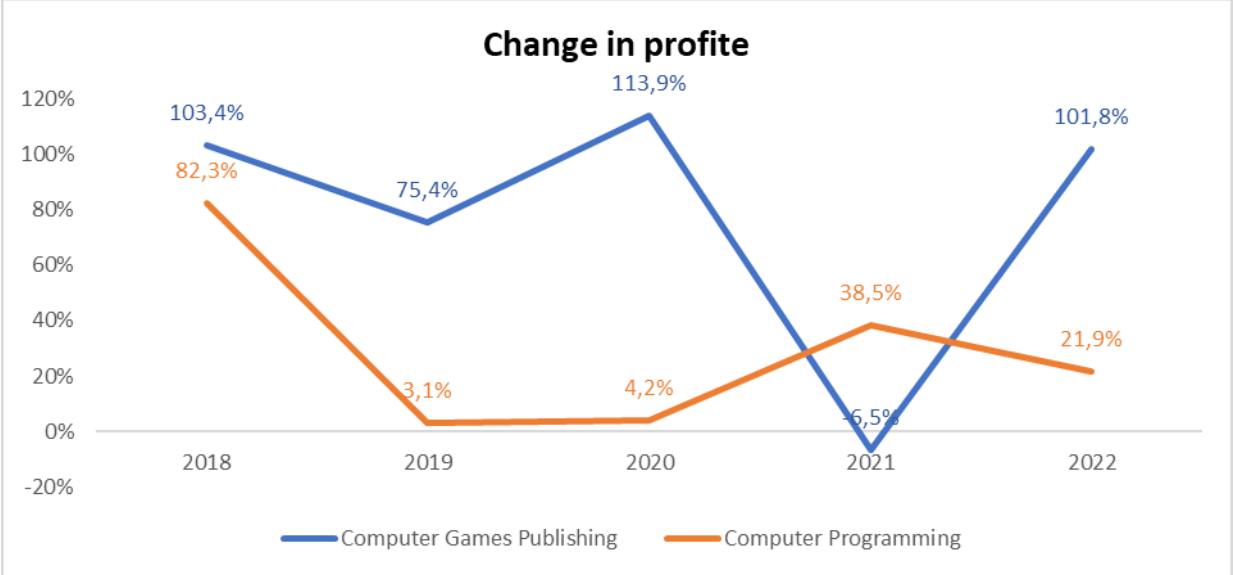


Fig. 9. Change in profit in selected sectors of the Creative Industries
Source: NSI, own calculations

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

The most serious year for Computer Game publishing was 2021 when the sector scored a negative rate of profit change. However, the sector managed to cope rapidly, considering the results of the following 2022 year, with a 101,8 change in the profit rate. This negative result in 2021 could also be explained by the lack of sufficient contracts and new clients in the previous year, marked by the lockdown and serious precaution measures. At the same time, the results obtained by the Computer Programming sector in Bulgaria show a decrease in profit rate for 2019, followed by a slight 2-year growth. Interesting here is the decrease in the profit rate for 2022, which could not be considered as a direct reflection of the COVID-19 crisis, rather than other global trends in this specific sector – for instance, the rapid development of AI and others, structural changes in programming teams, etc. This sector in Bulgaria is heterogeneous; companies have different profiles and main financial sources (for instance, branches of international companies in Bulgaria), reflecting the overall company's financial performance and sustainability.

Group 3 is formed by companies in the Production and Distribution of films and Sound recording and Music Publishing sectors. According to data for the incomes, both sectors have roughly the same trajectory of change in incomes (Fig. 10).

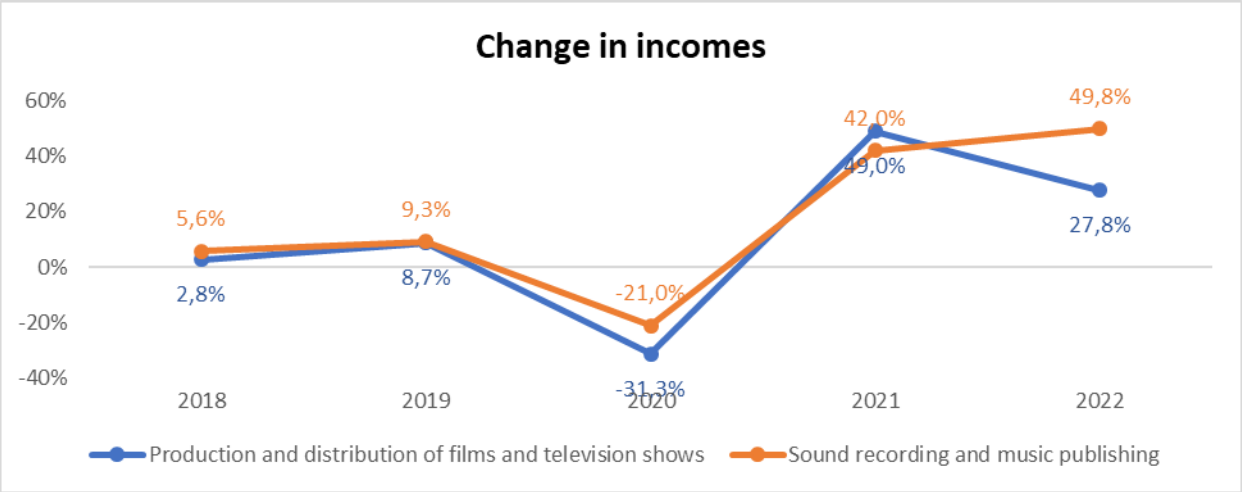


Fig. 10. Change in incomes in selected sectors of the Creative Industries
Source: NSI, own calculations

Both sectors were seriously hit by the pandemic in 2020 but achieved a positive income rate in the next 2021 year. At the same time, Sound recording and Music Publishing also have a positive income rate for the next 2022 year, while the Production and distribution of films and TV Shows mark a decline (Fig. 11).

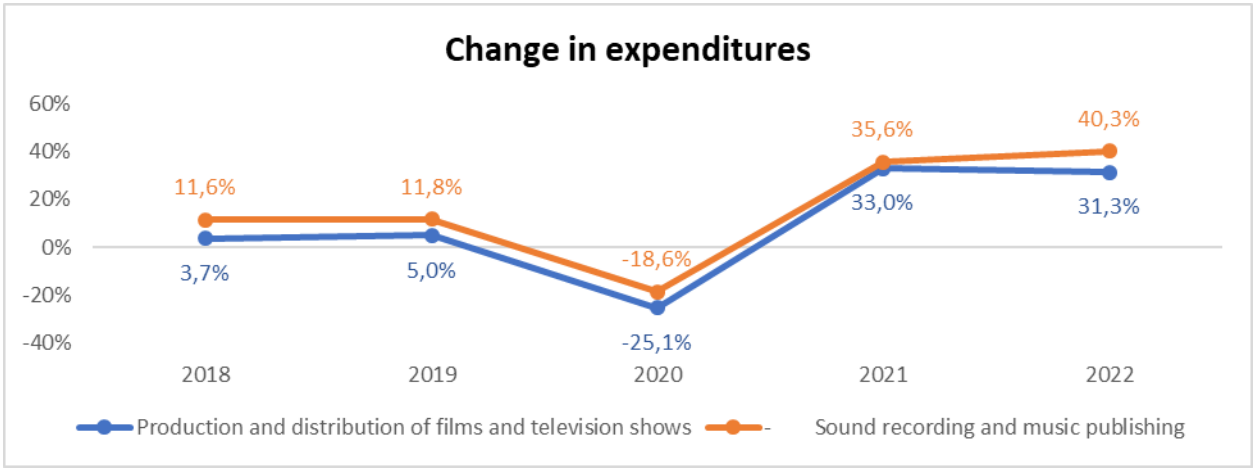


Fig. 11. Change in expenditures in selected sectors of the Creative Industries
Source: NSI, own calculations

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

The same logic of development of the two sectors is seen in terms of the changes in the period's expenditures. The most dramatic year when the results of both sectors are negative is 2022, which is confirmed again by the results achieved in this group for the profit change rate (Fig. 12).

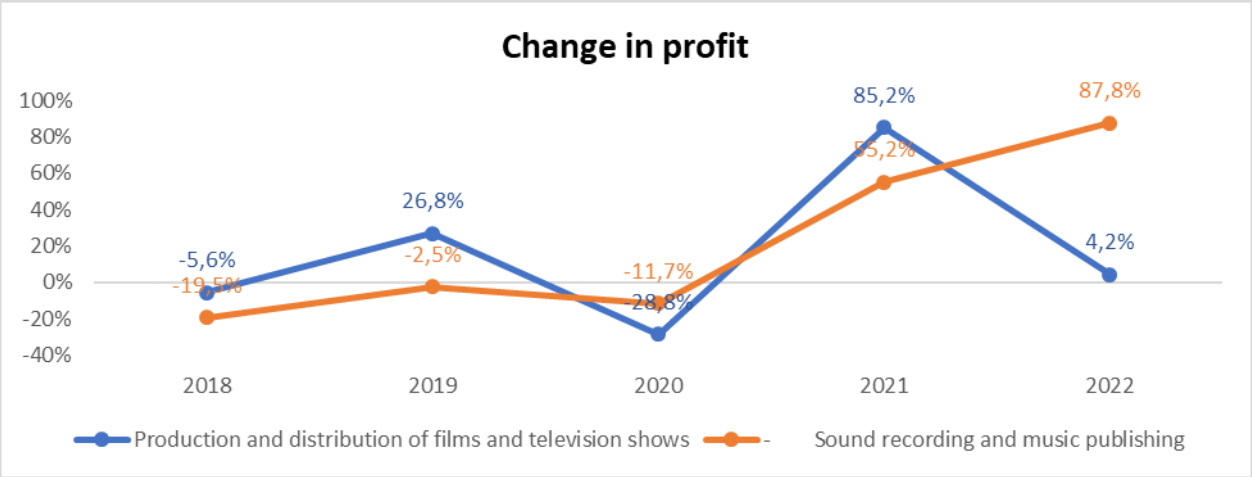


Fig. 12. Change in profit in selected sectors of the Creative Industries
Source: NSI, own calculations

As shown in Fig. 12, the production and distribution of films and television shows experienced a more remarkable turbulent change in profit during the period compared to the Sound recording and Music Publishing sector. Again, it is obvious that the seriousness of the crisis hit both sectors in 2020, which is more serious for the Films and TV shows, but right after the crisis, this sector marked great positive change, even bigger than the Sound recording. In 2022, Sound and music recording continues its positive change in profit rate, while the Films and TV shows sector demonstrates a decrease from the change level. This fact could be considered as a sign that this sector has difficulties overcoming the different effects of a pandemic.

The last group, 4, from the creative industries, is formed by the sectors Architecture, Advertising and Design, which demonstrate different variations in their companies` financial performance during the years of the considered period.

The three sectors achieve interesting results in terms of incomes, especially compared to each other. For instance, the most favourable change in incomes as the starting point of the period belongs to Advertising (5,9%), but at the same time, this sector is the only one of the three, which marks a negative change in incomes for the next two years. In 2021, Advertising managed to achieve a 24,4% change in incomes, which led the sector again to the premier position. The last year of the period Advertising achieved slight negative change in incomes, which fact gives the second place for the sector for 2022.

The second starting position is for Architecture, which also begins the period with a positive change in incomes (1,5%), keeping this positive change and second position for the next year. In 2020, the sector, even with the negative change in incomes, demonstrated a relatively good level of income, which transformed the sector into the leading one and relatively stable in front of the crisis. After 2020, Architecture achieved a good level of positive change in incomes. Still, it was overtaken by the rate of development of the companies in the other two sectors, which were hit much harder by the crisis. At the same time, the fluctuations in the Design Sector are very strong, especially in comparison with the two other sectors. Design started in third place in 2018, and achieved the biggest change for the next year, which led the sector to first place in 2019, then in 2020, it was seriously hit by the crisis but demonstrated successful efforts for recovery and development with the most serious positive change in incomes and logically first place for 2022 (Fig. 13).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

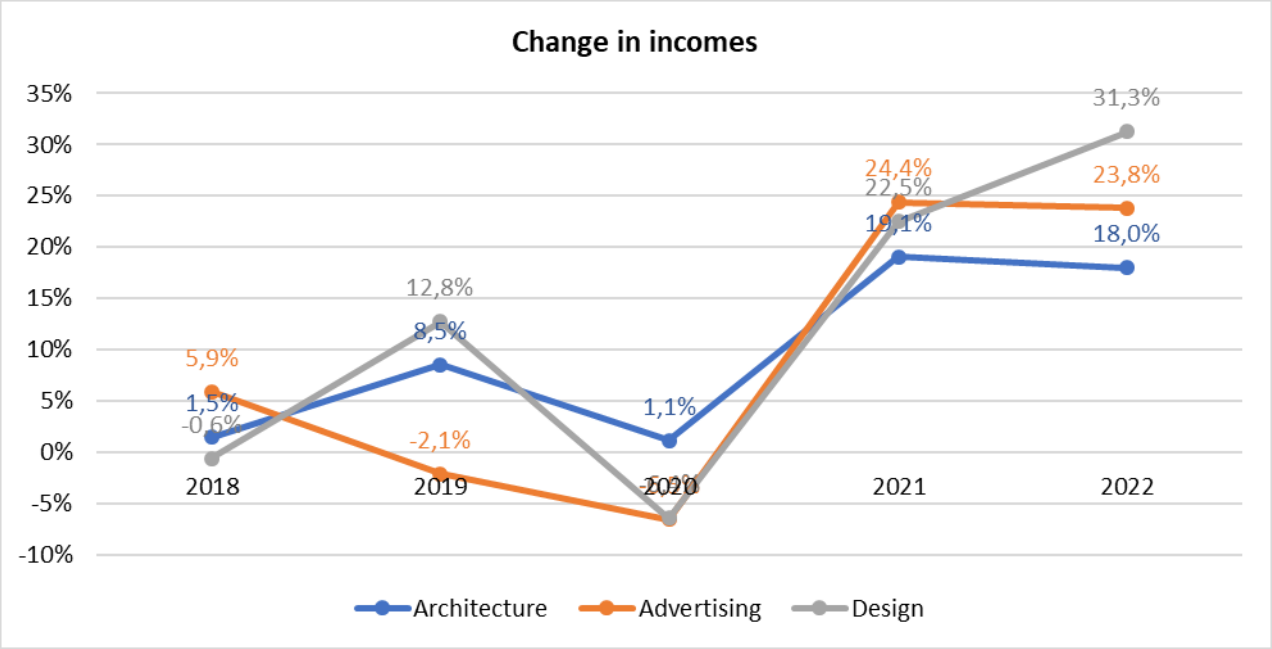


Fig. 13. Change in incomes in selected sectors of the Creative Industries
Source: NSI, own calculations

The change in expenditures (Fig. 14) confirms the already made conclusion that the Advertising sector had the most severe and dramatic change during the period, while the two other sectors had relatively common trends.

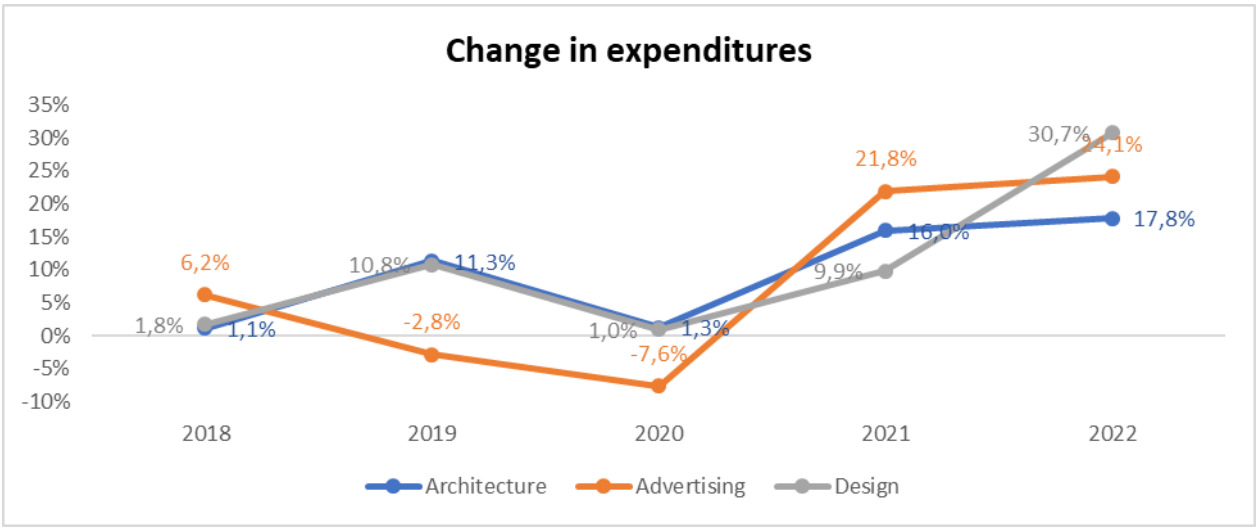


Fig. 14. Change in expenditures in selected sectors of the Creative Industries
Source: NSI, own calculations

In terms of profit during the period, the Design sector experienced a serious change, which made the sector the most unstable and sensitive to the COVID-19 crisis. This sector started with an adverse change in profit (which poses the sector in third place), followed by the biggest change for the next year (first place), and again the most significant change in profit, but this time negative for 2020 (again third place) and the last two years with positive change in profit with a slight decline for the last one, but in the first place for incomes among these three sectors. At the same time, Advertising and Architecture had almost the same logic of profit change during the period. Still, Advertising demonstrated more sensitivity to the crisis change, while Architecture achieved relatively stable results, especially compared to the other sectors (Fig. 15).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

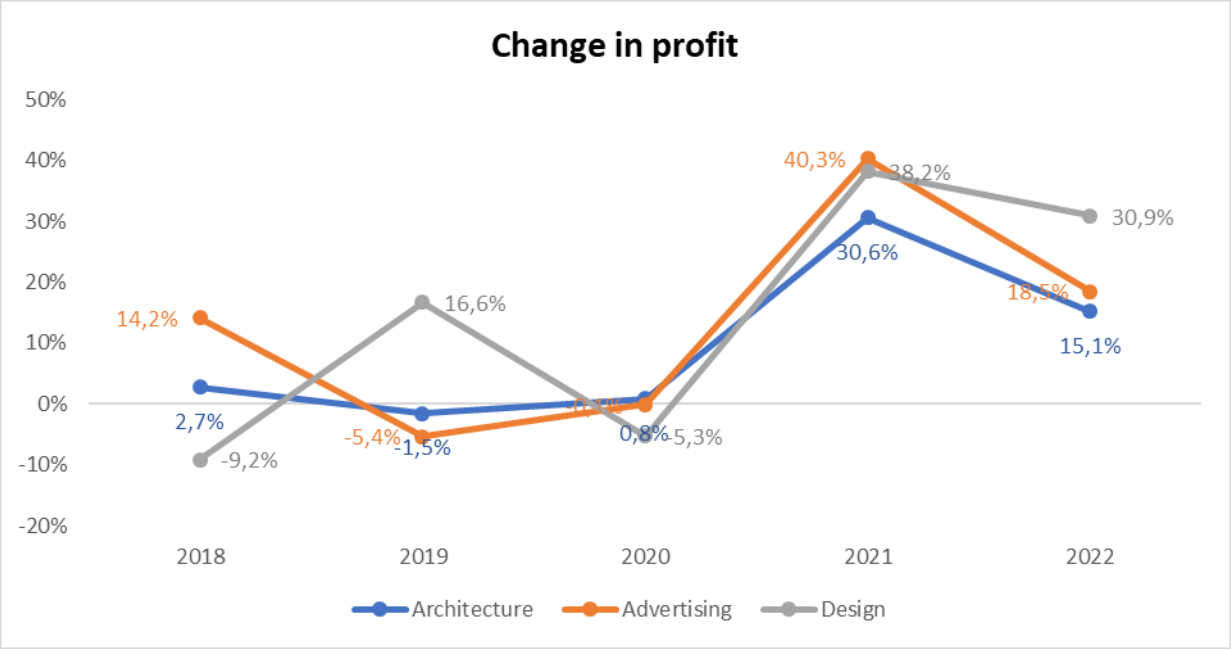


Fig. 15. Change in profit in selected sectors of the Creative Industries
Source: NSI, own calculations

In summary, for all Bulgarian companies working in Creative Business, the COVID-19 pandemic was a serious challenge that changed the overall logic of the companies` development. It is evident from both figures (Fig. 16 and Fig. 17), containing cumulative data for changes in incomes and changes in expenditures that 2020 was very difficult for all the companies in the Creative Business.

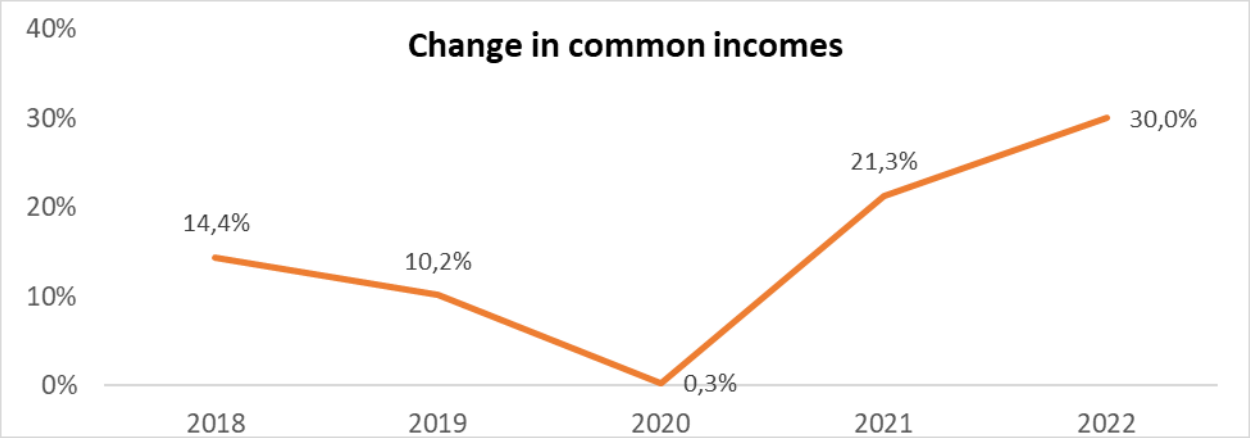


Fig. 16. Change in common incomes for all sectors within the Creative Industries
Source: NSI, own calculations

When we explore the ability of Creative Businesses in Bulgaria to resist and recover from the consequences of the crisis, one important aspect also has to be considered – the concrete policy and measures taken by the different governmental authorities to support businesses in these difficult and unprecedented times. The following figure (Fig. 18) reveals this part of the public support. Still, here, we also have to notice that part of the information provided by NSI is defined as "confidential" and, therefore, is missing. Nevertheless, several trends could be drawn based on the available data.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

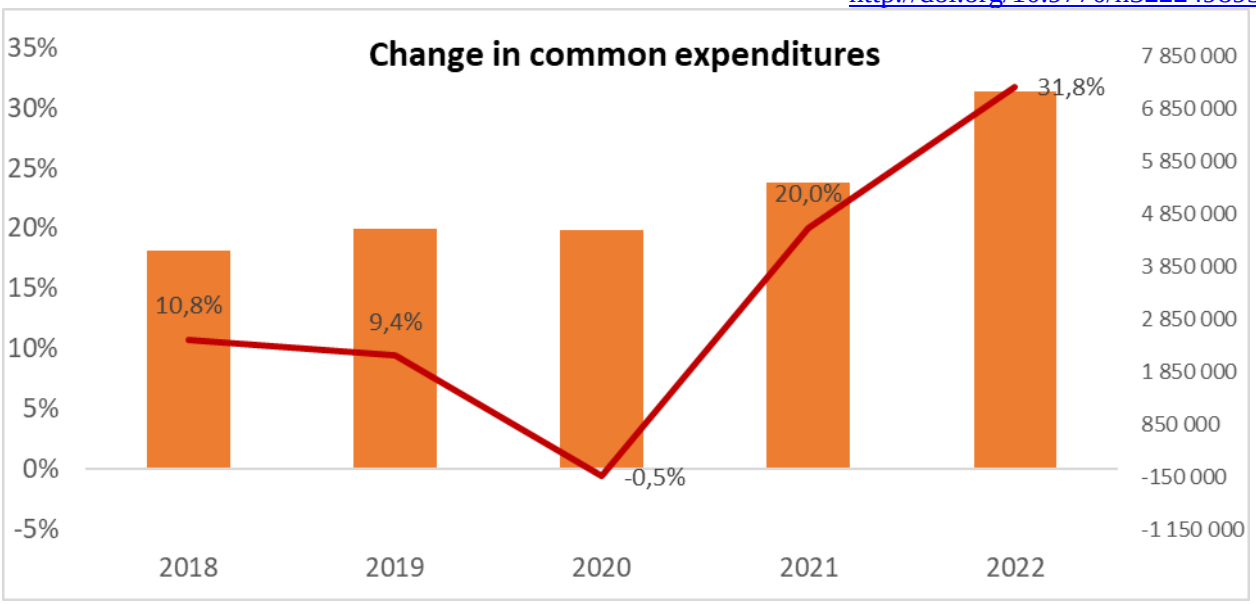
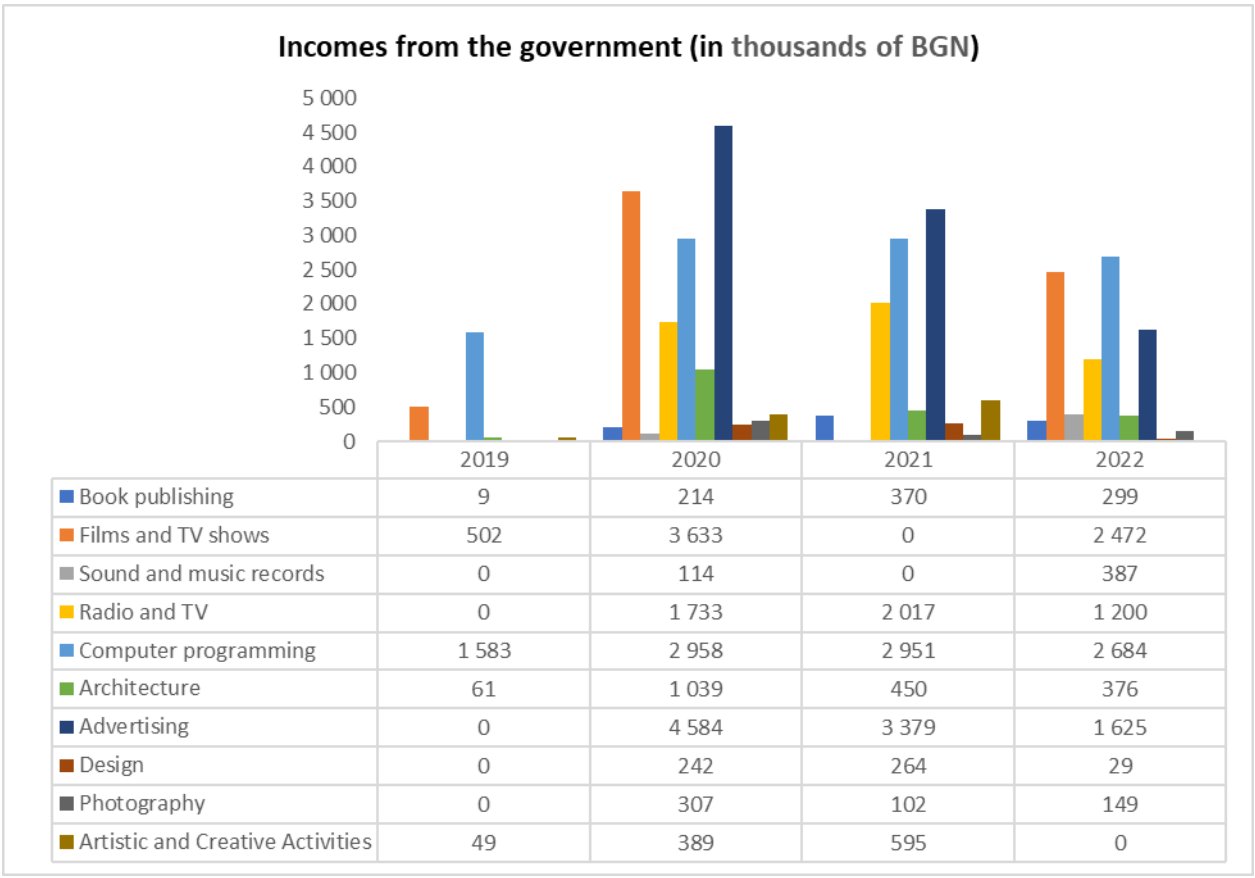


Fig. 17. Change in common expenditure for all sectors within the Creative Industries
Source: NSI, own calculations



	2019	2020	2021	2022
Book publishing	9	214	370	299
Films and TV shows	502	3 633	0	2 472
Sound and music records	0	114	0	387
Radio and TV	0	1 733	2 017	1 200
Computer programming	1 583	2 958	2 951	2 684
Architecture	61	1 039	450	376
Advertising	0	4 584	3 379	1 625
Design	0	242	264	29
Photography	0	307	102	149
Artistic and Creative Activities	49	389	595	0

Fig. 18. Governmental support provided by different sectors within the Creative Industries
Source: NSI

First of all, it is evident that five sectors of the Creative Business received financial governmental support even in 2019, which fact could be explained in two separate lines of consideration: first line – defining these sectors as priority sectors for the national economy (for instance Computer programming, Films and TV Shows, Artistic and Creative Activities) and second line – that these sectors are traditional ones with a close and stable relationship with authorities (Architecture and Book publishing).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

Second, the most significant support in terms of public funding was received by creative business companies in 2020. The most generously supported sectors in 2020 within the Creative Industries are Advertising, Films, TV shows, and Computer Programming. During the next two years of the period (2021 and 2022), the intensity of public support for companies will gradually decrease, assuming that along with the removal of social isolation measures, companies will be able to create their forces for further development.

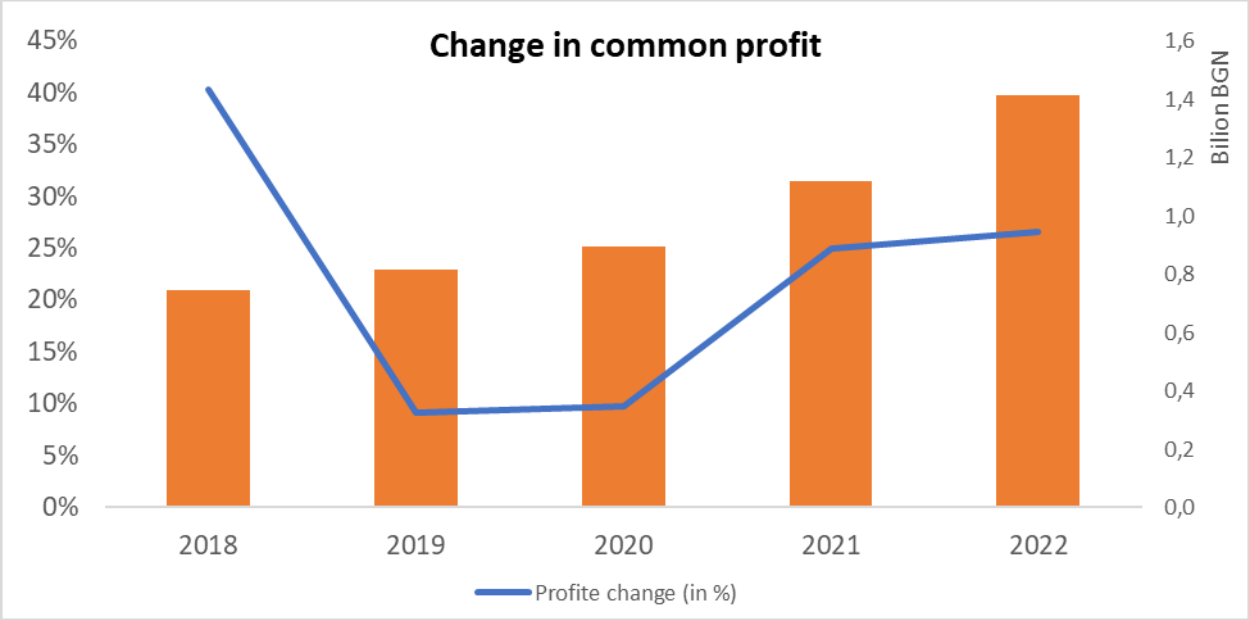


Fig. 19. Change in common profit for all sectors within the Creative Industries
Source: NSI, own calculations

As a result of all precaution measures, lockdowns and, at the same time – different initiatives and measures for securing business organizations at the national level, it could be concluded that the Creative Business companies in Bulgaria demonstrated a relatively good level of sustainability and adaptability during and right after the COVID-19 crisis. The rates in profit change (Fig. 19) confirm the profound negative impact of the pandemic (results in 2019 and 2020), but at the same time – reveal a good level of resilience and recovery of the companies (results in 2021 and 2022).

5. Conclusion

Creative industries in Bulgaria have been profoundly impacted by the COVID-19 pandemic, facing unprecedented hurdles and disruptions, confirmed by their overall performance and financial results in official data. The sudden cessation of economic activities and restrictions on public gatherings and mobility severely affected sectors such as film, music, performing arts, and visual arts. Nevertheless, amidst these obstacles, the creative sectors have showcased resilience and adaptability, utilizing digital platforms and innovative methods to maintain audience engagement and generate income.

As Bulgaria progresses towards recovery, it's clear that a comprehensive approach is necessary to revive the creative industries. This entails targeted financial support, policy measures to encourage digitalization and innovation, and initiatives to foster cultural exchange and local and international collaboration. Additionally, there's a pressing need for improved infrastructure and resources to facilitate the transition to hybrid production and distribution models.

Although the recovery path may be challenging, it also presents an opportunity for the creative industries to rethink their roles and significance in society. By harnessing creativity, innovation, and collaboration, Bulgaria's creative sectors can emerge stronger and more resilient in a post-pandemic era, contributing to cultural enrichment, economic prosperity, and social cohesion.

In essence, the obstacles posed by COVID-19 have underscored the importance of a dynamic and sustainable creative environment, emphasizing the necessity for coordinated efforts among government, industry, and civil society to ensure the continued vitality and relevance of Bulgaria's creative sectors.

References

Amankwah-Amoah, J., Abdalla, S., Mogaji, E., Elbanna, A., Dwivedi, Y. K. (2024). The impending disruption of creative industries by generative AI: Opportunities, challenges, and research agenda. *International Journal of Information Management*, 102759. https://doi.org/10.1016/j.ijinfomgt.2024.102759

Anjaningrum, W. D., Azizah, N., Suryadi, N. (2024). Spurring SMEs' performance through business intelligence, organizational and network learning, customer value anticipation, and innovation - Empirical evidence of the creative economy sector in East Java, Indonesia. *Heliyon*, 10(7), e27998. https://doi.org/10.1016/j.heliyon.2024.e27998

Arcos-Pumarola, J., Paquin, A. G., Sitges, M. H. (2023). The use of intangible heritage and creative industries as a tourism asset in the UNESCO creative cities network. *Heliyon*, 9(1), e13106. https://doi.org/10.1016/j.heliyon.2023.e13106

Borre, J. R., Romero, G. C., Gutiérrez, J. M., Ramírez, J. (2023). Discussion of the aspects of the cultural and creative industries that impact on sustainable development: a systematic review. *Procedia Computer Science*, 224, 532-537. https://doi.org/10.1016/j.procs.2023.09.077

Culpepper, M. K., Gauntlett, D. (2024). The construction of everyday creative identity. *Journal of Creativity*, 34(2), 100085. https://doi.org/10.1016/j.yjoc.2024.100085

Dimcheva, G, Stoyanov, I. (2023). Challenges to the Application and Decision-Making using Artificial Intelligence (AI): Analysis of the Attitudes of Managers in Bulgarian Service Companies, *Proceedings CIEES 2023* - IEEE International Conference on Communications, Information, Electronic and Energy Systems, ISBN 979-835033691-7. https://doi.org/10.1109/CIEES58940.2023.10378811

Duarte, V., Gauntlett, D. (2022). Adapting, surviving, discovering: Creative practitioners in the COVID-19 crisis. *Journal of Creativity*, 32(2), 100027. https://doi.org/10.1016/j.yjoc.2022.100027

Eletxigerra, A., Caldeira, A. M., Kastenholz, E. (2023). A cost-benefit approach of consumers' intentions to participate in highly co-creative tourism activities during and after COVID-19: Evidence from wine tourism, *Journal of Hospitality and Tourism Management*, 56, 506-518. https://doi.org/10.1016/j.jhtm.2023.08.010

Fahmi, F. Z., Krismiyaningsih, E., Sagala, S. A. H., Rustiadi, S. (2023). Creative industries and disaster resilience: A focus on arts- and culture-based industries in Indonesia. *International Journal of Disaster Risk Reduction*, 99, 104136. https://doi.org/10.1016/j.ijdrr.2023.104136

Gong, H., Yu, Z., Hassink, R. (2023). Differentiated knowledge bases and catch-up in creative industries – A case of the online game industry in China. *Geoforum*, 141, 103730. https://doi.org/10.1016/j.geoforum.2023.103730

Hattori, E. A., Yamakawa, M., Miwa, K. (2024). Human bias in evaluating AI product creativity. *Journal of Creativity*, 34(2), 100087. https://doi.org/10.1016/j.yjoc.2024.100087

Ivcevic, Z., Grandinetti, M. (2024). Artificial intelligence as a tool for creativity. *Journal of Creativity*, 34(20, 100079. https://doi.org/10.1016/j.yjoc.2024.100079

Javaid, M., Haleem, A., Singh, R. P., Sinha, A. K. (2024). Digital economy to improve the culture of industry 4.0: A study on features, implementation and challenges. *Green Technologies and Sustainability*, 2(2), 100083. https://doi.org/10.1016/j.grets.2024.100083

Katz, J. H., Mann, T. C., Shen, X., Goncalo, J.A., Ferguson, M. J. (2022). Implicit impressions of creative people: Creativity evaluation in a stigmatized domain. *Organizational Behavior and Human Decision Processes*, 169, 104116. https://doi.org/10.1016/j.obhdp.2021.104116

Khlystova, O., Kalyuzhnova, Y., Belitski, M. (2022). The impact of the COVID-19 pandemic on the creative industries: A literature review and future research agenda. *Journal of Business Research*, 139, 1192-1210. https://doi.org/10.1016/j.jbusres.2021.09.062

Kim, M. (2023). Empowering local arts organizations and governance: The case of Gordon Square Arts District in Cleveland, Ohio, City. *Culture and Society*, 33, 100515. https://doi.org/10.1016/j.ccs.2023.100515

Langevang, T., Steedman, R., Alacovska, A., Resario, R., Kilu, R. H., Sanda, M.-A. (2022). 'The show must go on!': Hustling through the compounded precarity of COVID-19 in the creative industries. *Geoforum*, 136, 142-152. https://doi.org/10.1016/j.geoforum.2022.09.015

Malik, N., Wei, Y. "Max", Appel, G., Luo, L. (2023). Blockchain technology for creative industries: Current state and research opportunities. *International Journal of Research in Marketing*, 40(1), 38-48. https://doi.org/10.1016/j.ijresmar.2022.07.004

Nagayama, S. (2023). Does working at third places work? Multi-locational work for engagement, creativity, and well-being. *Journal of Creativity*, 33(3), 100070. https://doi.org/10.1016/j.yjoc.2023.100070

O'Toole, K., Horvát, E.-Á. (2024). Extending human creativity with AI. *Journal of Creativity*, 34(2), 100080. https://doi.org/10.1016/j.yjoc.2024.100080

Peñarroya-Farell, M., Miralles, F. (2022). Business Model Adaptation to the COVID-19 Crisis: Strategic Response of the Spanish Cultural and Creative Firms. *Journal of Open Innovation: Technology, Market, and Complexity*, 8(1), 39. https://doi.org/10.3390/joitmc8010039

Rius-Ulldemolins, J., Díaz-Solano, P. (2023). Local political change, the neo-creative city paradigm and the mutations of Valencian cultural branding, City. *Culture and Society*, 34, 100535. https://doi.org/10.1016/j.ccs.2023.100535

Shaughnessy, C., Perkins, R., Spiro, N., Waddell, G., Campbell, A., Williamon, A. (2022). The future of the cultural workforce: Perspectives from early career arts professionals on the challenges and future of the cultural industries in the context of COVID-19. *Social Sciences & Humanities Open*, 6(1), 100296. https://doi.org/10.1016/j.ssaho.2022.100296

Srivastava, C., Murnane, E.L., Billington, S.L., Samuelson, H. W. (2024). Impact of workplace design on perceived work performance and well-being: Home versus office. *Journal of Environmental Psychology*, 95, 102274. https://doi.org/10.1016/j.jenvp.2024.102274.

Tang, C., Xu, J., Mao, S., Naumann, S.E. (2024). The effects of creative personality on scientist creativity. *Thinking Skills and Creativity*, 51, 101465. https://doi.org/10.1016/j.tsc.2024.101465

Tønnessen, Ø., Dhir, A., Flåten, B.-T. (2021). Digital knowledge sharing and creative performance: Work from home during the COVID-19 pandemic. *Technological Forecasting and Social Change*, 170, 120866. https://doi.org/10.1016/j.techfore.2021.120866

Tsao, J.Y. et al. (2024). AI for Technoscientific Discovery: A Human-Inspired Architecture. *Journal of Creativity*, 34(2), 100077. https://doi.org/10.1016/j.yjoc.2024.100077

Turchet, L., Ngo, C. N. (2022). Blockchain-based Internet of Musical Things. *Blockchain: Research and Applications*, 3(3), 100083. https://doi.org/10.1016/j.bcra.2022.100083

Viganò, F., England, L., Comunian, R. (2023). Connecting craft, design and the wood industry in South Tyrol: From clusters to creative ecosystem, *Journal of Rural Studies*, 104, 103149. https://doi.org/10.1016/j.jrurstud.2023.103149

Zhang, H., Wang, R., Cai, K. (2024). Research on the application and examination of electronic evidence preserved on the blockchain in Chinese copyright judicial practice. *Computer Law & Security Review*, 52, 105891. https://doi.org/10.1016/j.clsr.2023.105891

Funding: This article was funded by the University of National and World Economy, Sofia, Bulgaria

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/h3222498933

Author Contributions: The authors contribution is 80:20. All authors have read and agreed to the published version of the manuscript.

Stanimir STAMATEV is an Assistant Professor Ph.D. in the Department of Management, University of National and World Economy, Sofia, Bulgaria. Research interests: Creative Business Management, Financial Management, Leadership, Knowledge Management.
ORCID ID: https://orcid.org/0009-0004-6406-0210

Miglena ANGELOVA is an Assoc. Professor Ph.D. in the Department of Management, University of National and World Economy, Sofia, Bulgaria. Research interests: Creative Business Management, Change Management, Strategic Management, IT Management, HR Management
ORCID ID: https://orcid.org/0000-0002-4460-133X

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

Publisher
http://jssidoi.org/esc/home

THE ENTREPRENEURIAL PROCESS OF SCHUMPETERIAN SOCIAL ENTREPRENEURS – A QUALITATIVE STUDY

Jonathan Mirvis

The Hebrew University of Jerusalem, Israel

E-mail: jonathan.mirvis@mail.huji.ac.il

Received 30 August 2024; accepted 19 October 2024; published 30 December 2024

Abstract. This empirical research focuses on social entrepreneurs who challenge the equilibrium by providing new services to beneficiaries in multiple locations. We have termed these entrepreneurs "Schumpeterian social entrepreneurs", echoing Joseph Schumpeter's definition of a commercial entrepreneur. This research aimed to understand the entrepreneurial process followed by Schumpeterian social entrepreneurs, emphasizing their objectives, points of entry into the process, connections to the fields of their endeavors, and strategies deployed to change the equilibrium. Ten Israeli social entrepreneurs were interviewed using the life story method. The key findings were as follows. The research highlighted two types of entrepreneurs according to their objectives and way of entry. These first comprised entrepreneurs who sought to capture social value and were opportunity-focused. In contrast, the second category comprised those who focused on solving social problems having responded to "a call to action". There were many "outsiders" among the entrepreneurs. There is a possible correlation between a personal history of volunteering and a willingness to become a social entrepreneur. There is a predominance of two factors that enhanced the scaling up of the organizations' services: the mobilization of large numbers of committed volunteers and the use of platforms to operate the organization's services.

Keywords: entrepreneurial process; social entrepreneurship; social value; entrepreneurship theories; innovations; opportunities

Reference to this paper should be made as follows: Mirvis, J. 2024. The entrepreneurial process of Schumpeterian social entrepreneurs - a qualitative study. *Entrepreneurship and Sustainability Issues*, 12(2), 148-162. http://doi.org/10.9770/j6547986272

JEL Classifications: L26, L31

1. Introduction

Among social entrepreneurs, it is possible to differentiate between two types. The first type comprises multiple social entrepreneurs who incrementally create social value locally. In contrast, the second type includes a small group of social entrepreneurs whose endeavors challenge the equilibrium and create social value for society. Examples of this second type are Mohammed Unis, who developed the Grameen Bank in Bangladesh; Michael Young, who founded the British Open University; Erzsébet Szekeres, who instituted assisted living support for people with disabilities in Hungary; and Jeroo Billimoria, who established Childline in India.

Within social entrepreneurship theory, there is a significant focus on the first type with little focus on the second. Perhaps a rationale for focusing on the first is its widespread phenomenon. However, given the social impact of the second, the development of theories of this type also merits attention.

In Israel, social entrepreneurs of this second type have initiated first aid medical treatment aided by paramedics who can arrive via motorcycles that carry medical equipment, free assistance for drivers who experience breakdowns on the road, free budget and financial tutoring for households who struggle to live within their means and drug addiction rehabilitation for teens.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

This research focuses on this second type of social entrepreneur to understand the entrepreneurial processes these entrepreneurs follow in establishing their entrepreneurial endeavours. The study emphasizes their initial objectives, points of entry into the process, connections to the fields of their endeavors, and the strategies deployed in their quest to create large-scale value. Ten Israeli social entrepreneurs who have impacted society were selected for this qualitative research, including those who initiated the endeavors above. They were interviewed using the life story research method.

This research is novel in its focus on social entrepreneurs who challenge the equilibrium and impact society at large. The findings provide insights for theory development and social entrepreneurship education in this area.

2. Literature Review

Entrepreneurship

Entrepreneurship" is a commercial concept. According to Kao (1993, pp. 69-70), entrepreneurship "is a process of making changes; doing something different, thus creating wealth for the individual and adding value to society". The concept was introduced by 17th-century French economist Richard Cantillon (Van Praag, 1999), and its source is the French verb, "entreprendre" (Sobel, 2015), meaning "to undertake." (Dees, 2001).

There are multiple approaches related to the process of making changes.

Say argued that entrepreneurs create value by shifting economic resources from an area of lower productivity to an area of higher productivity (Dees, 2001). Knight stressed that entrepreneurs can make sound financial decisions and guide the firm amid uncertainty (Van Praag, 1999).

Joseph Schumpeter and Israel Kirzner articulated two dominant and contrasting approaches. Schumpeter maintains that the entrepreneur challenges the current status quo, which he calls the "circular flow" (Schumpeter, 2000, p. 52). The entrepreneur innovates, making new combinations. He is actively involved in creative destruction, destroying and supplanting the old equilibrium with the new (Van Praag, 1999). Schumpeter distinguishes between five types of innovation: new production processes, new products, new materials or resources, new markets, as well as new forms of organizations (Ziemnowicz, 1942, p. 1172)

Kirzner maintains that an entrepreneur displays entrepreneurial alertness and plays a central role in the "equilibrating process" of stabilizing markets (Kirzner, 1997). Entrepreneurial alertness comprises the ability to discover and identify profitable opportunities, particularly in buying and selling transactions; as such, it is central to entrepreneurship. In an arbitrage transaction, an alert buyer entrepreneur discovers opportunities to purchase goods or services at below-market prices. In contrast, an alert seller identifies buyers willing to pay above-market prices.

Comparing the Two Types of Entrepreneur

Schumpeter's entrepreneur is a bold leader, unlike Kirzner, whose entrepreneur could be anyone seeking to profit from a commercial exchange. As such, Kirzner's definition is far more inclusive. Citing his mentor Ludwig von Mises, Kirzner claimed that "in any real and living economy, every actor is always an entrepreneur and speculator." (Kirzner, 1997, p. 16). Schumpeter's entrepreneurs create opportunities through innovation (Estrin et al., 2020; Ebner, 2024).

Kirzner's entrepreneurs discover opportunities through entrepreneurial alertness. Schumpeter's entrepreneur destroys the old equilibrium and creates a new one, while Kirzner's entrepreneur is a catalyst for maintaining the current equilibrium.

Social entrepreneurship

Social entrepreneurship is the application of entrepreneurship to enhance social value (Mair & Marti, 2006). The practice of social entrepreneurship has been in practice for centuries, with the founding of the first public library by Benjamin Franklin in Philadelphia in 1731 (Payne & Newman, 2005) and Florence Nightingale's

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

establishment of the first Nursing School in London in 1860 (Bornstein, 2004) being primary examples; the theoretical field has commenced far more recently. Joseph Banks coined the term "social entrepreneurship" in 1972 (Nicholls, 2006), and Waddock and Post (1991) analyzed and applied the concept nearly 20 years later. The first graduate course in this area was offered by Dees in 1995 at Harvard Business School (Worsham, 2012)

From its earliest days, multiple definitions of social entrepreneurship have been offered (Dacin et al., 2010), but a clear consensus has yet to be reached regarding its meaning (Saebi et al., 2018).

Among the different definitions, two issues of significance for this research are as follows:
1. Parameters of the field;
2. What constitutes an entrepreneurial activity?

Two schools of thought define the field's parameters. The first is the "social enterprise" (Dees & Anderson, 2006) or "earned income" (Tracey & Phillips, 2007) school. From this perspective, social entrepreneurship is a subcategory of commercial entrepreneurship (Mirvis, 2022), to capture social and financial value. This "double bottom line" approach focuses on establishing commercial enterprises that aspire to be catalysts for social change without relying on philanthropic or government support. Theoreticians who adopt this perspective include Boschee and McClurg (2003), Cho (2006), Harding (2004), and Robinson (2006).

The second is the "social innovation school", focusing on social innovation and social impact regardless of income sources. Dees and Anderson (2006) explain this perspective: "From this perspective, we propose that "social entrepreneurship is not about generating income, or even about incremental innovations in the social sector. It is about innovations that can potentially have a major societal impact by, for instance, addressing the root causes of a social problem, reducing particular social needs, and preventing undesirable outcomes" (Dees and Anderson, 2006, p. 46). This perspective views social entrepreneurship as a parallel type of entrepreneurship (Mirvis, 2022), marking the use of entrepreneurial strategies to solve social problems regardless of income sources. Therefore, it has been termed a "cousin" of commercial entrepreneurship (Martin & Osberg, 2007). This perspective was adopted by Austin et al. (2006), Kramer (2005), and Light (2006).

Kirzner influences some theoreticians and views opportunity recognition and exploitation as central (Thompson et al., 2000; Seelos & Mair, 2005; Zahra et al., 2009). Others, influenced by Schumpeter, stressed the importance of innovation (Perrini & Vurro, 2006).

Schumpeterian Social Entrepreneurship

The Schumpeterian approach to social entrepreneurship highlights two essential characteristics: the social entrepreneur is innovative and challenges the equilibrium. The first is reflected in the definition proposed by Nandan et al. (2015, p. 39), echoing Dees and Anderson (2006): "Social entrepreneurship is the establishment of initiatives to implement social innovations. Social entrepreneurs use innovation to create social value and change through a new venture (in any organizational form) in the public, private, citizen, or nonprofit sector". The second is reflected in Martin and Osberg's (2007) opinion that social entrepreneurship has the following three components: (1) identify a stable but inherently unjust equilibrium that causes the exclusion, marginalization, or suf-fering of a segment of humanity that lacks the financial means or political clout to achieve any transformative benefit on its own; (2) identify an opportunity in this unjust equilibrium, devel-oping a social value proposition, and bringing to bear inspiration, creativity, direct action, courage, and fortitude, thereby challenging the stable state's hegemony and (3) set a new, stable equilibrium that releases trapped potential or alleviates the suf-fering of the targeted group, and through imitation and the creation of a stable ecosystem around the new equilibrium, ensuring a better future for the tar-geted group and even society at large (Martin and Osberg, 2007, p. 35). From the perspective of Martin and Osberg (2007), social entrepreneurs are thus involved in a three-stage process: they identify an unsatisfactory equilibrium, challenge the current status quo through inspiration, creativity, direct action, courage, and fortitude, and forge a new equilibrium ensuring a better future for the targeted group and society at large. Martin and Osberg (2007, p. 36) exclude those establishing small organizations serving a local population. They call these individuals "service providers" because these organizations are not replicated, and their influence is limited to the local population; they do not

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

challenge the equilibrium. From this perspective, social entrepreneurship is practiced by a small band of courageous leaders, excluding Kirznerian entrepreneurs who institute change within the current equilibrium.

Social Innovation

Given the centrality of social innovation, it is essential to clarify what we mean by this concept. The concept of "social innovation" has multiple and diffuse definitions (Rüede & Lurtz, 2012; Edwards-Schachter & Wallace, 2017), and analysis of these definitions goes beyond the scope of this work. We will use Phills et al.'s (2008) definition that defines "social innovation" as "a novel solution to a social problem that is more effective, efficient, sustainable, or just than existing solutions and for which the value created accrues primarily to society as a whole rather than private individuals" (Phills et al., 2008 p. 36)

From this perspective, a social innovation is a "solution" without specifying the provider. Providers could be government, second- or third-party organizations. In this article, we discuss social innovations initiated by social entrepreneurs.

The Social Entrepreneurial Process

More empirical research and theory building are needed in social entrepreneurship processes in general (Korsgaard, 2011) and Schumpeterian social entrepreneurship processes, in particular. As such, social entrepreneurship process theory draws on a prevalent theory in commercial entrepreneurship.

Opportunity Discovery and Exploitation

Opportunity Discovery and Exploitation play a crucial role in commercial entrepreneurship. Shane and Venkataraman (2000, p. 217-218) developed a conceptual framework for the field, building on the earlier work of Kirzner (1997). They described why entrepreneurial opportunities exist and why some people, and not others, discover and exploit those opportunities. In addition, they considered the different modes of exploitation of entrepreneurial opportunities. They stated that the purpose of this framework was to "advance the quality of empirical and theoretical work in the field.

Several theorists have accepted this conceptual framework that focused on opportunity discovery and exploitation into social entrepreneurship with adaptation to the social context. Thompson et al. (2000), Seelos and Mair (2005), Austin et al. (2000), and Shaw and Carter (2007) contributed to the development of a social entrepreneurial process theory. It has been used as a focus in empirical studies of the social entrepreneurship process (Corner & Ho, 2010; Yitshaki & Kropp, 2016; Nouman & Cnaan, 2022).

In commercial entrepreneurship, theoreticians Barney (2007) and Baker and Nelson (2005) dispute opportunity discovery and exploitation theory, claiming that entrepreneurship theory should rest on opportunity creation rather than opportunity discovery in certain situations. Another approach Dimov (2007) adopted focuses on the evolving nature of entrepreneurial opportunities. Similarly, in social entrepreneurship, Roberts and Woods (2005, p. 49) argue that "opportunities for social change are not discovered like Everest; rather, they are part of a construction process that involves the working and reworking of ideas and possibilities". Finally, some theorists go outside the nexus framework and suggest alternative entrepreneurship theories that are not based on the centrality of opportunities (Davidsson, 2015).

3. Research Objective

The paper aims to understand the entrepreneurial process followed by Schumpeterian social entrepreneurs, emphasizing their objectives, points of entry into the process, connections to the fields of their endeavours, and strategies deployed to change the equilibrium.

This research is important for theory building in social entrepreneurship, with implications for social entrepreneurship encouragement, support, and education.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

4. Methodology

In this study, we used the life story method. This qualitative research method (Macías & Contreras, 2019) comprises a narrative analysis interview approach (Bertaux & Kohli, 1984). The participants were invited to share their life stories in open-ended interviews (Harold et al., 1985). These interviews were analyzed to create a sequence of events in each entrepreneurial process and to identify common and divergent patterns among the different entrepreneurial processes.

This methodology was chosen to understand the entrepreneurial process of social entrepreneurs. In addition to outlining the different processes followed, the method provides insights into past experiences that may have inspired and provided an impetus for social entrepreneurial activities.

The life story method has been widely used in social work research (Veroff et al., 1993; Harold et al., 1995). Subsequently, Steyaert (1997), in his call for the development of entrepreneurship theory, advocated its use in the research of commercial entrepreneurship processes, with Gartner (2010) and Hulsinka and Rauch (2021) recommending its use as well. In the realm of social entrepreneurship research, Cohen and Katz (2016), Yitshaki and Kropp (2016), and Mirvis (2024) all used the life story research method.

5. The Research Process

The researcher interviewed ten Israeli social entrepreneurs, two women and eight men, who had created organizations that met the following criteria:
1. They were social innovators who derived their income from multiple sources, including philanthropy.
2. They could be defined as “Schumpetarian entrepreneurs", reflecting Nandan et al. (2015) and Martin and Osberg’ (2007) definitions of social entrepreneurship since they established new and innovative organizations that have either changed the equilibrium or challenged it.

All organizations established by interviewed entrepreneurs operate in multiple locales. All have operated for at least eight years, are sustainable, and have annual budgets that top 1 million Israeli Shekels. All organizations are currently operating, but one was forced to close after 16 years of operating for reasons unrelated to its quality of service. All entrepreneurs were interviewed for this research over 12 months, from September 2023 to August 2024. One interview occurred face to face; others occurred via Zoom. The interviews lasted between one and 3 hours. All interviews were conducted in the mother tongue of the interviewee, as the researcher is proficient in both Hebrew and English. Three interviews were conducted in English, and seven were conducted in Hebrew. All interviews were recorded and transcribed. An analysis of the interviews followed with a focus on sequences of events for each entrepreneur and a search for common and divergent patterns. Following is Table 1 providing a list of the entrepreneurs’ innovations.

Table 1. A list of the entrepreneurs’ innovations

	Innovation	Beneficiaries	Pre-innovation equilibrium	The post-innovation equilibrium
Education	Online school for teaching colloquial Arabic	Non-Arabic speakers	Lack of accessible colloquial Arabic courses	Online engaging and accessible modules are offered to all who are interested in becoming conversant in Arabic
	Supportive work-centered environments that teach life skills and manufacture decorative candles	High school dropouts	No comprehensive non-educational frameworks	Teens are offered employment in supportive, productive environments that teach them life skills that enable them to become productive members of society
	Supportive agricultural work environments that teach life skills in a	High school dropouts	No comprehensive noneducational	Teens are offered employment in supportive multi-generational agricultural environments that

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

	multi-age environment		frameworks	teach them life skills and enable them to become productive members of society
	Series of single-gender campuses where universities offer courses	The ultra-orthodox population who will not study in co-ed environments	University education is taboo for this population	Ultra-orthodox students enrol in university degree programs
Health care and support	Implementation of a proven unique approach to the rehabilitation of children with hearing loss and deafness	Children with deafness and severe hearing loss	Hearing limitations for life; severe personal, social, and educational implications	Children can hear, communicate verbally with their environment, attend a regular school, and become contributing members of society, thereby realizing their full potential
	Provision of friendship and support to hospitalized children	Children hospitalized for long periods	Isolation from peers; onus of support on parents	Children offered support and social interaction with young volunteers
	Treatment and prevention of addiction among teens	Populations with addiction problems with a focus on teens	No institutional framework for addiction treatment	Individuals suffering from addiction can receive comprehensive treatment. Furthermore, there are organized campaigns to prevent teen addiction
	Provision of immediate emergency medical care	The general population who requires immediate emergency medical care	Emergency care based on timely ambulance arrival	Immediate emergency care provided by paramedics on motorcycles who can successfully negotiate traffic congestion
Miscellaneous	Provision of timely non-medical support to vehicle drivers	Drivers who experience roadside vehicle problems	Aid depends on available commercial emergency providers	Timely gratis roadside assistance provided by volunteers
	Provision of household budget tutoring and mentoring	Families incapable of living within their means	Families in debt drift into poverty	Families can access free family budget tutoring and mentoring

All interviewees were fully informed of the research objectives and provided written consent for their participation.

6. Findings

6.1 The Entrepreneurial Objectives and Points of Entry.

In analyzing the entrepreneurial processes of entrepreneurs, it is possible to differentiate between two different types of entrepreneurs in terms of their objectives and points of entry—the first comprising entrepreneurs who sought to capture social value and were opportunity-focused. The second type comprised those who focused on solving social problems after responding to “a call to action”.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

Social Value Capture through Opportunity Focus. Three entrepreneurs followed the opportunity focus pattern. The first focuses on opportunity discovery and exploitation, the second on opportunity pursuit, and the third on opportunity creation.

Opportunity Discovery and Exploitation

Teaching Colloquial Arabic. The entrepreneur had the skills to teach colloquial Arabic. His friends encouraged him to gather a team to design "colloquial Arabic modules for beginners" and to post them on YouTube. He received positive responses to these episodes and requests for additional modules. He and his team realized that there was a market for these modules, and two years later, they decided to raise funds through crowdfunding to grow the venture. The entrepreneur discovered the social value of teaching colloquial Arabic to large audiences. In his own words, he "realized that this project was not about teaching friends Arabic and taking them to the Old City (of Jerusalem); in teaching hundreds and thousands of people to speak, we were influencing social norms" (translation). This project enables course graduates to communicate with Israel's Arab population in their native tongue, providing a communication bridge in a region where populations live in conflict. As such, a great emphasis was placed on growing the market, with the modules being highly engaging and offered gratis.

Opportunity Pursuit

Provide Joy and Support for Hospitalized Children. A second entrepreneur, whose profession was in the realm of commerce, embarked on a search for opportunities to create social value. A fundraiser approached him with experience raising funds for a healthcare-related organization to develop a project in this area. The entrepreneur interviewed hospital personnel to create a project to address sick children's unmet needs. As he noted, he "started talking to the doctors, nurses, social workers, parents, and the kids about what the needs were, and soon it became obvious that there were kids with chronic illnesses with long-term rehab or treatment that were not being dealt with by any organization. No organization was there for them, helping them what they needed". While the hospitals provided excellent medical care, no organization responded to the negative ramifications of long periods of isolation for young patients. This research prompted him to establish a "Big Brother", "Big Sister" type organization that would recruit volunteers to "adopt" the children undergoing treatment and support them throughout their hospitalization. The project was piloted in two hospitals and was thereafter offered nationally.

Opportunity Creation

Developing a Multi-Age Supportive Agricultural Farm for School Dropouts. A third entrepreneur took a year-long "timeout" after an intensive decade as an educator in the formal system. During this year, he desired to work with his hands and embarked on some carpentry projects. He was deliberating what to do next when a former student reminded him of his dream to develop a farm and provide a multi-age working environment for high school dropouts. He recalled the idea and his enthusiasm, inviting his friends to join him on this venture: "I invited them to join me in a week to work with me on this project. However, I had no farm and had no land" (translation). Within a week, he created the opportunity. He secured unused wasteland plots in the area of an agricultural village in which he lived, and within a few months, he was able to run a pilot program for high school dropouts. Teens who refused to "get out of bed" for school flocked to work, with many ultimately studying for the matriculation examinations. This model has been replicated in two other regions as well as overseas.

Response to a Call to Action

Seven entrepreneurs began their entrepreneurial process with an aspiration to solve a social problem as a response to what they perceived to be a call to action. This perception was triggered by a highly significant and unexpected adverse event that prompted six out of seven interviewees to change their career paths and embark on their entrepreneurial journeys. The seminal events that provoked responses were personal, social, and national.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

Personal Event

These events affected the entrepreneurs personally. The reaction of the first was to solve the problem for herself and others, while the response of the second entrepreneur was to ensure that others did not experience the same event.

Two-year-old twin daughters were diagnosed with deafness. The entrepreneur was a young educator when her 2-year-old twins were diagnosed with deafness. In her words: "I was at the supermarket with one of my twins. This was rare since we usually took the two together wherever we went. She ran ahead, and I called her to wait. She did not respond. I switched to Hebrew and even called her by her and her sister's name, thinking that perhaps she did not know which of the twins she was, but still, there was no response. We took the twins to a hearing test, and both were diagnosed with deafness. I was distraught. A social worker recommended we enrol our twins in a kindergarten for children with deafness, and after visiting the school, I was even more distraught. I shared my woes with my sister in Canada, who told me about a treatment for child deafness that combined the use of technology and intensive exposure to spoken language through speech therapy. I jumped on the opportunity to provide my children with normative speech and language. When the FDA approved cochlear implants for children, my girls were among the first to receive this new technology that would enable them to hear. At the beginning of our personal family journey, I became the head of the Israeli branch of the organization. Now, 30 years hence, my daughters are combining technology and intensive exposure to spoken language through speech therapy. I jumped on the opportunity to provide my children with normative speech and language. When the FDA approved cochlear implants for children, my girls were among the first to receive this new technology that would enable them to hear. Although at the beginning of our personal family journey, I became the head of the Israeli branch of the organization, and now 30 years hence, my daughters are communicative, integrated citizens, as well as hundreds of other children who were born with the same disability."

There were streams of passing cars, and no one pulled over to help. The entrepreneur was a manager of a men's fashion chain. He began his day at 5 am and, one winter morning, failed to start his car. He realized that he needed to jump-start the battery, which in those days would require the help of a second vehicle. He opened the car bonnet, connected the jump leads, and waited for passing vehicles to come to his aid. He recalls: "I waited an hour and a half in the rain and cold, yet despite the passing car streams, nobody stopped to help me. I was angry and disappointed, but ultimately, I was thankful because this motivated me to start this project. I wondered how there could be so many people in need of help and so many willing to help, yet there is no connection. Immediately after that, I created a WhatsApp group to provide mutual help in such situations" (translation). The entrepreneur grew this group, and within five years, the volunteer organization he founded could offer roadside first aid across the country to all in need.

Social Encounter

These events occurred through interactions with others, with four entrepreneurs responding to calls of this nature. In two situations, the entrepreneurs were challenged to solve the problems of individuals they knew under stress. Subsequently, they created organizations to solve the issues of wider circles in similar predicaments. In the other two situations, the responses were evoked by the tragic deaths of others and the resolve of the entrepreneurs to ensure there would not be a recurrence of these events.

An Unexpected Call for Help from a Former Mentee. The entrepreneur was a psychology student when he mentored a 10th-grade student as part of a year-long university volunteer project. Two years later, he received an unexpected call. He recalled, "I was sitting in a coffee shop with my wife when he called. Can you please come and fetch me from the beach? I live here in a tent. Astonished and confused, I fetched and took him home" (translation). The entrepreneur took him under his wing and arranged a work schedule, paying attention to the work's power in rehabilitating at-risk youth. Through this former mentee, he discovered the phenomenon of school dropouts who become "transparent" to the official authorities without any authority to address their needs. Cognizant of this vacuum, he felt compelled to create a supportive work environment that would enable these dropouts to realize their potential and contribute positively to society.

Realizing the Need for Household Budgeting Instruction. The entrepreneur was a yeshiva student and invested time in helping people experiencing poverty. A young divorcee with young children experienced severe

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

financial difficulties. In his efforts to help her, he came to a settlement with a bank that threatened to close her account. He secured a loan on her behalf and ensured she had the resources to repay it. The entrepreneur describes the events that occurred. "The woman did not fulfill her commitments to the bank, and the bank called me claiming that my loan had defaulted. Filled with anger, I went over and started screaming at her. She burst out crying, claiming that she did not understand the situation. Suddenly, I realized that she had no understanding of simple budgeting. She did not realize that all expenses should be covered by income" (translation). The entrepreneur sat with her and taught her how to budget. Word spread that he had the skill of teaching people to live within their budgets, and many turned to him for help. Given this growing interest, the entrepreneur founded an organization that recruited volunteers to teach the public, at large, the mechanics of household budgeting.

*The Trauma of Being Unable to Save a Child's Life***.** As a volunteer paramedic, an entrepreneur witnessed the death of a child who choked while eating. A doctor in the area arrived too late to save the child. In the entrepreneur's words, this was his call to action. "A mother called for help when her seven-year-old son choked on lunch. It took us 21 min to arrive. Upon arrival, we saw the mother on the floor next to her son, crying and begging for our help to save his life. I was only 16. I was crying with her. While I was performing CPR, a man, a doctor who lived around the corner, ran into the house. After helping us, he apologized that the child was not alive. That was the worst moment in my life. I realized that the doctor lived a block away, but he did not know about the emergency until we arrived. That is when I said, "ambulances don't save lives; people save lives". This incident inspired the entrepreneur to create a real-time system to offer emergency medical care. He began by purchasing scanners to pick up calls to the ambulance service and dispatch paramedics to the scene. As he built the organization, he recruited and trained multiple volunteer paramedics and instituted a motorbike heavily equipped with emergency medical supplies that enabled paramedics to administer timely emergency care even when the streets were congested.

Personal Request from a Wealthy Fatal Victim of Drug Addiction. The entrepreneur was a young Israeli rabbi ministering to a community in Central America. Through his community service, he was surprised to learn that drug addiction was not only a problem among the poor but also among the rich. As the entrepreneur explained, "A wealthy member of the community approached me about his cocaine addiction. I began to contemplate what I could do. Sadly, he passed away from an overdose a few days later. At the funeral, his daughter brought me a letter from her father in which he described his suffering. He requested that I do everything in my power to ensure that others would not suffer and die because of this terrible white powder. I interpreted this as his will and testimony, which became my life mission." (translation). The wealthy individual left him a small sum to start an organization, and the entrepreneur began to teach himself how to treat addiction. A few years later, the rabbi returned to Israel and built a center for the treatment and prevention of addiction.

National Event.
*The Assassination of Israel's Prime Minister***.** The assassination of Israel's Prime Minister Rabin in 1995 was a call to action for the entrepreneur who established an academic platform for the ultra-Orthodox. The secular media blamed the ultra-Orthodox, who were among the poorer sections of society, for benefiting from welfare and not making economic contributions to the economy. The entrepreneur, an ultra-Orthodox fashion designer and daughter of an influential rabbi, felt pressed to find a way to improve the financial plight of her community. "I had a terrible conscience", she recalls, "how could I continue life as normal?" (Translation). This led her to pursue a solution earnestly. In her pursuit, she heard a lecture by an influential economist on the importance of university education for economic mobility. With this insight, she realized the importance of university education for the ultra-Orthodox, yet understood that coeducational campuses were a barrier to enrollment. She thus established single-gender campuses and invited the universities to offer their courses on these campuses.

6.2 Life Commitment

Seven of the enterprises were established more than 25 years ago. Eight entrepreneurs will continue to hold Chairman of the Board or CEO positions. One entrepreneur resigned after 20 years, while a second left office when the enterprise was closed by regulators after 16 years of activity.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

6.3 Insiders and Outsiders

The in-depth interviews revealed that only two entrepreneurs were "insiders". They knew about the fields in which they were engaged and developed their enterprises with a clear sense of direction. These two entrepreneurs were among the "entrepreneurial opportunity" category of entrepreneurs who discovered and created opportunities for social value. Seven of the remaining eight were "outsiders" with no previous professional experience. One entrepreneur was a trained volunteer with experience in his field, and as such, he was professionally an outsider but a knowledgeable insider.

6.4 Past volunteering

Eight of the ten entrepreneurs mentioned having volunteered in the past, mentioning the satisfaction they had derived and the empathy they had developed for those with whom they had volunteered. Three responses to a call to action directly resulted from these volunteer experiences.

6.5 Equilibrium Change Strategies

There are four key areas where all social entrepreneurs need to succeed in challenging the equilibrium: the product or service, personnel, pennies, and politics (Mirvis, 2024). These areas are also interdependent and essential for success. The ability to develop an excellent product or service and employ excellent personnel may depend on the pennies, i.e., finances. Similarly, the ability to receive support from local councils and government bodies may depend on politics. Finally, support from local councils and the government may rely on the quality of the services offered or the product developed.

Development of Products and Services

Expertise in the Area of the Endeavor. In developing a product or service, those experts in the field build on their experience. One entrepreneur took a course that enabled him to become an expert. The second one consulted with experts in the field and built his endeavors on their wisdom. Three other entrepreneurs decided to learn "by doing". They had intuitive knowledge regarding how to start the development phase and learned by trial and error how to complete it. Two entrepreneurs teamed up with experts in the field to develop their enterprises. One entrepreneur employed a CEO who had the expertise to create the service.

*Product and Service Development***.** All entrepreneurs developed their products and services through piloting. The responses from the field were fed into further developments that were tested in the field.

*Scaling up***.** The following factors contributed to the ability of the organization to scale its services:

A. Creation of platforms that can operate in one of the following ways:
    1. Digital platforms that allow beneficiaries to access services;
    2. Rental of a physical structure that enables an outside provider to offer services;
    3. A communication platform would allow people living nearby to receive the service in real-time.
B. Introduction of new products to meet the needs of a larger group of beneficiaries.
C. Financial accessibility. Seven organizations offered their services gratis, while three charged highly subsidized fees.

Personnel

All organizations tried to recruit and retain staff dedicated to the organization's ethos. Thus, in most organizations, staff turnover was limited. Staff retention was achieved by creating an atmosphere of camaraderie and fair wages. In addition, four organizations base their services on volunteer work. Their ability to attract dedicated volunteers was due to the following:

1. The volunteers received training and were acknowledged for their volunteer work.
2. They had meaningful interactions with beneficiaries.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

3. They determined their time commitment. As such, those holding demanding professional positions could tailor their volunteer work to match their professional commitments.

Funding (Pennie's)

Seven organizations operated with volunteer work in their first stages. As the organizations grew, they deployed the following sustainability strategies:

1. As mentioned, four organizations were staffed mainly by volunteers. One organization made volunteerism a central ethos, so there are no paid employees. The CEO holds a paid professional position during work hours, and he/she operates as the organization's CEO in the "after hours".
2. The government almost entirely funded one organization, while two others secured significant government funding for their services. Three secured partial funding, and four operated without government support.
3. Two organizations operated social enterprises that provided most of their required income.
4. One organization that offered its services accessible to the public was able to offer a lucrative "premium service" to corporations.
5. Nine organizations engaged in fundraising, with four raising most of their funds overseas.

Politics

In some situations, organizations that operate in the health and education fields are affected by government regulation. Furthermore, regularly fulfilling requirements was often a prerequisite for receiving government funds.

In many situations, existing organizations that received government funding and offered services of lesser quality did all to protect their turf, making it extremely difficult for the new organizations that offered superior services. One organization had to make great efforts to convince the authorities that it was combating a genuine problem, a second commissioned an evaluation despite its exceptional service and a third was closed down by the regulators despite its success.

7. Discussion

The primary finding is the differentiation between the two types of entrepreneurs in terms of their objectives and points of entry—the first comprised entrepreneurs who sought to capture social value and were opportunity-focused. The second type comprised those who focused on solving social problems having responded to "a call to action".

This finding correlates with Mirvis's findings on Schumpeterian religious education entrepreneurs (Mirvis, 2024). Mirvis's research focused on entrepreneurs with religious commitment; therefore, one could assume that their response to a call to action resulted from their religious beliefs. However, this research shows that this response is also prevalent among general social entrepreneurs.

This finding raises a question regarding a theory source for enhancing social entrepreneurship, whose primary motivation is to solve social problems. Commercial entrepreneurship theory focusing on entrepreneurial opportunities, such as opportunity discovery and recognition, opportunity pursuit (Shane & Venkataraman, 2000), or opportunity creation (Baker & Nelson, 2005; Alvarez & Barney, 2007), could serve opportunity-driven social entrepreneurship. However, social entrepreneurship that responds to calls to action with an emphasis on solving social problems may require a different theory.

A second discipline that could be a resource for theory is social innovation. However, while social innovation is a growing field of practice, social innovation theory remains underdeveloped (Mulgan, 2019). Furthermore, the central focus of social innovation enhancement is moving toward a systematic approach that goes beyond "excessive faith in heroic individuals" (Mulgan, 2006, p. 160). Therefore, the discipline of social innovation currently needs to be a source.

A second significant finding is the large group of "outsiders" who established Schumpeterian enterprises. This finding is reflected among other Schumpeterian entrepreneurs, e.g., Mohammud Yunus's establishment of the

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

Grameen Bank in Bangladesh (Bornstein, 1997) and Erzsébet Szekeres' establishment of assisted living centers for the disabled in Hungary (Bornstein, 2004). An analysis of the interviews with the entrepreneurs revealed a strong critique of the prevailing equilibrium, coupled with a high level of innocence regarding their ability to create change. This finding begs further research

A third significant finding is a correlation between a personal history of volunteering and a willingness to become a social entrepreneur. This finding is vital for social entrepreneurship education. If there is a correlation, meaningful volunteer experience should be a prerequisite for participating in programs that enhance social entrepreneurship.

A fourth significant finding is the predominance of two factors that enhanced the scaling up of organizations' services: the mobilization of large numbers of committed volunteers and the use of platforms to operate the organization's services. This finding is not novel; Pardess (2005) focused on mobilizing volunteers, while Landoni and Trabucchi (2024) analyzed their use in nonprofit organizations. However, it is worth noting, given its importance to social entrepreneurship education.

8. Conclusion

This research aimed to understand the entrepreneurial process followed by Schumpeterian social entrepreneurs, emphasizing their objectives, points of entry into the process, and connections to the fields of their endeavors and strategies deployed to change the equilibrium. Ten Israeli "Schumpeterian" social entrepreneurs were chosen and interviewed using the life story method.

The key findings were as follows:
1. The research highlighted two types of entrepreneurs and their objectives and starting points.
The first comprised entrepreneurs who sought to capture social value and were opportunity-focused. The second type comprised those who focused on solving social problems by responding to "a call to action":
2. There was a large majority of "outsiders" among the entrepreneurs.
3. There is a possible correlation between a personal history of volunteering and a willingness to become a social entrepreneur.
4. There is a predominance of two factors that enhanced the scaling up of organizations' services: the mobilization of large numbers of committed volunteers and the use of platforms to operate organizations' services.

In relation to these findings, the limitations of the life story method must be noted. This methodology relies on the memory and self-reflection of the interviewees. In relaying their life stories, the interviewees could have erred regarding the sequences of critical events or may have needed to be more selective in relaying their narratives. Thus, future research should be carried out with this same research objective utilizing a different methodology.

Notwithstanding the above, the findings of this research may contribute to the development of theory in the realm of Schumpeterian social entrepreneurship and make a worthwhile contribution to social entrepreneurship education.

References

Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal*, 1(1-2), 11-26. https://doi.org/10.1002/sej.4

Austin, J., Stevenson, H., & Wei-Skillern, J. (2006). Social and commercial entrepreneurship: same, different or both? *Entrepreneurship: Theory & Practice*, 30 (1), 1-22. https://doi.org/10.1111/j.1540-6520.2006.00107.x

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: Resource construction through entrepreneurial bricolage. *Administrative Science Quarterly*, 50(3), 329-366. https://doi.org/10.2189/asqu.2005.50.3.329

Bertaux, D., & Kohli, M. (1984). The life story approach: A continental view. *Annual Review of Sociology*, 215-237. https://doi.org/10.1146/annurev.so.10.080184.001243

Bornstein, D. (1997). The price of a dream: The story of the Grameen Bank. Oxford University Press

Bornstein, D. (2004). How to change the world: Social entrepreneurs and the power of new ideas. Oxford University Press https://doi.org/10.1353/cye.2005.0027

Boschee, J., & McClurg, J. (2003). Toward a better understanding of social entrepreneurship: Some important distinctions (White Paper). http://www.caledonia.org.uk/papers/Social-Entrepreneurship.doc Ret. 15/09/2024

Cohen, H., & Katz, H. (2016). Social entrepreneurs narrating their careers: A psychodynamic-existential perspective. *Australian Journal of Career Development*, 25(2), 78-88. https://doi.org/10.1177/1038416216658046

Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: A reconceptualization. *Journal of Business Venturing*, 30(5), 674-695. https://doi.org/10.1016/j.jbusvent.2015.01.002

Edwards-Schachter, M., & Wallace, M. L. (2017). 'Shaken, but not stirred': Sixty years of defining social innovation. *Technological Forecasting and Social Change*, 119, 64-79. https://doi.org/10.1016/j.techfore.2017.03.012

Estrin, S., Korosteleva, J., & Mickiewicz, T. (2020). Schumpeterian Entry: Innovation, Exporting, and Growth Aspirations of Entrepreneurs. *Entrepreneurship Theory and Practice*, 46(2), 269-296 https://doi.org/10.1177/1042258720909771

Cho, A. H. (2006). Politics, values and social entrepreneurship: A critical appraisal. In J. Mair, J. Rob-inson, & K. WHockerts (Eds.), Social entrepreneurship (pp. 34 -56). Basingstoke, UK: Palgrave Macmillan. https://doi.org/10.1057/9780230625655_4

Corner, P. D., & Ho, M. (2010). How opportunities develop in social entrepreneurship. *Entrepreneurship Theory and Practice*, 34(4), 635-659. https://doi.org/10.1111/j.1540-6520.2010.00382.x

Dacin, P. A., Dacin, M. T., & Matear, M. (2010). Social entrepreneurship: Why we don't need a new theory and how we move forward from here. *Academy of Management Perspectives*, 24(3), 37-57. https://doi.org/10.5465/AMP.2010.52842950

Dimov, D. (2007). Beyond the single-person, single-insight attribution in understanding entrepreneurial opportunities. Entrepreneurship theory and practice, 31(5), 713-731. https://doi.org/10.1111/j.1540-6520.2007.00196.x

Dees, J. G. (2001). The meaning of social entrepreneurship (Original draft: 1998) https://centers.fuqua.duke.edu/case/wp-content/uploads/sites/7/2015/03/Article_Dees_MeaningofSocialEntrepreneurship_2001.pdf Ref 15/09/2024

Dees, J.G., & Anderson, B. B. (2006). Framing a theory of social entrepreneurship: Building on two schools of practice and thought. Research on social entrepreneurship, 39-66. https://www.ashoka.org/sites/default/files/2019-11/Research%20on%20Social%20Entrepreneurship%20-%20Understanding%20and%20Contributing%20to%20an%20Emerging%20Field.pdf#page=39 Ref. 15/09/2024

Ebner, A (2024). Innovation in economic evolution: Reintroducing Schumpeterian thought to current advances in economic sociology. *Current Sociology*, Early Access https://doi.org/10.1177/00113921241271850

Gartner, W. B. (2010). A new path to the waterfall: A narrative on a use of entrepreneurial narrative. International small business journal, 28(1), 6-19. https://doi.org/10.1177/0266242609351448

Harding, R. (2004). Social enterprise: The new economic engine? *Business and Strategy Review*, 15(4), 39-43 https://doi.org/10.1111/j.0955-6419.2004.00338.x

Harold, R. D., Palmiter, M. L., Lynch, S. A., & Freedman-Doan, C. R. (1995). Life stories: A practice-based research technique. *J. Soc. & Soc. Welfare*, 22, 23. https://doi.org/10.15453/0191-5096.2239

Hulsink, W., & Rauch, A. (2021). About the lives and times of extraordinary entrepreneurs: The methodological contribution of autobiographies to the life course theory of entrepreneurship. *Journal of Small Business Management*, 59(5), 913–945. http://doi.org/10.1080/00472778.2020.1865538

Kao, R. W. (1993). Defining entrepreneurship: past, present and? *Creativity and Innovation Management*, 2(1), 69-70 https://doi.org/10.1111/j.1467-8691.1993.tb00073.x

Kirzner, I. M. (1997). Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35(1), 60-85. https://www.jstor.org/stable/2729693

Kirzner, I. M. (2009). The alert and creative entrepreneur: A clarification. Small Business Economics, 32, 145-152. https://doi.org/10.1007/s11187-008-9153-7

Kramer, M. (2005). Measuring Innovation: Evaluation in the Field of Social Entrepreneurship. Prepared for The Skoll Foundation by Foundation Strategy Group https://www.scribd.com/document/8233430/Measuring-Innovation-Mark-R-Kramer-Skoll-and-FSG-Report-2005 Ret. 15/09/2015

Korsgaard, S. (2011). Opportunity formation in social entrepreneurship. *Journal of Enterprising Communities: People and Places in the Global Economy*, 5(4), 265-285. https://doi.org/10.1108/17506201111177316

Landoni, P., & Trabucchi, D. (2024). Non-profit and hybrid organizations as multi-sided platforms: insights from the analysis of sustainability models. *European Journal of Innovation Management*, 27(9) https://doi.org/10.1108/EJIM-08-2023-0641

Light, P. (2006). Reshaping Social Entrepreneurship. *Stanford Social Innovation Review*, 4(3), 47-51. https://doi.org/10.48558/TX2B-G208

Macías, C. J. G., & Contreras, T. J. C. (2019). The life story: A social qualitative research method and its application in tourism management studies. *RITUR-Revista Iberoamericana de Turismo*, 59-77. http://orcid.org/0000-0002-3476-3095

Mair , J., & Marti, I. (2006). Social entrepreneurship research: A source of explanation, prediction, and delight. *Journal of World Business*, 41(1), 36-44. https://doi.org/10.1016/j.jwb.2005.09.002

Martin, R., & Osberg, S. (2007). Social Entrepreneurship: The Case for Definition. Stanford Social Innovation Review, 29-39. https://web.mit.edu/sloan2/dese/readings/week01/Martin_Osberg_SocialEntrepreneurship.pdf Ret. 15/09/24

Mirvis, J. (2024). The Entrepreneurship Process of Western Immigrants Who Have Impacted Religious Education in Israel: A Qualitative Study. *Religious Education*, 119(1), 59-75. https://doi.org/10.1080/00344087.2023.2283667

Mulgan, G. (2006). The Process of Social Innovation. *Innovations: Technology, Governance, Globalization*, 1(2), 145-162. https://doi.org/10.1162/itgg.2006.1.2.145

Mulgan, G. (2019). The Theoretical Foundations of Social Innovation: Sources, Ideas and Future Directions. In: Social Innovation: How Societies Find the Power to Change, p.111-136. https://doi.org/10.46692/9781447353805.009

Nicholls, A. (2006). Introduction in A. Nicholls, ed. Social Entrepreneurship: New Models of Sustainable Social Change. Oxford University Press, Oxford, UK, p. 1-35. https://doi.org/10.1093/oso/9780199283873.003.0001

Nandan, M., London, M., & Bent-Goodley, T. (2015). Social workers as social change agents: Social innovation, social intrapreneurship, and social entrepreneurship. *Human Service Organizations: Management, Leadership & Governance*, 39(1), 38-56. https://doi.org/10.1080/23303131.2014.955236

Nouman, H., & Cnaan, R. A. (2022). Social entrepreneurship in social work: Opportunities for success. *Journal of the Society for Social Work and Research*, 13(1), 27-46. https://doi.org/10.1086/715441

Pardess, E. (2005). Training and mobilizing volunteers for emergency response and long-term support. *Journal of Aggression, Maltreatment & Trauma*, 10(1-2), 609-620. https://doi.org/10.1300/J146v10n01_19

Payne, D. G., & Newman, R. S. (2005). Benjamin Franklin (1706-1790). In The Palgrave Environmental Reader, pp. 19-25. New York: Palgrave Macmillan US. https://doi.org/10.1007/978-1-349-73299-9_4

Perrini, F., & Vurro, C. (2006). Social Entrepreneurship: Innovation and Social Change Across Theory and Practice. In: Mair, J., Robinson, J., Hockerts, K. (eds) Social Entrepreneurship. Palgrave Macmillan, London. https://doi.org/10.1057/9780230625655_5

Phills, J. A. Jr., Deiglmeier, K., & Miller, D. T. (2008). Rediscovering Social Innovation. *Stanford Social Innovation Review*, 6(4), 34-43.

Roberts, D., & Woods, C. (2005). Changing the world on a shoestring: The concept of social entrepreneurship. *University of Auckland Business Review*, 7(1).
https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=3ab45694a2262a2e0f9bd666911ee0a4c058115f Retr. 15/09/2024

Robinson, J. (2006). Navigating social and institutional barriers to markets: How social entrepreneurs identify and evaluate opportunities. In J. Mair, J. Robinson, & K. Hockerts (Eds.), Social entrepreneurship. Basingstoke, UK: Palgrave Macmillan https://doi.org/10.1057/9780230625655_7

Rüede, D., & Lurtz, K. (2012). Mapping the various meanings of social innovation: Towards a differentiated understanding of an emerging concept. EBS business school research paper, (12-03). https://doi.org/10.2139/ssrn.2091039

Saebi, T., Foss, N. J., & Linder, S. (2019). Social entrepreneurship research: Past achievements and future promises. *Journal of Management*, 45(1), 70-95. https://doi.org/10.1177/0149206318793196

Schumpeter, J.(2000). Entrepreneurship and Innovation. In Entrepreneurship: The social science view, ed. Richard Swedberg,51-76. Oxford, New York: Oxford University Press. https://doi.org/10.1093/oso/9780198294627.003.0003

Seelos, C., & Mair, J. (2005). Social entrepreneurship: Creating new business models to serve the poor. *Business Horizons*, 48(3), 241-246. https://doi.org/10.1016/j.bushor.2004.11.006

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217-226. https://doi.org/10.5465/amr.2000.2791611

Shaw, E., & Carter, S. (2007). Social entrepreneurship: Theoretical antecedents and empirical analysis of entrepreneurial processes and outcomes. *Journal of Small Business And Enterprise Development*, 14(3), 418-434. https://doi.org/10.1108/14626000710773529

Steyaert, C. (1997). A qualitative methodology for process studies of entrepreneurship: Creating local knowledge through stories. *International Studies of Management & Organization*, 27(3), 13-33. https://doi.org/10.1080/00208825.1997.11656711

Sobel, R. S. (2015). Economic freedom and entrepreneurship. What America's decline in economic freedom means for entrepreneurship and prosperity, 37-66
https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=b34f7bba4b20637d4b637488350a5aa7fb93a864#page=43
Ref 15/09/2024

Thompson, J., Alvy, G., & Lees, A. (2000). Social entre-preneurship-a new look at the people and the potential. *Management Decision*, 38, 328 -338 https://doi.org/10.1108/00251740010340517

Tracey, P., & Phillips, N. (2007). The distinctive challenge of educating social entrepreneurs: A postscript and rejoinder to the special issue on entrepreneurship education. *Academy of Management Learning & Education*, 6, 264-271.
https://doi.org/10.5465/amle.2007.25223465

Van Praag, C. M. (1999). Some classic views on entrepreneurship. *De economist*, 147, 311-335.
https://doi.org/10.1023/A:1003749128457

Veroff, J., Sutherland, L. Chadiha, L. & Ortega R. (1993). Newlyweds tell their stories: A narrative method for assessing marital experiences. *Journal of Social and Personal Relationships*, 11, 437-457. https://doi.org/10.1177/0265407593103010

Waddock, S., & Post, J.E.. (1991). Social Entrepreneurs and Catalytic Change. *Public Administration Review*, 51(5), 393-401.
https://doi.org/10.2307/976408

Worsham, E. L. (2012). Reflections and insights on teaching social entrepreneurship: an interview with Greg Dees. *The Academy of Management Learning and Education*, 11(3), 442-452. https://doi.org/10.5465/amle.2011.0024

Yitshaki, R., & Kropp, F. (2016). Motivations and opportunity recognition of social entrepreneurs. *Journal of Small Business Management*, 54(2), 546-565. https://doi.org/10.1111/jsbm.12157

Zahra, S. A., Gedajlovic, E., Neubaum, D. O., & Shulman, J. M. (2009). A typology of social entrepreneurs: Motives, search processes and ethical challenges. *Journal of Business Venturing*, 24(5), 519-532. https://doi.org/10.1016/j.jbusvent.2008.04.007

Ziemnowicz, C. (1942). Joseph A. Schumpeter and innovation. *Socialism and Democracy*, 2(1), 2-4.

Jonathan MIRVIS
ORCID ID: https://orcid.org/0000-0002-8588-6984

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j6547986272

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

Publisher
http://jssidoi.org/esc/home

HIGH-PERFORMANCE WORK SYSTEMS AND THEIR IMPACT ON FINANCIAL PERFORMANCE IN SMES*

Dana Jašková [1], Katarína Kráľová [2], Jana Sochuľáková [3]

[1,2,3] Alexander Dubček University of Trenčín, Študentská 3, 911 50 Trenčín, Slovakia

E-mails:[1] dana.jaskova@tnuni.sk (Corresponding author); [2]katarina.kralova@tnuni.sk; [3]jana.sochulakova@tnuni.sk

Received 11 July 2024; accepted 25 October 2024; published 30 December 2024

Abstract. Small and medium-sized enterprises (SMEs) are a significant source of wealth and employment in economies. Enterprises must use modern systems to manage their employees in an increasingly turbulent business environment. These systems will help them to improve their financial performance and gain a competitive advantage in the marketplace. This study examined the role of High-Performance Work Systems (HPWS) as a predictor of SMEs' financial performance (FP) based on the link between human resource management and economic performance. The study examined the mediating role of SMEs' reputation (RE) and SMEs' social value (SV) in the relationship between HPWS and FP and the direct relationship between these constructs. The study quantifies this relationship in the context of human resource management in small and medium-sized enterprises in Slovakia. Data were collected from 128 SME owners/managers through a questionnaire instrument. Partial least squares structural equation modelling (PLS-SEM) using Smart PLS 4 was used to test the study's hypotheses. The study highlighted a significant positive effect of HPWS on all RE, SV and FP constructs. In addition, this study also confirmed the mediating role of RE in the relationship between HPWS and FP. The expected direct mediating effect of the SV construct between HPWS and FP was not confirmed. The study also includes limitations and recommendations for future research.

Keywords: high-performance work systems; financial performances; small and medium-sized enterprises; social value; company`s reputation

Reference to this paper should be made as follows: Jašková, D., Kráľová, K., Sochuľáková, J. (2024). High-performance work systems and their impact on financial performance in SMEs. *Entrepreneurship and Sustainability Issues*, 12(2), 163-175. http://doi.org/10.9770/e5377654439

JEL Classifications: C31, C83, O30

1. Introduction

Small and medium-sized enterprises (SMEs) are vital to any country's economy. Their importance and relevance are multifaceted, and they intervene in various economic, social or societal areas. SMEs are an essential and invaluable source of jobs. According to recent studies, in most countries, SMEs account for 90% of enterprises and employ about 60% of the world's workforce (Naradda Gamage et al., 2020). Thus, SMEs are the most productive sector in creating jobs (Auzzir et al., 2018). By creating employment opportunities for different demographic groups, including young people, school leavers, women, senior citizens, and vulnerable groups, SMEs help to reduce unemployment and social inequalities in the economy. SMEs help eradicate poverty, inequality and unemployment in rural regions, support people in meeting their basic needs and help marginalised groups such as people with disabilities, female-headed households, uneducated, unskilled labour force and rural

* *This research was funded by the Slovak Ministry of Education's Scientific grant agency VEGA 1/0718/22 Human resources development in small and medium-sized enterprises in the context of the 21st century challenges*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

families (Fiseha & Oyelana, 2015). SMEs reduce regional disparities, promote balanced economic development, and relieve pressure on large cities. They are also an important centre for innovation and the creation of new technologies. Their smaller size and flexibility are an advantage for them in this case, as it allows them to be faster and more flexible in adapting to new trends and market needs. Unlike large companies, SMEs are highly resilient to technical change and have better adaptability to market fluctuations while making quick decisions due to their organisational structure (Baeshen et al., 2021). SMEs, the cornerstone of the economy's business structure and a key creator of employment and wealth, increasingly need a competitive and better-prepared workforce to compete in a fiercely competitive environment. In recent years, there has been a lot of research and debate on what human resource practices should be used in businesses to achieve employee prosperity and well-being, thereby ensuring the retention of skilled workers in the company, which would help SMEs to achieve greater efficiency, competitive growth and better financial performance. Nowadays, enterprises are moving towards implementing modern human resource management systems in the enterprise, which enable enterprises, not only large enterprises but also SMEs, to gain a competitive advantage and improve their financial performance. Changes in human resource management systems require enterprises to innovate. From the perspective of efficiency theory, the adoption of management innovations by enterprises is influenced by the efforts of these enterprises to achieve defined business. Similarly, adopting human resource management innovations such as HPWS is considered voluntary and rational behaviour by the enterprise to enhance its overall performance viability. HPWS can be viewed as an advanced system of human resource management practices in an enterprise, which should result in improved employee skills, higher employee commitment, and higher employee well-being (Xiao & Cooke, 2022).

Unlike other more conventional human resource management systems, HPWS promotes organisational flexibility, emphasises employee autonomy, and encourages knowledge transfer. HPWS seeks to improve performance through effective management of people and resources. HPWS leads SMEs to sustainable performance in the presence of innovative work behaviours that result from the practical application of HPWS in enterprises and come through the active involvement of employees in work activities.

2. Development of hypotheses based on theory

The performance of SMEs can be analysed and monitored from a quantitative perspective: efficiency, production levels, number of customers, etc., and from a qualitative perspective: goal achievement, leadership style, employee behaviour, customer satisfaction, product and process innovation, organisational and marketing innovation, etc. Anyway, financial performance is of crucial importance.

2.1 High-performance work systems (HPWS) and financial performance of SME (FP)

The growth of competitiveness and financial performance in an enterprise is also closely related to innovation. Innovation is a crucial determinant of the success of any enterprise. Therefore, based on the preceding text, the introduction and implementation of HPWS in SMEs is a management innovation that improves the performance of the enterprise. High-performance work systems (HPWS) have positively influenced a firm's financial performance retention, productivity, efficiency and flexibility, and employee commitment. Some studies have argued that the relationship between a firm's human resource management practices and firm performance varies depending on whether the firm's performance is measured in operational or financial terms (e.g., Tzabbar et al., 2017; Morán et al., 2024).

Other research has suggested that the relationship between a firm's human resource management practices and firm performance is invariant across performance indicators. However, these studies were primarily based on previous research on individual human resource management practices rather than on human resource management practices as a system overall. Integrated human resource management practices into one system, known as a high-performance work system (HPWS), have been the subject of investigation by various researchers for decades (Kaushik & Mukherjee, 2022), who, among other things, analyse in their studies, for example, how HPWS affect the financial performance of a company. Many studies have found that using the HPWS package is relatively low in small firms (Kaushik & Mukherjee, 2022). Thus, one unresolved question is whether this low utilisation is the result of smaller firms simply doing a little bit of everything but in a less sophisticated way than larger firms (Sun & Mamman, 2022) or whether smaller firms deliberately adopt smaller

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

packages of procedures instead of the entire comprehensive HPWS system. This path has yet to be explored much so far. To understand this issue more deeply based on previous research, we consider it interesting to empirically study HPWS and its impact on financial performance in SMEs, and therefore, we assume that:
H1: HPWS have a positive effect on the financial performance of SMEs.

2.2 High-performance work systems (HPWS) and company`s reputation (CR)

The importance of reputation increases significantly in the current turbulent business environment when more than having a good technology or product alone is needed for success. A positive reputation becomes an effective weapon in the fight against the competition and, at the same time, affects the company's market value. Reputation is influenced by many factors inside the company, as well as in its external environment. It is difficult to assign any criteria of importance to them. Only their cooperation can bring a long-term positive reputation. In the past, reputation was part of marketing and marketing communication. Corporate reputation belongs to the corporate part of human resource management and is an integral part of corporate strategy (Liang-Chih et al., 2022). Reputation fundamentally affects the success of the organisation - customer trust, quality and commitment of employees, and the cooperation of partners and institutions.

Human resource management can give SMEs a competitive advantage. Still, they also found that customers can influence SMEs' decisions on whether or not to adopt new management practices. Customer satisfaction can significantly impact the decision-making of small and medium-sized enterprises regarding the adoption and implementation of HPWS. Customers are among the interested parties that significantly affect the company's reputation; therefore, interested parties, not only customers but also competitors, business partners or the public, can ultimately considerably influence the decision-making of small and medium-sized enterprises on the introduction and implementation of HPWS in the company to maintain good name, reputation. Let's look at HPWS from a different angle. It is an integrated human resource management system supporting higher quality human capital, primarily through employee development and their impact on the company's ability to attract talent. Businesses must attract, develop and retain talent to compete effectively. Through its procedures, such as selective recruitment or extensive training, HPWS contributes to the acquisition, development and retention of top experts in the company. The presence of high-quality human capital in the company contributes to building the company's reputation, which in turn attracts more clients. More clients mean more orders and sales, which positively affects the quantitative indicators of the company's performance. Therefore, we assume that:
H2: HPWS have a positive effect on building the reputation of the company.

2.3 Company`s reputation (CR) and financial performance (FP)

A better reputation ultimately leads to better company performance (Cazacu et al., 2023; Das et al., 2023). Therefore, the company's reputation is an intangible resource that is difficult for competitors to imitate and can be effectively transformed into an advantage that benefits the company's performance. Consequently, we assume that:
H3: Company reputation is positively associated with SME performance.
H4: Reputation mediates the relationship between HPWS and FP.

2.4 High-performance work systems (HPWS) and social value (SV)

Ensuring well-being at the workplace is one of the most critical social challenges in companies today due to its positive effects on employee motivation, achieving a good name (company reputation) and subsequently increasing the company's financial performance and social value. If small and medium-sized enterprises are to achieve this goal, they must introduce responsible human resource management in their organisations. Human resource management procedures alone are not a direct source of a company's competitive advantage. Instead, the advantage derives from the contributions of people selected, trained and developed through such practices. In particular, the human and social capital that HPWS creates provides businesses with the means to achieve superior competitive performance, financial performance, and growth in corporate social value (Messersmith & Guthrie, 2010). Therefore, we assume the following:
H5: HPWS positively affect the growth of the company's social value.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

2.5 Social value (SV) and financial performance (FP)

Quality is the most crucial variable in creating internal social value in small and medium-sized enterprises, directly related to improving the enterprise's financial performance. If we talk about creating external social value, Marinič (2016) found that customer satisfaction can positively enhance the company's performance. Daromes et al. (2023) demonstrated that a company's creation of social values is an opportunity to improve financial resources. Employees, consumers, and the company are increasingly sensitive to its social performance, level of social responsibility, and the formation of social value. Recent studies found that the ethical treatment of employees was the most crucial aspect of social value formation, and it greatly impacted employee commitment to the company and job satisfaction (Tyrrell, 2006; Cao et al., 2022). SMEs often form a single operating unit in a community with a predominantly local workforce. Therefore, their business position near the local community is crucial for small and medium-sized entrepreneurs. The responsible behaviour of SMEs in the business environment contributes positively to forming the company's social value, which should be reflected in the overall performance. For this reason, we believe that when SMEs work on their social value, it positively impacts financial performance. This leads to the following hypothesis:
H6: Social value positively affects the financial performance of small and medium-sized enterprises.
H7: Social value mediates the relationship between HPWS and FP.

3 Materials and method

Based on the above theory, a conceptual model (Fig. 1) was developed to assess the interrelationships between high-performance work systems (HPWS), SME reputation (RE), SME social value (SV) and SME financial performance (FP). The assumed relationships indicate the wording of the hypotheses.

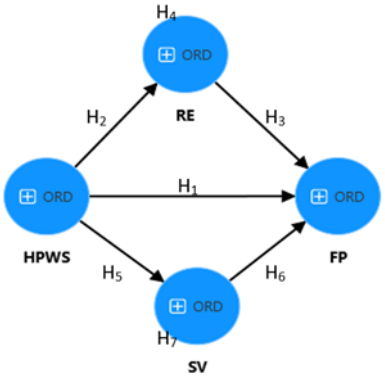


Figure 1. Conceptual framework (model)
Source: own elaboration

From a theoretical point of view, the model is referred to as a multiple mediation model (Hair, 2019). The article aims to quantify the outlined relationships, verify the formulated hypotheses and compare the results with published scientific outputs.

Data from a questionnaire survey was selected to evaluate the proposed conceptual model in this study. The questionnaire was implemented in 2023 and was part of the solution to a research task associated with research on the development of human resource management in SMEs in Slovakia. The operationalisation of the concepts was partly based on the research of Rubio-Andrés et al. (2022). The measurement tool used to operationalise the constructs of the theoretical framework was a multi-item measurement. The respondent rated each item using a "five-point" standardised Likert-type scale ranging from 1 to 5 (strongly disagree, disagree, neither agree nor disagree, agree, strongly agree). The investigated constructs were identified in a pilot study based on exploratory factor analysis. The sample size analysed was 128, corresponding to a return rate of 63%.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

Structural equation modelling with partial least squares SmartPLS 4 (Ringle, 2024) was used for quantitative data analysis. Due to its robustness, PLS-SEM is the preferred and widely used analysis method (Peng & Lai, 2012). There are several reasons for using PLS-SEM in this study. First, incremental characters are used (i.e., mediating the role of RE and SV between HPWS and FP and of SV). Other reasons are the study's predictive nature and the structural model's complexity, which has many constructs and indicators. A significant reason for applying the SEM-PLS method was the smaller sample size, the ordinal nature of the investigated variables, and the distribution function of the experimental data. The greater statistical power of the method means that PLS-SEM is more likely to identify significant relationships if they are present in the population (Sarstedt & Moi, 2019).

4. Results

The model, analysed in the SmartPLS 4, was based on the conceptual framework shown in Figure 1. The abbreviations explained in the theoretical part are used for the investigated constructs. The comprehensive evaluation model is shown in Figure 2, which identifies links between the constructs and the items that saturated the individual constructs.

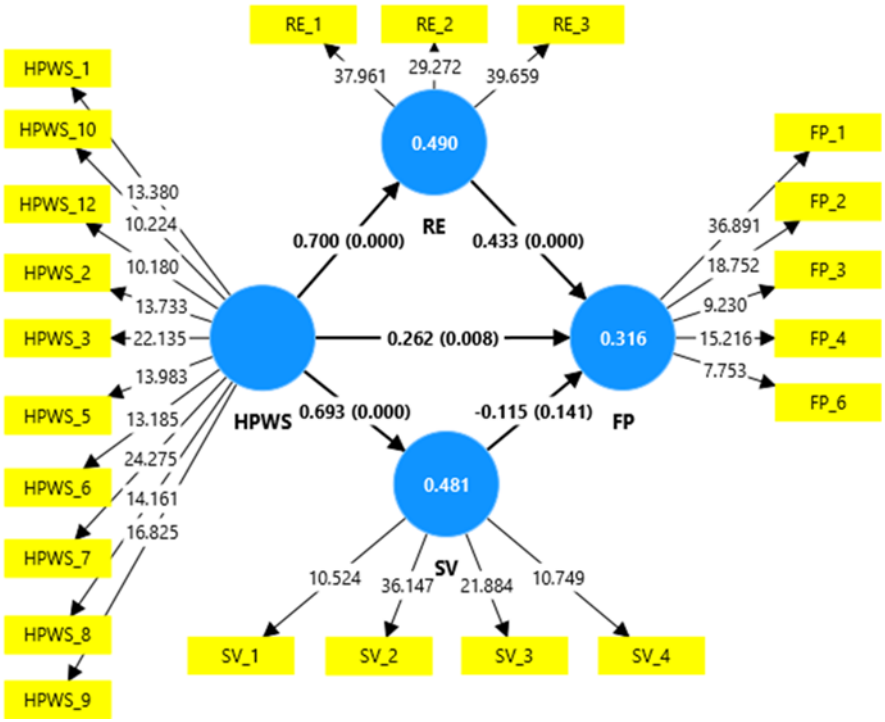


Figure 2. PLS-SEM results from bootstrapping
Source: own calculation

The analysis was carried out according to the procedures and recommendations given in the publications Hair (2019), Saersted et al. (2021), and Ringle et al. (2017). In the first step, the measurement model is evaluated. In the case of satisfactory results, the analysis of the internal structural model follows, followed by the prediction of the endogenous variable. Each step assesses the calculated values of individual criteria with threshold values . Bootstrapping is also recommended when evaluating the significance of individual computed measures. The model estimation uses the PLS-SEM algorithm, the path weighting scheme, a maximum of 300 iterations, a stop criterion of 10^{-7}, and an equal indicator weight for the initialisation. It was verified that after running, the algorithm converged, and the stop criterion was met.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

4.1 Assessment of the Measurement Reflective Model

From the point of view of operationalising the constructs by items, the nature of the constructs in the external model was adequate. The criteria for evaluating the measurement model differ for reflective and formative constructs. Examining the measurement model includes indicator reliability, internal consistency reliability, convergent validity (CV) and discriminant validity (DV). Indicator reliability is assessed using the values of the outer loadings and the AVE coefficient. Internal consistency reliability assesses the extent to which the items measure a specific latent construct. Composite reliability (ρ_C) was evaluated as a measure of internal consistency. The results, limit, and recommended values are shown in Table 1 below.

Table 1. PLS-SEM assessment results of reflective measurement models

		Convergent validity			**Internal consistency reliability**		
Latent variable	**Indicators**	Loadings > 0.70	Indicator reliability > 0.50	AVE > 0.50	Cronbach´s a 0.70 - 0.90	Reliability r_A > 0.70	Composite reliability r_C > 0.70
HPWS	HPWS_1	0.706	0.498	0.531	0.901	0.907	0.918
	HPWS_2	0.691	0.477				
	HPWS_3	0.807	0.651				
	HPWS_4	Item del.					
	HPWS_5	0.722	0.521				
	HPWS_6	0.689	0.475				
	HPWS_7	0.814	0.663				
	HPWS_8	0.739	0.546				
	HPWS_9	0.795	0.632				
	HPWS_10	0.636	0.404				
	HPWS_11	Item del.					
	HPWS_12	0.667	0.445				
RE	RE_1	0.898	0.806	0.786	0.864	0.867	0.917
	RE_2	0.869	0.755				
	RE_3	0.893	0.797				
SV	SV_1	0.702	0.493	0.606	0.778	0.788	0.859
	SV_2	0.877	0.769				
	SV_3	0.828	0.686				
	SV_4	0.690	0.476				
FP	FP_1	0.877	0.769	0.567	0.802	0.830	0.865
	FP_2	0.838	0.702				
	FP_3	0.645	0.416				
	FP_4	0.777	0.604				
	FP_5	Item del.					
	FP_6	0.585	0.342				

Source: own calculation

CV assessment requires checking the items' outer loading values and the average variance extracted (AVE). The recommended limit value for external loads is λ>0.708. This ensures that the construct explains more than 50% of the variance of the indicator. HPW_4, HPW_11, FP_5 were no longer included in the further analysis, as the external loads were very low (Hair, 2019). All other loads had a minimum value of around 0.7. The AVE value is calculated after removing these items. An acceptable AVE value is 0.50 or higher, which means that the construct explains at least 50 per cent of the variance of the items. The AVE for all constructs was found to be acceptable: HPWS (0.531), RE (0.786), SV (0.606), FP (0.567). This confirmed the convergent validity of the constructs. The last step in assessing the suitability of the measurement model is discriminant validity. Discriminant validity (DV) refers to the extent to which the constructs used in the model are distinct (Hair et

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

al., 2017). Three methods were applied to assess DV: Fornell and Larcker criterion, the Heterotait-Monotrait Ratio (HTMT) and cross-loadings of items. Fornell and Larcker's method compares the correlation between the constructs and the square root of AVE for that construct. To achieve DV, the square root of the AVE for each latent variable must exceed the correlation value of the same construct. The results are in Table 2.

Table 2. Fornell-Larcker criterion for assessing DV

	FP	HPWS	RE	SV
FP	**0.753**			
HPWS	0.486	**0.729**		
RE	0.535	0.700	**0.887**	
SV	0.376	0.693	0.714	0.778

Source: own calculation

It is apparent from the values in Table 2 that the square root value of AVE for a specific latent variable is higher than the correlation values provided in the rows and columns. Henseler et al. (2015) suggested using the heterotrait-monotrait criterion (HTMT), which is defined as the average value of item correlations across constructs relative to the average (geometric) correlations for items measuring the same construct. Values were obtained from the bootstrapping procedure with 1000 samples with percentile bootstrap confidence interval and one-tailed testing at the 0.05 significance level (Table 3).

Table 3. HTMT criterion for assessing DV

Path	Heterotrait-monotrait ratio (HTMT)
HPWS <-> FP	0.573 (UB_{95}: 0,702)
RE <-> FP	0.631 (UB_{95}: 0,747)
RE <-> HPWS	0.782 (UB_{95}: 0,872)
SV <-> FP	0.483 (UB_{95}: 0,628)
SV <-> HPWS	0.815 (UB_{95}: 0,899)
SV <-> RE	0.871 (UB_{95}: 0,943)

Source: own calculation

The problem with discriminant validity is present when the HTMT value is high (0.90 or in some cases 0.85). The value is significantly lower when assessing the influence of SV on FP (Table 4).

Table 4. Cross loading analysis

	FP	**HPWS**	**RE**	**SV**
FP_1	**0.877**	0.401	0.515	0.315
FP_2	**0.838**	0.302	0.469	0.230
FP_3	**0.645**	0.361	0.285	0.284
FP_4	**0.777**	0.436	0.378	0.343
FP_6	**0.585**	0.340	0.320	0.253
HPWS_1	0.422	**0.706**	0.593	0.632
HPWS_10	0.301	**0.636**	0.450	0.453
HPWS_12	0.344	**0.667**	0.512	0.436
HPWS_2	0.297	**0.691**	0.473	0.562
HPWS_3	0.462	**0.807**	0.563	0.540
HPWS_5	0.310	**0.722**	0.442	0.397
HPWS_6	0.275	**0.689**	0.395	0.349
HPWS_7	0.407	**0.814**	0.570	0.583
HPWS_8	0.342	**0.739**	0.454	0.448

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

HPWS_9	0.323	**0.795**	0.575	0.555
RE_1	0.478	0.581	**0.898**	0.609
RE_2	0.437	0.615	**0.869**	0.723
RE_3	0.504	0.662	**0.893**	0.574
SV_1	0.235	0.555	0.607	**0.702**
SV_2	0.337	0.586	0.643	**0.877**
SV_3	0.323	0.538	0.536	**0.828**
SV_4	0.269	0.471	0.419	**0.690**

Source: own calculation

The values from the table of cross-loadings point to the fact of acceptable discriminant validity. In conclusion, the overall results of the measurement model indicated adequate internal consistency reliability, convergent validity, and discriminant validity. Before assessing the structural model, multicollinearity must be checked in addition to validity and reliability. Multicollinearity can be evaluated through the variance inflation factor (VIF). Hair et al. (2014) recommend a maximum acceptable value of 3.0 for multicollinearity. The results of HPWS -> FP (VIF=2.306), RE -> FP (VIF=2.444) and SV -> FP (VIF=2.401) indicate that the problem of multicollinearity between latent constructs was not identified.

4.2 Evaluation of the structural model (internal model)

The structural model assesses the causal relationship between constructs using section coefficients. Using the bootstrap method with repeated selection is recommended when evaluating statistical significance. The measurement model is an accurate predictor of the formulated hypotheses. Assessment of the internal structural model involves examining the relevance of the model's projections and the connections between the constructs. Correlation between two variables (R^2), path coefficient (β) and T-statistic value, effect size (f^2), predictive relevance of the model (Q^2) and goodness-of-fit index (GOF) are essential standards for evaluating the internal structural model. The results of the evaluation of the structural model are in Table 5 below.

Table 5. Path coefficients of the structural model and significance testing results

Path	β	T statistics (|O/STDEV|)	p values	Significant (p<0.05)?
Direct effect				
H_1: HPWS -> FP	0.262	2.424	0.008	Yes
H_2: HPWS -> RE	0.700	11.975	0.000	Yes
H_5: HPWS -> SV	0.693	14.298	0.000	Yes
H_3: RE -> FP	0.433	3.620	0.000	Yes
H_6: SV -> FP	0.115	1.076	0.141	No
Indirect effect				
HPWS -> FP	0.224	2.666	0.004	Yes
Specific indirect effect				
H_7: HPWS -> SV -> FP	-0.080	1.057	0.145	No
H_4: HPWS -> RE -> FP	0.303	3.277	0.001	Yes

Source: own calculation

The statistical significance of the formulated hypotheses in the theoretical part of the study (H1 – H7) was assessed using section coefficients, i.e. the β value. For unit variability in the independent construct, the β symbol represented the predicted variability in the dependent construct(s). The higher the values of the β coefficient, the more significant the influence on the endogenous latent construct. The level of significance of the value is confirmed using the T statistic. The results in the first five rows assess the statistical significance of

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

the direct relationship between the investigated constructs. The causal effect of the SV construct on FP, which was identified as indirect and statistically insignificant, is problematic. The results in Table 5 identify complementary mediation types of relationship between HPWS -> FP. The indirect and direct effects are significant and point in the same direction. Cause-effect relationships in PLS path models imply that exogenous constructs directly affect endogenous constructs without any systematic influences of other variables. In many instances, however, this assumption does not hold, and including a third variable in the analysis can change our understanding of the nature of the model relationships. The mediating variables RE and SV mediate between the two related constructs HPWS and FP—change of the mediator variable, which, in turn, changes the endogenous construct. Analysing the strength of the mediator variable's relationships with the other constructs allows for substantiating the mechanisms underlying the cause-effect relationship between an exogenous and endogenous construct. Mediation using the SV variable is identified as a competitive mediation type. The mediating construct SV acts as a suppressor variable, substantially decreasing the magnitude of the total effect of HPWS on FP. The total indirect effect is the sum of the specific indirect effects. (0.199), which is a weak effect. In addition to the above criteria, the internal model was also assessed based on the coefficient of determination (R^2), effect size (f^2) and predictive relevance (Q^2) values. The coefficient of determination measures the general effect size and variance explained in the endogenous construct for the structural model, which also indicates the model's predictive power. An R^2 value > 0.75 is considered substantial, an R^2 value greater than 0.50 is considered moderate, and an R^2 value less than 0.26 is considered weak.

Table 6. Assessment of the internal model

	R^2	f^2	Effect size	VIF
HPWS -> FP	0.316	0.044		2.306
HPWS -> RE	0.490	0.961		1.000
HPWS -> SV	0.481	0.926		1.000
RE -> FP		0.112		2.444
SV -> FP		0.008	weak	2.401

Source: own calculation

As seen in Figure 2 and Table 6, the HPWS construct explains 49% (R^2=0.490) of the variability in RE, 48.1% of the variability in the SV construct (R^2=0.481), and 31.6% of the variability in the FP construct. The magnitude of the effect of each exogenous latent construct on the endogenous latent construct is represented by f^2. When the independent construct is removed from the path model and R^2 changes, the exogenous latent construct has a significant effect on the value of the endogenous latent construct. The recommended thresholds for f^2 are 0.35 for a high impact, 0.15 for a moderate effect, and 0.02 for a weak effect. In our case, a weak effect of the SV construct can be observed, but previous findings also suggest this.

Finally, the model's goodness of fit and predictive ability was assessed. The GoF (0.854), SRMR (0.084), Chi-square (566.721) and NFI (0.691) metrics are used to validate the overall structural model. The values of all calculated metrics indicate a good model fit Chen (2007). The predictive power of the estimated model was assessed using the Q^2 statistic, which is appropriate in a reflective measurement model. Q^2(FP)=0.214, Q^2(RE)=0.472, Q^2(SV)=0.463. Further proof is carried out by comparing the RMSE values. Subtraction results between RMSE on PLS-SEM and LM are negative. This indicates that PLS-SEM produces a more minor prediction error and vice versa. Two of the 12 endogenous construct items produce positive values, so most of the RMSE generated by PLS-SEM has a minor prediction error. So that conclusions can be drawn based on the PLSpredict estimation results, the proposed research model has good predictive power in the medium category.

5 Discussion

The empirical research has yielded interesting and novel findings. Based on the studies and literature search, a multiple mediation model was developed, which consisted of four constructs and proposed direct and mediating relationships between them. The quality of the proposed model was judged to be appropriate according to the criteria evaluated; therefore, the results can be interpreted. These conclusions partially correspond to the research results published in the study of Rubio-Andrés et al. (2021). Key targets construct financial

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

performance of SME (5 items) of SME on the right-hand side of the PLS path model, was examined as a latent variable, dependent on three variables: high-performance work systems (10 items), reputation (3 items) and social value (4 items). HPWS directly affects financial performance (HPWS -> FP; $\beta = 0.262$; $p < 0.01$). The effect size is moderate but statistically significant. Therefore, we do not reject hypothesis H_1. The largest, strong effect on financial performance is organisation reputation (RE -> FP; $\beta = 0.433$; $p < 0.000$); H_3 is not rejected. The value of the path coefficient of the relationship SV -> FP is negative ($\beta = -0.115$; $p > 0.05$); we reject hypothesis H_6. Two more causal relationships are evaluated with direct effect. The effect of HPWS ->Re is the strongest in the entire model considered ($\beta = 0.700$; $p < 0.000$). This result allows us to conclude that we accept H_2. A strong enough effect can also be observed between HPWS ->SV ($\beta = 0.693$; $p < 0.000$); thus, we do not reject hypothesis H_5 anyway. Since the model under consideration was designed as a multiple mediation model, proceeding to a comprehensive evaluation is still necessary. We arrived at interesting results when assessing the mediation effect of the construct's reputation and social value. The direct mediation effect of the reputation construct was statistically significant HPWS -> RE -> FP; ($\beta = 0.303$; $p < 0.01$). We do not reject hypothesis H_4. The hypothesised direct mediating relationship between HPWS -> SV -> FP was not identified, even though the value of the standardised regression coefficient was negative. Hence, we reject H_7. The predictive quality of the considered model was rated as a medium category based on the calculated criteria. In the context of the research conducted, the importance of the mediating role of the reputation of the SME-type organisation in improving the relationship between HPWS and financial performance needs to be emphasised. We illustrate how employee participation in decision-making, selective hiring, investment in training, lifelong learning, performance appraisal, equal pay and contingent pay enable SMEs to increase their economic growth. By introducing HPWS, workplaces are improved because greater motivation, reputation and transparency reduce employee absenteeism rates. The importance of the positive impact of reputation as a mediator on financial performance can be confirmed. This leads to a more remarkable ability to adapt to environmental changes, influencing better financial performance, namely higher growth and profitability. The mediating effect of reputation can be interpreted to mean that if SMEs improve their transparency and image, they will increase their financial performance. The results also highlight the indirect effect of the latent variable SV between HPWS and FV.

Given the need for research to analyse the impact of HPWS on FP in the context of SMEs in Slovakia, we confirmed the causal relationship between HPWS and FP and the presence of a mediator (RE) on the relationship between HPWS and FP. The data obtained from a questionnaire survey of owners/managers of SMEs in Slovakia strongly supports our research model. The results of this study reveal that HPWS is a significant predictor of FP, either directly or mediated through other factors.

6 Future research implications and limitations

The present study provides opportunities for future research but has several limitations. Respondents expressed their attitudes about the extent to which HPWS are implemented in their organisation. As such, several unobserved factors may influence this assessment of HPWS perceptions. Also, the contradictory results and the negative impact of the financial performance construct on the enterprise's social value must be addressed. The model could include new mediating variables, such as sustainable innovation, work well-being, and employee quality of life. As a limitation of the study, it should be emphasised that the empirical study study was conducted exclusively in Slovakia. Given the importance of SMEs across Europe, extending the analysis to a European scale would be interesting. Another limitation relates to using self-diagnosis questionnaires based on the opinions of entrepreneurs of their own companies. The information they provide could be subjective. Respondents from other stakeholders could also complement attitudes. The findings of this study have both theoretical and practical implications. The study contributes to the literature by providing empirical support for the mediating role of reputation in the relationship between particular practices in human resource management and firm financial performance. Theoretically, it provides a conceptual insight into analysing conventional approaches in quantifying the causal relationship between HRM and SME performance.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

7 Conclusions

Due to the significant contribution of small and medium-sized enterprises (SMEs) to the global economic system, human resource management, which has a consequent direct effect on the enterprise's financial performance, is currently the subject of theoretical study and practical solutions. In human resource management research, the PLS-SEM method allows complex models to be estimated and assessed while imposing relatively few constraints regarding data analysis. From the theoretical results, it is clear that owner-managers should focus their efforts in SMEs on applying HPWS in their organisations through selective selection processes. These include the identified aspects: workplace safety, employee involvement in decision-making, ensuring employee career development, participation in training, lifelong learning, feedback and performance appraisal, and awareness. These high-performing HR practices, based on good practice, create organisational reputation and social value. It is through them that the financial performance of the business is improved. Economic performance is critical to market competitiveness and is mediated by other factors. It is, therefore, logical for an organisation to have high-performance work systems in place, which ultimately lead to more motivated employees in the workplace, achieving greater transparency and reputation, as well as creating better products, more efficient processes and happier clients, which will undoubtedly lead to superior financial performance.

References

Auzzir, Z., Haigh, R., & Amaratunga, D. (2018). Impacts of Disaster to SMEs in Malaysia. *Procedia Engineering*, 212, 1131-1138. https://doi.org/10.1016/j.proeng.2018.01.146

Baeshen, Y., Soomro, Dr. Y., & Bhutto, M. (2021). Determinants of Green Innovation to Achieve Sustainable Business Performance: Evidence From SMEs. *Frontiers in Psychology*, 12. https://doi.org/10.3389/fpsyg.2021.767968

Das, K.P., Mukhopadhyay, S. & Suar, D. (2023). Enablers of workforce agility, firm performance, and corporate
Asia Pacific Management Review, 28(1), 33-44 https://doi.org/10.1016/j.apmrv.2022.01.006

Fiseha, G. G., & Oyelana, A. A. (2015). An Assessment of the Roles of Small and Medium Enterprises (SMEs) in the Local Economic Development (LED) in South Africa. *Journal of Economics*, 6(3), 280-290. https://doi.org/10.1080/09765239.2015.11917617

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2-24. https://doi.org/10.1108/EBR-112018-0203

Hair, J. F.. Sarstedt, M., Matthews, L., & Ringle. C.M. (2016). Identifying and treating unobserved heterogeneity with FIMIX-PLS: part I - method. *European Business Review*, 28(1), 6376. https://doi.org/10.1108/EBR-09-2015-0094

Henseler, J., Ringle, Ch., & Sarstedt, M. (2015). A New Criterion for Assessing Discriminant Validity in Variance-based Structural Equation Modeling. *Journal of the Academy of Marketing Science*, 43, 115-135. https://doi.org/10.1007/s11747-014-0403-8

Cazacu, M., Dumitriu, S., Georgescu, I., Berceanu, D., Simion, D., Varzaru, A.A., Bocean, C.G. (2023). A Perceptual Approach to the Impact of CSR on Organizational Financial Performance. *Behavioral Sciences*, 13(5), https://doi.org/10.3390/bs13050359

Cao, M., Zhao, S.M., Lv, HJ., & Wei, D.X. (2022). Can we have our cake and eat it too? Corporate social responsibility and employees' eudaimonic well-being and performance. *Business Ethics the Environment & Responsibility*, 31(4), 1040-1052. https://doi.org/10.1111/beer.12449

Chen, F. (2007). Sensitivity of Goodness of Fit Indexes to Lack of Measurement Invariance. *Structural Equation Modeling*. 14. 464-504. https://doi.org/10.1080/10705510701301834

Daromes, F.E., Ng, S., & Legaspi, K.P. (2023). oint Impact of Financial Performance and Corporate Social Responsibility on Firm Value: Does Legitimacy Matter. *Indonesian Journal of Sustainability Accounting and Management*, 7(1), 68-76. https://doi.org/10.28992/ijsam.v7i1.651

Kaushik, D., & Mukherjee, U. (2022). High-performance work system: a systematic review of literature. *International Journal of Organizational Analysis*, 30(6), 1624-1643. http://doi.org/10.1108/IJOA-07-2020-2282

Liang-Chih, H., Tzeng-Tian, H., & Chien-Bin, H. (2022). Companies to promote CSR impact on employees: High-performance work systems as a moderator. *Business Ethics the Environment & Responsibility*, 3(4). 999-1013. http://doi.org/10.1111/beer.12468

Marinič, P. (2016). Customer Satisfaction and Financial Performance. In Proceedings of 3rd International Multidisciplinary Scientific Conference on Social Sciences and Arts SGEM (pp. 229-236).

Messersmith, J. G., & Guthrie, J. P. (2010). High performance work systems in emergent organisations: Implications for firm performance. *Human Resource Management*, 49(2), 241-264. https://doi.org/10.1002/hrm.20342

Morán, J.J.O., Morán, B.E.O.., & Morán, A.S.O. (2024). Administrative Management System and its Impact on the Profitability of the Tecno Diesel Company during 2023, Quevedo Canton, Ecuador. *Estudios Del Desarrollo Social-Cuba Y America Latina*, 12(2), 442-456.

Naradda Gamage, S. K., Ekanayake, E. M. S., Abeyrathne, G., Prasanna, R., Jayasundara, J., & Rajapakshe, P. S. K. (2020). A Review of Global Challenges and Survival Strategies of Small and Medium Enterprises (SMEs). *Economies*, 8(4), Article 4. https://doi.org/10.3390/economies8040079

Ndiaye, N., Abdul Razak, L., Nagayev, R., & Ng, A. (2018). Demystifying small and medium enterprises' (SMEs) performance in emerging and developing economies. *Borsa Istanbul Review*, 18(4), 269-281. https://doi.org/10.1016/j.bir.2018.04.003

Peng, D. X., & Lai, F. (2012). Using partial least squares in operations management research: a practical guideline and summary of past research. *Journal of Operations Management*, 30(6), 467-480. https://doi.org/10.1016/j.jom.2012.06.002

Ringle, C. M., Wende, S., & Becker, J.-M. (2024). "SmartPLS 4." Bönningstedt: SmartPLS, https://www.smartpls.com

Ringle, Ch., Sarstedt, M., Mitchell, R., & Gudergan, S.. (2017). Partial Least Squares Structural Equation Modeling in Human Resource Management Research. *The International Journal of Human Resource Management*. https://doi.org/10.1080/09585192.2017.1416655

Rubio-Andrés, M., Ramos-González, M. & Sastre-Castillo, M.Á. (2022). Do High Performance Work Systems Improve Workplace Well-Being in SMES? Implications for Financial Performance. *Applied Research Quality Life*, 17, 1287-1309. https://doi.org/10.1007/s11482-021-09965-z

Sarstedt, M., Ringle, Ch., & Hair, J. (2021). Partial Least Squares Structural Equation Modeling. 10.1007/978-3-319-05542-8_15-2. https://doi.org/10.1007/978-3-319-05542-8_15-2

Sun, Y.Y., & Mamman, A. (2022). Adoption of high-performance work systems in small and medium-sized enterprises. Asia Pacific *Journal of Human Resources*, 60(3), 479-509. http://doi.org/10.1111/1744-7941.12277

Tyrrell, A. (2006). Corporate Social Responsibility: What is your opinion? *Accountancy Ireland*, 38 (1), 44-45.

Xiao, Q.J. & Cooke, F.L (2022). The joint impact of HRM attributions and HRM system consistency on employee well-being: a two-wave study. *Employee Relations*, 44(4), 926-947. https://doi.org/10.1108/ER-07-2021-0333

Funding: This research was funded by the Slovak Ministry of Education's Scientific grant agency VEGA 1/0718/22 Human resources development in small and medium-sized enterprises in the context of the 21st century challenges.

Author Contributions: Conceptualization: *Jašková, Kráľová, Sochuľáková*; methodology: *Jašková, Kráľová, Sochuľáková*; data analysis: *Jašková, Kráľová, Sochuľáková*, writing—original draft preparation: *Jašková, Kráľová, Sochuľáková*, writing; review and editing: *Jašková, Kráľová, Sochuľáková*; visualization: *Jašková, Kráľová, Sochuľáková*. All authors have read and agreed to the published version of the manuscript.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e5377654439

Dana JAŠKOVÁ is the assistant professor at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia.
ORCID ID: https://orcid.org/0000-0002-7250-9207

Katarína KRÁĽOVÁ is assistant professor at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia.
ORCID ID: https://orcid.org/0000-0001-5774-851X

Jana SOCHUĽÁKOVÁ is assistant professor at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia.
ORCID ID: https://orcid.org/0000-0003-2839-1296

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

Publisher
http://jssidoi.org/esc/home

ATTENTION AS A COMMODITY IN THE WORLD OF DISINFORMATION AND SOCIAL MEDIA*

Radoslav Ivančík [1], Pavel Nečas [2], Lucia Iľaščíková [3]

[1]Academy of the Police Force, Department of Informatics and Management, Sklabinská 1, Bratislava, Slovakia
[2]Matej Bel Univesity, Department of Security Studies, Kuzmányho 1, 974 01 Banská Bystrica, Slovakia
[3]University of Security Management in Košice, Slovakia

E-mails:[1] radoslav.ivancik@akademiapz.sk; [2] pavel.necas@umb.sk; [3] lucia.ilascikova@vsbm.sk

Received 11 July 2024; accepted 5 November 2024; published 30 December 2024

Abstract. The dynamic development of information and communication technologies, systems and devices, the emergence of new digital media and platforms, as well as the increasingly widespread use of social networks, on the one hand, increase the availability of information and expand the possibilities of searching, receiving, creating, modifying and sharing it, on the other hand, in a significant way increase the risk of spreading misleading, altered, distorted, deceptive and/or invented information, for example, in the form of disinformation. Given the fact that current business models and the ecosystem of advertising technology allow advertising to be tailored based on already known preferences and previous interactions of users, based on their profile, interests, activities, content they interact with, and even their interpersonal relationships, media, platform, social networks and advertisers try – to achieve the best possible economic results – to attract the sustainable attention of their users. Unfortunately, in many cases, it is also through the spread of disinformation. In this context, the authors, using relevant methods of scientific research, focused on attention as a commodity and the functioning of the attention economy in the context of the increasing extent of the spread of various disinformation (but also hoaxes and conspiracy theories) primarily through social networks, their susceptibility to the spread of unwanted content and efforts to regulate the spread of such content.

Keywords: attention; commodity; economy of attention; disinformation; social media; social networks

Reference to this paper should be made as follows: Ivančík, R., Nečas, P., Iľaščíková, L. 2024. Attention as a commodity in the world of disinformation and social media. *Entrepreneurship and Sustainability Issues*, 12(2), 176-192. http://doi.org/10.9770/k7393698996

JEL Classifications: F52, F59, H56, H59, K22

Additional disciplines: Security, Information

1. Introduction

Current business models and the ecosystem of advertising technology are characterised by the fact that, in contrast to surface advertising, such as that provided by television broadcasts, radio or print media, they allow to adapt advertising based on the already known preferences and previous interactions of users, based on their profile,

* *This work was supported by the Agency for the Support of Research and Development based on Contract no. APVV-20-0334.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

interests, activities and the content they interact with and even their interpersonal relationships. In addition to providing an opportunity for various forms of fraud, the advertising space also uses inauthentic information, such as pseudo-reviews of products and services, to increase their attractiveness or various automated methods of producing purposefully misleading information. An anonymous virtual environment further enhances their spread. The same happens with fake votes and signatures for multiple petitions on the Internet, public opinion polls or even illegal content. The rapid spread of such information in digital media, including social networks, elevates this space to extremely interesting and, from a business point of view, very lucrative.

At the same time, the use of emotional stories and situations is typical of this area, which is associated with the use of emotional language and the fact that the information provided is designed to attract attention and sound urgent. Nowadays, when attention has become an attractive commodity, it plays a relatively important role. It is evident that digital media in the advertising ecosystem benefit from the rapid spread of information (including false, misleading, distorted, altered or invented in the form of disinformation) in the online space, and consciously or unconsciously, they reward the spread of disinformation (Braun, 2019; Diaz Ruiz, 2023).

At the same time, it is confirmed that with the dynamic development of information and communication technologies, systems, devices, new media and the increasingly massive use of social networks and the constantly expanding possibilities of searching, receiving, creating, changing and sharing information, the risk of access to disinformation also increases. In this regard, Dholakia (2023, p. 5) says: *"In the age of information overload and profit-oriented media, the conditions for the growth of disinformation have been created for decades; social networks have only given these conditions a huge boost"*. In addition to the above, we would like to add that the publication and monetisation of information is never neutral, on the contrary, politics, the formation of opinions or prejudices, or even the spread of confusion can always be found behind it.

In view of the above, the authors of the article, using relevant methods of scientific research, focus on attention as a commodity and the economy of attention in the context of the increasing extent of the spread of various disinformation (but also hoaxes and conspiracy theories) through digital media, especially social networks, their susceptibility to spreading unwanted content, and also by trying to regulate the spread of such content. In close connection with this, they are also dealing with challenges that are constantly emerging in connection with the mentioned issue, and - given the dynamics of the development of new, modern digital technologies and the authorities' reactions so far - they will probably continue to emerge.

2. Attention economy in the era of disinformation

The Internet and social media have greatly changed and enhanced the way individuals, communities, and organisations seek, receive, create, modify, and share information. The digitally connected world has become a great swirling sea of information, often devoid of context (Ryan, 2020). Thanks to the rapid progress in technology and the development of new devices, the prevalence of disinformation increases every year. In proportion to this, concerns about their impact on individuals and society are growing. This is also one of the many reasons why more and more attention is paid to the issue of disinformation at the national and international levels.

Several different methods are used to spread disinformation. According to the World Economic Forum (2022), the key ones are mainly:

- social engineering, which provides a framework for the manipulation of events, incidents, issues and public debates and is often aimed at influencing public opinion in favour of a certain agenda;
- an inauthentic accent, where trolls, spamming tools, fake accounts, paid accounts and offering "sensations" play an important role;

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

- micro-targeting, consisting of the use of tools to identify and focus attention on specific groups of social media users, who are expected to have a high probability of sharing and further expanding the offered content;
- harassment and manipulation of the mobilised audience in an attempt to cover or marginalise other topics and opinions.

Quantifying and identifying the risk of spreading disinformation takes a lot of work. Significantly, if their definition exceeds several definitional frameworks and in this spirit, such type of information cannot be subjected to a simple dichotomous test - true/false. And also if the defining criterion of truth is a subjective attitude. In general, it can be said that currently, there is no single, unified and generally accepted definition of disinformation, and therefore, in the literature, we can come across a relatively large number of definitions that differ primarily by the industry or area of society in which disinformation occurs, or they are investigating. Despite their greater or lesser difference, the common feature of all used definitions is that disinformation is a deliberate modification of the information provided to influence, deceive or mislead the addressees of this information.

Some authors consider disinformation to be information that is (a) inaccurate, (b) uncertain, (c) vague (unclear) or (d) ambiguous (open to multiple interpretations) (Karlova & Fisher, 2013). Fallis (2014, p. 623) defines disinformation as "inaccurate, incomplete, or fabricated information that misleads people, whether as a result of inadvertent error, negligence, unconscious bias, or deliberate deception."According to Dušek and Kavan, two independent characteristics are attributed to disinformation: (a) it misleads and (b) the source benefits from it. However, it must be emphasised that the condition is not only that the information is misleading but that it is also primarily assumed that it will be misleading. This excludes, for example, improbable lies or intentionally false information that scientists and/or educators sometimes use as a research or education tool. In this work, we will primarily understand disinformation as information that misleads.

Typical disinformation techniques are characteristic not only of controversial content. They also appear, for example, if a topic is politicised, if they are used as a weapon in political competition, if there is an interest in instilling fear in society, or if it is a suitable tool to fulfil certain political, ideological or economic goals. In this work, we will focus primarily on the economic background of the dissemination of information that misleads its recipients and not only its source but also its spreader benefits from them.

We focus on this type of disinformation because standard business strategies, which are not primarily based on disinformation, do not exclude the possibility of using disinformation for purely economic reasons, which is usually invisible to the lay public. At the same time, as already mentioned, their creation and spread can disrupt certain social aspects, polarise society in political, health, financial issues or technological trends, and even shift political and economic power (Hajdúková, 2023). We could observe how false, invented, distorted, altered and erroneous information misleads people and influences public opinion, and what are the political and socio-economic consequences during the COVID-19 pandemic in connection with armed conflicts in the world or political rivalry in the national and international space. Disinformation directs people to motivated thinking or provokes unconscious bias. After all, politicians also usually make unrealistic promises to the people during election campaigns. Yet the media likes to spread them and misleading stories in various contexts, mainly for their shock value that attracts people's attention.

Spreading falsehoods and distorting facts is not a modern phenomenon. The twisting of historical events is known from oral tradition and can also be found in various historical manuscripts. However, today's modern technologies enable the spread of disinformation, conspiracy theories or hoaxes to such an extent and at such a speed that it is almost impossible to immediately identify and stop them (Hajdúková, 2023; Dušek & Kavan, 2024). This is also why they can cause intended and unintended damage, whether in political, economic or social relations, as well as to the health of people who believe in them. The scene is the media space formed on digital markets. They quite

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

naturally have different preferences for content creation and distribution. Regarding these preferences, their association with disinformation practices may be greater or lesser, depending on the type of business model of a specific media market.

Some websites, media or individuals on social networks attract more readers, listeners or viewers by knowingly (or not) promoting various false information. They benefit from their spread by attracting attention, and the growing interest in the medium, in turn, increases the price of advertising space (Hendricks & Vestergaard, 2019). Spreading controversial content, such as various conspiracy theories or hoaxes, is also a means used to maximise profits by attracting readers' attention, listeners or viewers. Many narratives deliberately try to evoke an emotional response in the reader, listener or viewer (regardless of the factual side of the story) because this increases the likelihood that people will be interested.

In addition, advertisers and advertising companies place their ads on websites directly or use specialised automated tools for this, so trying to maximise the potential of advertising income does not exclude that they will eventually become part of the financing of malicious content (various conspiracy theories, hoaxes and disinformation). The Global Disinformation Index (GDI) – a non-profit organisation that attempts to identify disinformation through content and message context analysis – continuously updates the list of websites that publish disinformation. The list also serves entities using online advertising and platforms as an opportunity to avoid spreading potentially controversial content in the form of various disinformation, conspiracy theories and hoaxes. For example, the label "good brand" is a valuable asset, meaning that its association with such harmful or controversial content, even if unintentional, can damage the brand's reputation and ultimately reduce its market value. The GDI reports that at least $235 million in revenue is generated annually from advertising on disinformation and conspiracy websites, partly powered by well-known companies in all sectors (GDI, 2019).

According to Wajeeha et al. (2023), advertisers using digital advertising platforms are about 10 times more likely to appear on websites with disinformation than those who do not use this mechanism, especially if it is a programmed advertisement based on automated mechanisms. The difference from non-automated forms, where the advertiser has control over where his ad is displayed, lies in the fact that the possibility of control is absent in this case. Thus, online advertising revenue still contributes significantly to the funding of disinformation and conspiracy websites, or when they are unwittingly placed alongside disinformation content.

In the case of social media platforms, whether we realise it or not, they "collect" the tastes and interests of their users and tailor advertising and adaptive content to them. They also allow disinformation sites to earn money through placed advertising. We view disinformation in this context as the product of a carefully planned and technically sophisticated process of deception (Fallis, 2009) by attracting attention and monetising it. In other words, new highly interactive media allow media platforms to rely on monetising attention or monetising user interactions and attention by using the collected information to target ads to each user. According to Statista.com (2024), global advertising spending has been growing steadily since 2010, with the Internet considered the most important medium for advertisers from 2022. The portal also reports that global digital advertising spending reached over 601 billion US dollars in 2023. Their continuous growth is also expected in the following years (Figure 1).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

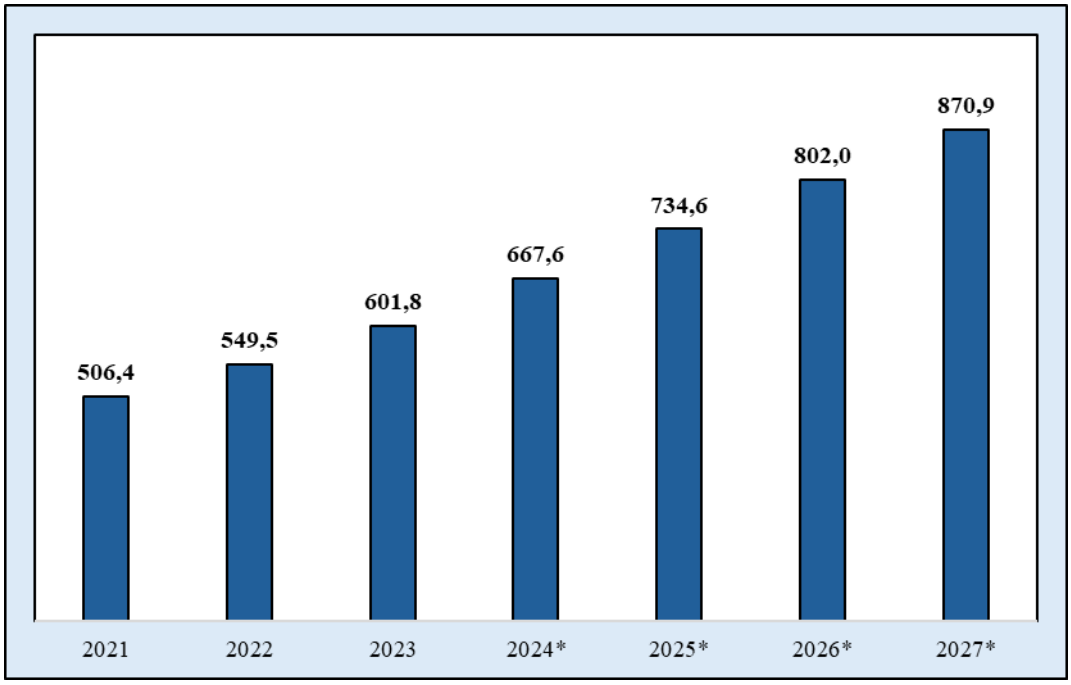


Fig. 1. Digital advertising spending worldwide from 2021 to 2027 (in bil. USD)
Source: Statista (2024)

Note: The stated expenditures on digital advertising in the years 2021 to 2023 are real, in the years 2024 to 2027 estimated

3. "Attention" in the centre of attention

It is undeniable that media habits have changed in a relatively short time. Continuously improved technologies and devices, increasingly accessible and faster Internet connections, the growth of the number of social networks and their platforms, as well as the dynamic growth of users, together with the steadily growing content intended for "consumption" and the fact that the income of many technology companies is primarily based on advertising and data collection means that these companies - to maximise profits - can ensure continuous engagement and growth of users by having websites, applications and platforms specially designed using certain psychological principles to support and reinforce this engagement continuously (Dwivedi et al., 2021). The economy of attention is openly discussed in this context.

Although this term is relatively young, it already appears in terminological dictionaries. For example, Collins Dictionary (2024) defines the attention economy as “an economic system in which sellers of goods and services must compete to attract the attention of potential consumers”. The Political Dictionary (2024) states that “the attention economy is a term that refers to a range of economic activities based on the belief that people's attention is a scarce and highly desirable resource to be captured and held. In the attention economy, attention is primarily about user engagement with digital products, which equates to revenue and influence for those who capture and maintain it” (Politics Dictionary, 2024).

McCann (2024) says that the "attention economy" describes the business model of companies that generally offer their goods or services for free but profit from selling user data - obtained from attention - to third parties and advertisers. Traditionally, this business model was used for television, radio and newspapers. However, on the Internet, it has become the default for major social media sites like Facebook, YouTube, LinkedIn, Twitter (X.com), TikTok, and more.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

With the rise of content creation presented on the Internet and social networks, the concept of the attention economy is being taken more and more seriously. It is indisputable that attention given to one thing eliminates the mental capacity for the ability to pay attention to another thing. When it comes to receiving / consuming information, the individual's attention is a limiting factor and limited or, in economic terminology, a "scarce resource". This is because the total available attention is limited by the number of people who have access to the information, by time, which is defined by a fixed number of hours of the day, and by the individual's ability to maintain attention over time. From the point of view of economic theory, attention is thus a rare resource that is in demand on the market, and with its lack, its price increases (Davenport & Beck, 2001).

The demand for attention and the dynamics of the attention economy encourages content providers to seek ways in a competitive environment to attract the attention of the broadest possible range of users to their product, so that these users spend as much time as possible "consuming" this product. And also by sharing content on pages, in applications, etc. Marketing, in this case, is built on two steps: (1) it must interest or entertain a person to get their attention, and (2) it must then offer advertising content. The correct estimation of the suitability of the potential content and the potential of the chosen medium is, therefore, crucial (McCann, 2024).

The concept of the attention economy, which works with human attention as a scarce commodity, is attributed to the American economist, political scientist and cognitive psychologist Herbert Alexander Simon, who explained in his 1971 article how the laws of supply and demand govern information and attention (Simon, 1971; Hyland, 2023).

Every change in doing business disrupts the competitive environment and often brings inequality of opportunities and unfair practices. The spread of digitised activities and processes into a wide range of business areas thus indicates new, potential problems in law enforcement, especially regarding cross-border business. Although the digital economy opens up new business opportunities, it also brings structural, financial and legal issues. The dynamics of the development of economic processes usually outstrips the dynamics of legal regulation. According to the World Bank, digital platforms are one of the six pillars of the digital economy, as they offer products and services available through digital channels such as mobile devices, computers and the Internet for all aspects of life (World Bank, 2024). Both public and private entities are intermediaries between one or more parties to a business relationship. The potential of the information obtained thanks to the digitalisation of the economy, as well as the tools that can not only concentrate it but also analyse it, represents a new type of asset with an unimaginable value.

The fact that different types of media and information and communication channels struggle to keep users' attention is probably something users are aware of, as well as the fact that they often spend more time with them than is necessary and healthy. They need to learn more about the real reason and the financial incentives behind attracting attention. They do not think about the standard economic premise that the market value of anything is determined by what someone is willing to pay. In this sense, users' attention must be understood as a valuable commodity (Davenport-Beck, 2001).

The fact that some digital products are presented as "free" to users does not ultimately represent any form of altruism on the part of the providers of these products. These are paid by consumers through their consumption because attention affects the price of advertising space. The price the user pays can be the service he receives, "laced" with advertisements paid for by advertisers. The possibility of avoiding such distractions naturally exists. For example, the user pays for the service without advertising. From this, it is clear that the product makes money under all circumstances, either through paying advertisers or users, regardless of whether they know it. The provider's challenge is just to attract more attention.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

The attractiveness of headlines and design, as well as the deliberate division of the text into several pages and keeping users in suspense, is naturally linked to increased attention, which, according to psychologists, can be addictive but also increasingly urgent from the point of view of commercial companies or individuals who offer content, because it is a revenue-generating tool for them. This is one of the main reasons they are open to any practices to keep the attention of consumers/users.

Another aspect that motivates to maintain attention is the knowledge that the media, especially social networks, is a lucrative space for mining personal data, which is crucial for effective marketing strategies and advertising targeting. According to Nixon (2020, p. 75), *"Attention is a central object of control and a source of value, and the ability to control the conditions of news consumption makes it possible to gain power over attention and treat news attention as exploitable audience work. The ability to "manage" attention thus implies not only power over consumption but also power over part of the process by which audience members create meanings from the meanings they consume"*.

According to Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/ The EC (General Data Protection Regulation), the Charter of Fundamental Rights of the European Union, as well as the Treaty on the Functioning of the European Union include the protection of natural persons in connection with the processing of personal data among basic human rights. Personal data of users, provided by the use of social networks, online purchases, or simply by saving them in the Internet browsing history (name, residence, phone number, e-mail address, education, occupation, interests, habits, photos, etc.), but also numbers bank accounts and means of payment should be subject to protection according to the approved rules. Therefore, we confirm the terms of use by default when providing them. The risk is if we do not study the conditions sufficiently and consent to data use. As has long been speculated, this data may be sold to third parties for marketing purposes and may also be misused by third parties due to insufficient protection. A typical example of this is the Cambridge Analytica case, where Facebook user data was used to formulate an algorithm to understand users' personality traits and then used in the pre-election presidential campaign to influence voters (Confessore, 2018).

To generate revenue from news "consumers" or advertisers, the competition to keep customers' attention is increasingly fierce in an information-saturated environment. Therefore, it is reasonable to question whether there is a risk that disinformation is included among the means of attracting and maintaining attention in such a competitive struggle. And vice versa, whether disinformation websites and/or offered disinformation content cannot be understood as a suitable carrier for advertising, which is one of the primary sources of income in the digitalised economy (Brynjolfsson & Oh, 2012).

Depending on the context, the effects of the attention economy are different. We perceive the management of our attention differently if we want to make more efficient use of our mental abilities in connection with our own productivity or to maintain the right balance between work and private life, which is different in the business world. In the following sub-chapter, we, therefore, address the different contexts of disinformation dissemination in connection with the activities of content producers and marketers in a digitalised environment, where the attention economy is a competitive environment in which economic entities compete for the largest possible share of consumers and do not hesitate to use disinformation as a means of attracting attention. The motive does not have to be financial profit but various other forms of benefit.

4. Different contexts for spreading disinformation

Today's knowledge indicates that the distribution of false, misleading, distorted or altered news in disinformation is strongly linked to many aspects, including the already mentioned social, cultural and historical ones. These can

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

affect the perception and use of information in society in general. And precisely because inaccurate, misleading, distorted or altered information may have some characteristics in common with correct information, it is not easy to detect the nature and intent of such misuse. In general, however, it can be a social or personal benefit. The authenticity of the received content, the ability to perceive it in a broader context, the way the language is used, the emphasis or omission of certain facts, the reliability of the information spreader and the possibility of his interest in a specific agenda, these are a whole range of factors that need to be aware of in this issue.

Attention management is becoming more and more important on a social level. It helps people deal with the massive number of events and the amount of content they encounter daily as efficiently as possible. On the other hand, the media, even the mainstream ones, largely depend on viewership, which is – as mentioned above – a determining element of the price of advertising space. These media compete for viewers, listeners or readers (Frislich et al., 2023). Viewership as a parameter of media success, therefore, often stands and falls on the content offered. In this case, users of news/information rely on the fact that the content provided is correct. It is assumed that all the information offered by these media has gone through internal verification processes, that they are under the scrutiny of the authorities, and that these media vouch for the truth and accuracy of the information they publish.

Nevertheless, in political programs and talk shows, we often witness that the media cannot guarantee the objectivity of what they present in many cases. Unfortunately, it is not an exception that their representatives, who are expected to be impartial, are directly involved in political arguments or do not hide personal bias for a reason that can only be deduced. Also, how they grasp and present the topic plays a significant role in the attention economy (Yuting et al., 2020). Show trailers are a clear example of this.

Conducted surveys indicate that the most watched programs are those that broadcast sensational content and, at the same time, tend to rely on journalistic commentary. This means that they often prefer personal opinions to the actual disclosure of facts, naturally creating space for spreading attractive but inaccurate, incomplete or misleading information. Since these were mostly programs broadcast in prime time, one of the motivations was likely an effort to gain users' attention. This action may have intent, not ignorance (GDI, 2022).

The topics that have been dividing society for the last decades, thus giving space to the spread of various disinformation (as well as conspiracy theories and hoaxes), were and are mainly uncontrolled migration, health crises, armed conflicts and undoubtedly political rivalry. In this context, internet platforms and social networks play a key role in how people's opinions on these topics are formed and how they are commonly expressed and discussed.

The last two decades have been significantly marked by waves of irregular migration, which is why many misleading, distorted and hostile narratives have appeared on the Internet and social networks regarding it, presenting it as a threat to partially overlapping areas, which are: (a) health (migrants as disease carriers), (b) wealth (migrants as welfare cheats abusing the social system, or unfair competition in the labour market), and (c) identity (migrants as a hostile invading force, threatening to replace white Christian Europeans and their traditions) (Butcher & Neidhardt, 2020, p. 5).

Whether it's xenophobic discourses or the authors' reasonable concerns and frustrations, it's content that often doesn't delineate or even blurs the lines between fear and perceived threat, undoubtedly attracting much attention. Naturally, the mixing of cultures can also bring with it the mentioned risks, and they must be included, just as it is not correct to generalise them. Two groups stand against each other - opinion-forming media and alternative media, which compete for attention and, often without real arguments, create pressure on public opinion (Happer & Philo, 2013).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

Another of the topics that are recorded in the media in the fight for attention are various health crises, such as, for example, epidemics of cholera, bird flu, swine flu, Ebola, dengue fever or the coronavirus pandemic. The situation that arose in connection with the SARS-Cov-2 pandemic causing the disease COVID-19 strengthened and even accelerated the development of modern technologies and the use of various online services. On the one hand, it brought new possibilities for economic models; on the other hand, it created new and strengthened existing threats, often of a hybrid nature (Juhász & Szicherle, 2017). During the period of the pandemic, not only was various disinformation spread on the Internet and social networks denying the disease itself, its origin, the way it spreads and the need for vaccination to protect public health, but also emotionally exposed speeches and images of vaccination advocates. The influence of coercion and hysteria supported by the media, as well as the countless amount of disinformation that accompanied this period, was manifested in the lower vaccination rate of the population and in the a priori resistance to the measures taken to protect public health. We have even witnessed aggression, verbal and physical attacks directed at representatives of state power, health workers, police officers, members of testing and vaccination teams, etc., regardless of their personal involvement. In a pluralistic society, one would expect space for plurality on both sides of the media spectrum. Still, their sharpness and the replacement of pragmatic debates with emotional outputs evoke media competition for Attention (Liu et al., 2024).

Armed conflicts are undoubtedly a breeding ground for the creation and spread of disinformation. The lack of transparency, inaccessibility, and especially the frequent impossibility of verifying some information are great opportunities for all parties involved in the conflict. According to the current development of the conflict, it is possible to evoke sympathy or sway the public to one's side, appeal to foreign countries to obtain financial and material support, etc. Often, even after years, it takes work to prove one of the parties to the conflict to be correct and to prove the plausibility of the content presented and accepted by the warring parties. Our goal in the article is not to evaluate past or current conflicts but to point out the fact that the media, in the competitive struggle to gain the attention of the consumer, often expose the offered content with inadequate, bombastic narratives in an attempt to attract attention, regardless of the effort to find out the truth or at least warn, that the information is not verified (Harper et al., 2021).

Free and fair elections are one of the basic building blocks of democracy, which presupposes the independence and transparency of the electoral process. However, digital tools have now significantly blurred the line between real information and political campaigning and opened imaginary doors for new intrusive and opaque targeting and amplification techniques that influence voters in a hidden way. Some manipulate them (Hajdúková, 2023). According to the European Commission, such techniques limit the plurality of opinions, fragment the democratic debate and naturally increase the risk of manipulation. And this is also thanks to the spectrum of new actors who play an essential role in political campaigns. From online platforms and social media to data processing companies (European Commission, 2021).

A typical example is the case surrounding the company Cambridge Analytica, revealed in 2015, which used data on 50 million users, which it obtained from Facebook users for a purpose other than the declared one, to create personality profiles of individual users, and then, without the users' consent, sold it. Subsequently, they could be targeted to influence voters in the American election campaign. On the other hand, to gain the attention of their users, the media sometimes bring fictions of electoral fraud or feature documentaries, as was the case, for example, in connection with the lost American presidential elections in 2020. In doing so, they support, to a certain extent, the trend towards "controlling" the electoral behaviour of other people (Bond, 2023).

Social divisiveness and inciting mistrust towards institutions are breeding grounds for similar manipulations of information and the spread of disinformation, as well as direct influencing of election campaigns or lobbying, which naturally undermines citizens' trust in the integrity of elections and their results. This is also indicated by a recent Eurobarometer survey, which showed that 81% of respondents in the EU believe that foreign interference

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

in our democratic systems is a severe problem that needs to be tackled. Regarding general attitudes to electoral issues, 78% of respondents fear that disinformation will influence voters' decisions, 72% fear manipulation of elections through cyber-attacks, and approximately the same number of respondents (70%) also fear covert influence on elections by other countries (European Commission, 2024).

The fact that micromarketing and disinformation have become a common political strategy and cases of direct or indirect foreign interference in elections are part of the political struggle is also documented by the so-called Mueller's report on the investigation of Russian interference in the 2016 US presidential election (U.S. Department of Justice, 2019), or the public version of the report on foreign threats to the 2020 US federal election (National Intelligence Council, 2021) and many others. The results achieved by targeted political micromarketing could also be observed in the referendum on withdrawing the United Kingdom from the European Union, even with the generous help of incorrect and misleading information.

Opportunities to achieve political, economic or other advantages through the manipulation of the information space by foreign state and non-state entities are thus already part of geopolitical competition. News of information manipulation and foreign interference in elections often dominate political debates before and after elections. Unfortunately, they are often presented by the media even without real evidence. In the same way, published political preferences during election campaigns do not always correspond to reality and can also be influenced to a certain extent by the narrative accompanying the political party, its program, or persons associated with it. The more media space a competitor must influence voters, the higher the probability of winning them over. And this, even though it is often meaningless or false information, is used to manipulate public opinion. Therefore, "powerful stories", "guaranteed information about a political opponent", and emotional performances play an essential role in the attention economy (Schleffer & Miller, 2021). In this case, not primarily financial profit but political profit are at stake. However, it is also a tool for attracting attention and making the medium more attractive.

Incomplete, altered or distorted information, exaggeration, emotional manipulation, arguing with statistics that do not exist or are already old but "convenient" data, denial of certain facts, fabrications, selective reporting or even conspiracy theories, all of this is part of election campaigns, but also of contemporary political life. Suppose someone presents data, fancy diagrams or graphs, or uses numbers to illustrate the topic. In that case, he usually gets attention and is convincing, even when the information presented is not true or is only partially true. Likewise, simplified data visualisation helps people automatically – without understanding the problem – assume the truth of the presented information and pay attention to it without subjecting the received information to critical analysis or verifying its truth (Soprano et al., 2024).

According to Lewandowsky et al. (2020), disinformation is often accompanied by the "illusory truth effect". This means that the more people are exposed to certain disinformation that no one disputes, the more it appears to be true, despite doubts about the source of the information. Repeated exposure to such misinformation eventually leads them to believe the claims. In this context, the question arises as to why the media usually does not distance itself from content that already raises doubts or outrage at first glance but instead shares controversial content. Is there an economic profit behind such an attention-getting approach?

The presence of intent to disseminate incomplete, misleading, distorted, altered or outright false information in real-time communications is usually difficult to identify. This is one of the reasons why any information, including disinformation, can subsequently spread further. And often even without the spreader himself believing them. Usually, content sharing is associated with expressing belonging to a certain community, nationality, political belief, sympathising with entities, or as a result of a certain social pressure, or there is a simple conformity behind it (Molina et al., 2021).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

5. Initiatives against the spread of disinformation

The need to learn more about the possibilities of disinformation detection and interventions on social networks is increasingly emphasised, especially in relation to companies such as Alphabet (Google), Meta (Facebook) and others. They are expected to actively assist researchers in understanding how these social networks filter information. Scientific cooperation has challenges from the point of view of industry and from the point of view of the academic community. However, there is an ethical and social responsibility that goes beyond market forces for social networks to contribute this unique data to the investigation of processes that support clearing misinformation (GDI, 2020).

Although no specific public authority in the European Union would decide what is considered disinformation and what is not, even demonstrable disinformation is usually not directly sanctionable (financially, criminally), some initiatives to eliminate it are gradually emerging. The action plan of the European Union in the fight against disinformation (European Commission, 2018) brought guidelines for the duties and responsibilities of online platforms in the fight against disinformation. It continued with other formal and informal initiatives in this area.

The European Union also expressed its position in the Code of Practice on Disinformation (European Commission, 2022). It was the first ever instrument of its kind, which is already part of a wider regulatory framework. The Code contains 44 commitments and more than a hundred specific measures in areas such as the transparency of political advertising, the integrity of digital platforms in eliminating manipulative behaviour and misleading practices, as well as empowering users of digital services and protecting them from disinformation, as well as empowering fact-checkers and facilitating researchers' access to data in order to carry out meaningful analyses about what is happening on digital platforms. At the same time, the Code declares an effort to demonetise the spread of disinformation, i.e. an effort to eliminate financial incentives for providers of disinformation, or to ensure that advertising is prevented from being placed next to disinformation, or that advertising containing disinformation is prevented. More specifically, the appeal for adherence to the code is an effort to:

- guarantee the transparency of political advertising, that is, the proposed rules are intended to ensure the transparency of political advertising services that are provided for a fee. In principle, it is about not concealing and distorting key information, for example about financial sources and the way politicians and political entities are financed, such as the name of the advertiser, real amounts spent on political advertising, etc.;
- empower users with the aim of eliminating the use of certain targeting, amplification and optimisation techniques that are currently abused to target advertising based on the collected personal data and profile behaviour of users, which subsequently allow advertising to be tailored specifically to specific individuals or groups, mostly without their knowledge;
- improve cooperation with fact-checkers, whose task is to regularly publish impartial reports on the accuracy or inaccuracy of statements by public officials, essential institutions and other generally disseminated statements that are relevant to the company;
- facilitate the access of researchers to the data of online platforms for the purpose of analysing facts and evidence about the spread of disinformation, for the purpose of monitoring techniques and tools that are constantly changing, and for the purpose of sharing such knowledge with public authorities and the public;
- ensure the integrity of the services provided by the platforms by implementing and supporting guarantees against a list of manipulative behaviours and practices that are not allowed within their services.

The Code is supplemented by legislation on the transparency and targeting of political advertising and Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC, informally called “Digital Services Act” (DSA), hand in hand with the so-called by the "Digital Market Act" (DMA) amended by Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828. They thus form a uniform set of rules for the so-called gatekeepers - large digital platforms - that apply throughout the European Union. The rules specified in the DSA concern primarily online intermediaries and platforms (online marketplaces, social networks, content sharing platforms, application stores and online platforms for travel and accommodation), respectively providers of certain services defined in the European Parliament and Council Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services, which establishes the procedure when providing information in the field of technical regulations and rules relating to information society services, which are normally provided for a fee, remotely, electronically and based on the recipient's request. The goal was to harmonise the rules, deal more effectively with the spread of illegal content on the Internet, and eliminate social risks that can result from the spread of disinformation. Thanks to the DMA, in the future, gatekeeper platforms will only be allowed, among other things, to track end users for targeted advertising with effective consent outside of the platform's core service.

The complete elimination of undesirable information types is naturally impossible in a liberal democratic society. In this context, however, it is very important to realise that the information's origin and the disseminators' identity are not so decisive as the message they spread. Therefore, the future of disinformation depends on the social responsibility of all media actors and their self-regulatory systems, including respect for the principles of best practices, and naturally also on individuals. A big challenge in the coming years will be effective and efficient education in media and information literacy, immanent critical thinking, and responsibility for verifying facts.

In addition, it should be noted that what is considered disinformation in the European Union is not decided by public authorities, and disinformation is also not directly sanctionable according to the above-mentioned regulations, nor is it sanctionable through other secondary legislation. It is related, among other things, to the terminological and content inconsistency, which was already mentioned at the beginning of the article. So far, the fight against disinformation has also relied heavily on the voluntary cooperation of platforms in terms of immediate action, for example against "illegal content". However, the legislation does not impose a general obligation on them to monitor the information that these providers transmit or store, or even an obligation to detect facts or circumstances indicating illegal activity proactively. On the contrary, there is room for platforms to refuse to comply with the orders of European or national authorities if they believe that they conflict with the fundamental rights to freedom of expression and information based on the Charter of Fundamental Rights of the European Union (EUFRA, 2007, Article 11).

The task of creating a unified taxonomy has been undertaken by several private organisations, such as the Global Alliance for Responsible Media (GARM), which brings together marketers, media agencies, media platforms, industry associations and ad technology solution providers, as well as other organisations whose the concern is to protect digital media from harmful online content and its monetisation. This means protecting against content that is not suitable for any advertising support. This includes insensitive, irresponsible and detrimental handling of debated social issues that incite conflict and verifiably false or deliberately misleading content. The goal is to create a shared understanding of what constitutes harmful and sensitive content through individual categories, determine minimum safety limits for the placement of a promoted brand ad, and identify the different levels of brand risk associated with certain content. Monitoring consists of answers to

- how safe the platform is for consumers (the number of views of malicious content as a percentage of all views);
- how safe is the platform for advertisers (number of ad impressions on harmful content as a percentage of all ad impressions);
- how effective the platform is in enforcing its security policy (total number of malicious content pieces removed and number of views);

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

- how prompt is the platform in correcting errors (number of user appeals and number of restorations performed by platforms (VFA, 2022).

Instructions on how to prevent companies from losing their reputation by publishing their advertising on sites with undesirable content have also been taken up by various civic initiatives. For example, in Slovakia, one of the most famous is the Konspiratori.sk website, which publishes a database of websites containing at least one of the specified criteria for the content offered, such as:

- the materials have a fraudulent and charlatan character (miracle treatment, magic preparations, etc.), where "the criterion is a contradiction with objective, scientific knowledge";
- misleading, disinformation messages and false propaganda (statements that contradict the facts, audio and video content used in a different, misleading context, possibly invented or seriously distorted events) except presented opinion articles;
- conspiracy theories and "delusions", if it is assumed that they could have more serious political, economic, and health consequences, with the exception of interesting things, mysteries, and clearly marked speculations;
- profanity, calls to violence, extremist content, spreading alarmist messages, aggressive personal attacks, defamation of minorities, races, nationalities, religious groups, etc.;
- non-respect of the basic principles of journalistic ethics (not publishing corrective reports, not removing, or not including in reports that objectively proved to be false,
- the website does not have a clear owner and authors (except for the protection of sources and pseudonyms), does not publish possible reactions of the affected party, rudely mixes news and comments, repeatedly publishes shocking false claims in order to increase traffic, which it later corrects, etc. (Konšpirátori, 2024).

Conclusions

The dissemination of false, misleading, distorted, altered or fabricated information is supported by three key mechanisms, among others. These are advertising, virality and automation. It can have a range of harmful consequences, starting from disrupting the functioning of a democratic society and threatening democratic principles through increasing the polarisation of society, endangering health, damaging the environment, damaging the brand's reputation and decreasing its value, to supporting radicalism, extremism, populism, xenophobia and total breach of company security. Therefore, efforts to eliminate such consequences appear naturally at the national and transnational levels.

Initiatives to strengthen the fight against disinformation spread today, mainly via the Internet and social networks, are aimed both at inducing a multidisciplinary public discourse about the reasons that led to the decline of public trust in information from official sources and on the one hand at finding ways to disinformation (but also conspiracy theories or hoaxes) to face. At the international level, for example, the OECD (2022) formulated best practice principles for this area: transparency, inclusiveness, society-wide cooperation guided by public interest, institutionalisation, provability, timeliness, prevention, and future and professionalisation.

While at the national level, countries are taking some useful steps, starting from legislative changes through digital and media literacy programs, to research into the phenomenon of disinformation with the participation of journalists and civil society, some of the efforts, even if they represent a legitimate public interest purpose, raise legitimate concerns about restrictions on freedom of expression and violations of human rights. In addition, there are also concerns that some governments could use the issue of disinformation as a pretext to impose unreasonable restrictions on press freedom (INCL, 2022).

In this context, one of the key elements of the anti-disinformation policy will probably be not only understanding the dynamics and demonetisation of disinformation but also ensuring that the policy of combating disinformation does not become a pretext for intimidating critical voices, defaming opponents, justifying censorship and a threat

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/k7393698996

to civil discourse and electoral processes. A complicating factor is the application of the rights to information and freedom of expression on the one hand, and the application of objective but adequate metrics for reliable identification and subsequent adoption of measures to eliminate the creation and dissemination of misleading, distorting, altered and/or manipulated information on the other.

Finally, one of the great challenges of the 21st century will also be redefining the nature and functioning of welfare states in the context of the problems brought about by digitisation and artificial intelligence and focusing exclusively on limiting the spread of demonstrably wrong content. However, suppose the free exchange of views and ideas, which is one of the basic building blocks of a democratic society, is weakened or restricted. In that case, it will undoubtedly mean the inhibition of innovative procedures and the limitation of progress. In this context, it is necessary to realise that if there had not been similar confrontations in the past, we probably would not have witnessed new scientific discoveries.

If we were to use the words of the classic that the road to hell is paved with good intentions, then in this context, the adoption of harsh laws with a general ban on disseminating certain information raises questions: Who should be the arbiter of the truth? What would be the criteria of falsehood? Answers to these questions do not exist in a situation where terms or definitions in disinformation are unambiguous. Therefore, public authorities try to shift regulatory solutions and moral responsibility to media operators, although they are usually only hosts, not content creators. Obviously, when attention is a rare commodity, in the context of the attention economy as a modern business model, it is unlikely to be easy at all as long as the advertising market relies on gaining attention without moral inhibitions. This is also why social network operators and representatives of the online advertising ecosystem are expected to work together to eliminate disinformation and stop their monetisation through advertising revenue. However, the current measures to solve the problem of the spread of disinformation associated with the distribution of advertising online are, for now, only an appeal rather than a real solution.

References

Bond S. (2023). How documentary-style films turn conspiracy theories into a call to action. *NPR*. Available from: https://www.npr.org/2022/11/03/1133686674/how-documentary-style-films-turn-conspiracy-theories-into-a-call-to-action

Braun, J. A. & Eklund, J. L. (2019). Fake news, real money: ad tech platforms, profit-driven hoaxes, and the business of journalism. *Digital Journalism*, 7(1), 1-21. https://doi.org/10.1080/21670811.2018.1556314

Brynjolfsson, E. & Oh, J. (2012). *The Attention Economy: Measuring the Value of Free Digital Services on the Internet.* Orlando: International Conference on Information Systems, 2012. Conference Proceedings, part 9 – Economics and Value of Information Systems, pp. 1-19. ISBN 978-0-615-71843-9. Available from: https://aisel.aisnet.org/icis2012/proceedings/EconomicsValue/9

Butcher, P. & Neidhardt A. H. (2016). *Fear and lying in the EU: Fighting disinformation on migration with alternative narratives*. Brussels: European Policy Center. Available from: https://www.epc.eu/content/PDF/2020/Disinformation_on_Migration.pdf

Collins Dictionary. (2024). Attention Economy. *Collins Dictionary*. Available from: https://www.collinsdictionary.com/dictionary/english/attention-economy

Confessore, N. (2018). Cambridge Analytica and Facebook: The Scandal and the Fallout So Far. *The New York Times*. Available from: https://www.nytimes.com/2018/04/04/us/politics/cambridge-analytica-scandal-fallout.html

Davenport, T. H. & Beck, J. C. (2001). *The Attention Economy: Understanding the New Currency of Business*. Boston: Harvard Business Press, 255p. ISBN 978-1-578-51871-5.

Dholakia, N., Ozgun, A. & Atik, D. (2023). The miasma of misinformation: a social analysis of media, markets, and manipulation. *Consumption Markets & Culture*, (26)3, 217-232. https://doi.org/10.1080/10253866.2022.2149508

Diaz Ruiz, C. (2023). Disinformation on digital media platforms: A market-shaping approach. *New Media & Society*, 1-24. https://doi.org/10.1177/14614448231207644

Dušek, J., & Kavan, Š. (2024). Dezinformace jako součást hybridních hrozeb – česko-slovenský pohled. *Auspicia*, 21(1), 7-25. ISSN 2464-7217. Available from: https://vsers.cz/wp-content/uploads/2024/04/Auspicia_1_2024.pdf#page=7

Dwivedi, Y. K., Hughes, D. L., Carlson, J. et al. (2021). Setting the future of digital and social media marketing research: Perspectives and research propositions. *International Journal of Information Management*, 59, 102168. https://doi.org/10.1016/j.ijinfomgt.2020.102168

European Commission. (2018). Action Plan against Disinformation. *European Commission*. Available from: https://www.eeas.europa.eu/sites/default/files/action_plan_against_disinformation.pdf

European Commission. (2022). The 2022 Code of Practice on Disinformation. *European Commission*. Available from: https://digital-strategy.ec.europa.eu/en/policies/code-practice-disinformation

European Commission. (2024). EU citizenship: Rights and Opportunities. *Publications Office of the European Union*. 24 p. ISBN 978-92-68-10211-4 Available from: https://commission.europa.eu/document/download/c0441a72-c5c0-40d0-900f-c8af7d9b1a04_en?filename=Guide%20to%20EU_citizenship_EN_0.pdf

European Parliament. (2015). Directive (EU) 2015/1535 of the European Parliament and of the Council of 9 September 2015 laying down a procedure for the provision of information in the field of technical regulations and of rules on Information Society services. In *Eur-Lex*. Available from: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=celex%3A32015L1535

European Parliament. (2022). Regulation (EU) 2022/1925 of the European Parliament and of the Council of 14 September 2022 on contestable and fair markets in the digital sector and amending Directives (EU) 2019/1937 and (EU) 2020/1828 (Digital Markets Act). *Eur-Lex*. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R1925

European Parliament. (2022). Regulation (EU) 2022/2065 of the European Parliament and of the Council of 19 October 2022 on a Single Market For Digital Services and amending Directive 2000/31/EC (Digital Services Act). *Eur-Lex*. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32022R2065

European Union. (2016). Charter of Fundamental Rights of the European Union. *Official Journal of the European Union*. Available from: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A12016P%2FTXT

European Union. (2021). Protecting election integrity and promoting democratic participation. *Eur-Lex*. Available from: https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52021DC0730

Fallis, D. (2009). A conceptual analysis of disinformation. *IConference 2009 Proceedings*, pp. 1-8. ISBN 978-1-60558-626-7. Available from: https://www.ideals.illinois.edu/items/15210

Fallis, D. (2014). A functional analysis of disinformation. *IConference 2014 Proceedings*, pp. 621-627. ISBN 978-0-9884900-1-7. Available from: https://www.ideals.illinois.edu/items/47269

Frislich, L., Eldridge, S. A., Figenschou, T. U., Karoline Andrea Ihlebæk, K. A., Holt, C. & Cushion, S. (2023). Contesting the Mainstream: Towards an Audience-Centered Agenda of Alternative News Research. *Digital Journalism*, 11(5), 727-740. https://doi.org/10.1080/21670811.2023.2214791

GDI. (2019). The Quarter Billion Dollar Question: How is Disinformation Gaming Ad Tech? *Global Disinformation Index*. Available from: https://www.disinformationindex.org/research/2019-9-1-the-quarter-billion-dollar-question-how-is-disinformation-gaming-ad-tech/

GDI. (2020). Why is ad tech giving millions to EU disinformation sites? *Global Disinformation Index*. Available from: https://disinformationindex.org/2020/03/why-is-ad-tech-giving-millions-to-eu-disinformation-sites/

GDI. (2022). Measuring Disinformation Risk on TV News Programming: A Demonstration Study of Three U.S. Networks. *Global Disinformation Index*. Available from: https://www.disinformationindex.org/research/2022-10-06-measuring-disinformation-risk-on-tv-news-programming-a-demonstration-study-of-three-u-s-networks/

Hajdúková, T. (2023). Techniques for Manipulating Public Opinion in the Online Space During an Election Campaign as a Hybrid Threat. *Academic Journal of Interdisciplinary Studies*, 13(1), 14-23. https://doi.org/10.36941/ajis-2024-0002

Happer, C. & Philo, G. (2013). The Role of the Media in the Construction of Public Belief and Social Change. *Journal of Social and Political Psychology*, 1(1), 321-336. https://doi.org/10.5964/jspp.v1i1.96

Harper, M., Silva, M., Kaplan, S. & Simmons, S. (2021). Media and Narrative: Managing Conflict in Polarised Societies. *Institute for Integrated Transitions*. Available from: https://ifit-transitions.org/wp-content/uploads/2021/10/Media-and-Narrative-Managing-Conflict-in-Polarised-Societies.pdf

Hendricks, V. F. & Vestergaard, M. (2019). *Markets of Attention, Misinformation and Manipulation*. Cham: Springer, 2019. 144 p. ISBN 978-3-030-00813-0. https://doi.org/10.1007/978-3-030-00813-0

Hyland, K. (2023). Academic publishing and the attention economy. *Journal of English for Academic Purposes*, 64, 101253. https://doi.org/10.1016/j.jeap.2023.101253

ICNL. (2022). Legal Responses to Disinformation. *International center for not-for-profit law*. Available from: https://www.icnl.org/wp-content/uploads/2021.03-Disinformation-Policy-Prospectus-final.pdf

Juhász, A., & Szicherle P. (2017). The political effects of migration-related fake news, disinformation and conspiracy theories in Europe. *Friedrich-Ebert-Stiftung Büro/Political Capital*. Available from: https://politicalcapital.hu/pc-admin/source/documents/FES_PC_FakeNewsMigrationStudy_EN_20170607.pdf

Karlova, N. A. & Fisher, K. E. (2013). A social diffusion model of misinformation and disinformation for understanding human information behaviour. *Information Research*, 18(1), paper 573. ISSN 1368-1613. Available from: https://informationr.net/ir/18-1/paper573.html

Konšpirátori. (2024). Reasons behind creating this initiative. *Konšpirátori.sk*. Available from: https://konspiratori.sk/en

Lewandowsky, S., Cook, J., Ecker, U., Albarracín, D. & Kendeou, P. (2020). The Debunking Handbook 2020. *University of Nebraska*. Available from: https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1247&context=scholcom

Liu, F., Zhou, Y. & Hu, Y. (2024). An attention-based approach for assessing the effectiveness of emotion-evoking in immersive environment. *Heliyon*, 10(3), e25017. https://doi.org/10.1016/j.heliyon.2024.e25017

McCANN, M. (2024). What is the attention economy – and why is it such a problem? *Raidió Teilifís Éireann / Dublin City University*. Available from: https://www.rte.ie/brainstorm/2024/0403/1441388-what-is-the-attention-economy-social-media-addiction/

Molina, M. D., Sundar, S. S., Le, T., & Lee, D. (2021). Media and Narrative: Managing Conflict in Polarised Societies. *American Behavioral Scientist*, 65(2), 180-2021. https://doi.org/10.1177/0002764219878224

NIC. (2021). Foreign Threats to the 2020 US Federal Elections. *National Intelligence Council.* Available from: https://www.dni.gov/files/ODNI/documents/assessments/ICA-declass-16MAR21.pdf

Nixon, B. (2020). The business of news in the attention economy: Audience labor and MediaNews Group's efforts to capitalise on news consumption. *Journalism*, 21(1), 73-94. https://doi.org/10.1177/1464884917719145

OECD. (2022). Good Practice Principles for Public Communication Responses to Mis- and Disinformation. *Organisation for Economic Cooperation and Development – Public Governance Policy Papers*, No. 30, 44 s. ISSN 2707-9171 Available from: https://www.oecd-ilibrary.org/docserver/6d141b44-en.pdf?expires=1718099064&id=id&accname=guest&checksum=A6F128F8F0E65E09123A7CBA2FA1826C

Politics Dictionary. (2024). Attention Economy. *Politics Dictionary*. Available from: https://www.dictionary.com/e/politics/attention-economy/

Ryan, C. D., Schaul, A. J., Butner, R. & Swarthout, J. T. (2020). Monetising disinformation in the attention economy: The case of genetically modified organisms (GMOs). *European Management Journal*, 38(1), 7-18. https://doi.org/10.1016/j.emj.2019.11.002

Schleffer, G., & Miller, B. (2021). The Political Effects of Social Media Platforms on Different Regime Types. *Texas National Security Review*, 4(3), 78-103. http://doi.org/10.26153/tsw/13987

Simon, H. A. (1971). Designing organisations for an information-rich world. In Greenberger M (ed.): *Computers, Communications, and the Public Interest*. Baltimore: John Hopkins Press, 1971, pp. 38-52. ISBN 978-0-801-81135-7.

Soprano, M., Roitero, K., La Barbera, D., Ceolin, D., Spina, D., Demartini, G., & Mizzaro, S. (2024). Cognitive Biases in Fact-Checking and Their Countermeasures: A Review. *Information Processing & Management*, 61(3), article 103672. https://doi.org/10.1016/j.ipm.2024.103672

Statista. (2024). Digital advertising spending worldwide from 2021 to 2027. *Statista.com*. Available from: https://www.statista.com/statistics/237974/online-advertising-spending-worldwide/

U.S. Department of Justice. (2019). Report On the Investigation into Russian Interference in the 2016 Presidential Election. *United States Department of Justice*. Available from: https://www.justice.gov/storage/report_volume2.pdf

VFA. (2022). GARM Brand Safety Floor + Suitability Framework. *The World Federation of Advertisers*. Available from: https://wfanet.org/knowledge/item/2022/06/17/GARM-Brand-Safety-Floor--Suitability-Framework-3

VFA. (2022). GARM Brand Safety Floor + Suitability Framework. *World Federation of Advertisers*. Available from: https://wfanet.org/knowledge/item/2022/06/17/GARM-Brand-Safety-Floor--Suitability-Framework-3

Wajeeha, A., Sen, A., Eesley, C., & Brynjolfsson, E. (2024). The Role of Advertisers and Platforms in Monetizing Misinformation: Descriptive and Experimental Evidence. *National Bureau of Economic Research*. Available from: https://www.nber.org/papers/w32187

WEF. (2022). The four key ways disinformation is spread online. *World Economic Forum*. Available from: https://www.weforum.org/agenda/2022/08/four-ways-disinformation-campaigns-are-propagated-online/

World Bank. (2024). Digital Economy Framework. Digital Economy Foundations – 6 Pillars. *World Bank*. Available from: https://www.worldbank.org/en/programs/de4lac/digital-economy-framework

Yuting, X., Megat, A., Alsagoff, S. A. & Lay, H. A. (2020). The Role of Media in Consumption under "Attention Economies". *Journal on Interdisciplinary Studies in Humanities*, 12(6), 1-10. ISSN 0975-2935. Available from: http://rupkatha.com/V12/n6/v12n619.pdf

Funding: This work was supported by the Agency for the Support of Research and Development on the basis of Contract no. APVV-20-0334.

Data Availability Statement: More information and data can be obtained from the authors on a resonable request.

Author Contributions: The authors contributed equally, they have read and agreed to the published version of the manuscript.

Radoslav IVANČÍK, Assoc. Prof. Dipl. Eng., PhD. et PhD., MBA, MSc. is an associate professor at the Department of Informatics and Management, Academy of the Police Force in Bratislava, Slovakia.
ORCID ID: https://orcid.org/0000-0003-2233-1014

Pavel NEČAS, Prof. Dipl. Eng., PhD., MBA is a professor at the Matej Bel University in Banská Bystrica, Faculty of Political Science and International Relations, Department of Security Studies, Slovakia.
ORCID ID: https://orcid.org/ 0000-0001-7743-0453

Lucia IĽAŠČÍKOVÁ, Dipl. Eng. PhD., ING PAED-IGIP, LL.M is an assistant professor at the University of Security Management in Košice, Slovakia.
ORCID ID: https://orcid.org/0009-0000-9457-1274

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

Publisher
http://jssidoi.org/esc/home

QUALITY OF NON-FINANCIAL INFORMATION IN THE CONTEXT OF CORPORATE SUSTAINABILITY REPORTING DIRECTIVE (CSRD)

Jaroslav Sedlák [1], Jaromír Veber [2]

[1]*Pan-European University, Faculty of Entrepreneurship and Law, Spálená 76/14, 110 00, Praha 1, Czech Republic*
[2]*University of Chemistry and Technology, Department 837 School of Business, Technická 5, 166 28 Praha 6, Czech Republic*

E-mails:[1] sedlak@is.peuni.cz; [2] jaromir.veber@vscht.cz

Received 14 July 2024; accepted 5 November 2024; published 30 December 2024

Abstract. Recent developments in the EU regulatory framework, from the 2014 Non-Financial Reporting Directive (NFRD) to the 2021 Corporate Sustainability Reporting Directive (CSRD), have significantly increased ESG disclosure requirements for a more significant number of companies. Despite numerous studies on non-financial information, few specifically address the CSRD. This paper contributes to bridging this research gap. This paper aims to evaluate the quality of non-financial information (NFI) disclosed by companies subject to the CSRD from 2025, compare it to CSRD standards, and explore any correlation with company size. To achieve this aim, data on non-financial information (NFI) from 53 companies in a selected EU country was collected from annual reports and other sources, converted to quantitative indicators, and assessed to create Non-Financial Information Indexes (NFIIs). Using descriptive statistics, the construction of Company Size Indexes (CSI) and the application of Pearson's correlation coefficient, it was found that NFI quality does not meet CSRD standards and is positively, but not statistically significantly correlated with company size. The practical importance of this document is to provide feedback to companies on their non-financial reporting concerning CSRD standards and inform policymakers on this issue. The theoretical contribution lies in proposing a method for evaluating the published quality of NFIs based on the CSRD criteria and providing new insight into the correlation between NFI quality and company size.

Keywords: Corporate Sustainability Reporting Directive (CSRD), disclosure; non-financial information; non-financial reporting, quality.

Reference to this paper should be made as follows: Sedlák, J., Veber, J. 2024. Quality of non-financial information in the context of Corporate Sustainability Reporting Directive (CSRD). *Entrepreneurship and Sustainability Issues*, 12(2), 193-209. http://doi.org/10.9770/c5723389853

JEL Classifications: K3, M48, Q48, Q56, Q58

1. Introduction

In recent years, particularly within the European Union (EU), the regulatory landscape for non-financial reporting (NFR) has undergone significant developments. The EU's Non-Financial Reporting Directive (NFRD) in 2014 marked a seminal moment, setting the stage for enhanced disclosure requirements focused on providing stakeholders with a deeper understanding of a company's ESG (Environmental, Social, Governance) activities. According to La Torre et al. (2018), this directive improved the comparability of information and enhanced corporate accountability. NFRD is, however, currently being developed further by the Corporate Sustainability Reporting Directive (CSRD) proposed in 2021, with effect on 5th January 2023.

Compared to the NFRD, the CSRD expands the scope and detail of mandatory disclosure of non-financial information (NFI). For almost 50,000 companies in the EU, collecting and sharing sustainability information

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

will become the norm, compared to 11,700 companies subject to the NFRD (European Parliament, 2022). Companies covered by the CSRD must report according to the European Sustainability Reporting Standards (ESRS), which apply, with certain exceptions, from 1 January 2024 (European Commission, 2024). These standards aim to ensure unified, relevant, credible and reliable information on sustainability and the company across various environmental, social and governance issues. (Veber et al., 2023)

Many researchers have already emphasised the importance of NFR (NFI disclosure) in previous studies. Aguado-Correa et al. (2023) stated that non-financial information and its contribution to the achievement of the various Sustainable Development Goals (SDGs) is becoming vital in a business world where it is not enough to be economically sustainable without also being ethically, environmentally, and socially sustainable. Veber et al. (2023) say that NFR could contribute significantly to implementing the Green Deal. Similarly, Krawczyk (2021) stated that NFR is essential to demonstrate progress towards the Sustainable Development Goals (SDGs). Tarquinio & Posadas (2020) suggest that reporting non-financial information complements financial information, while (Velte & Stawinoga, 2017) see a key role of NFR in management control and stakeholder relations management.

Many researchers already focused on the impacts of NFR and the relationship between NFR and some company characteristics. Aluchna et al. (2022) and Cicchiello et al. (2023) proved that the introduction of NFRD positively impacts ESG performance. Aboud et al. (2024) see the mitigating effect of NFRD on ESG decoupling. Cuomo et al. (2022) concluded that firms that adopted corporate social responsibility (CSR) reporting experienced lower systematic risk and cost of equity after the enactment of the NFRD. Bigelli et al. (2023) concluded that NFRD has a positive impact on the board characteristics (e.g., gender diversity, cultural diversity, etc.), which was indirectly confirmed by Velte (2023) concluded that gender diversity had a positive impact on CSR performance and reporting. Abdullah et al. (2020) examined the relationship between environmental disclosure and company performance. Some other researchers tested the relationship between NFR and new technologies. Seretakis & Mezzanotte (2023) claim that the blockchain can help firms meet the CSRD's sustainability reporting requirements more effectively. Mehedintu & Soava (2023) see a positive influence of digitalisation on environmental performance.

There are also studies dealing with the quality of NFR. Ottenstein et al. (2022) argue that NFDR positively impacts the quantity and quality of sustainability reporting. Beretta et al. (2023), Radu et al. (2023) and (Velte, 2023) found that the conciseness, completeness and readability of NFR are significantly associated with board composition. Santamaria et al. (2021) highlight that the combinations of quality and quantity of non-financial disclosures (NFDs) play a significant role in the achieved level of ESG score. Monteiro et al. (2022) stated that the quality of NFI does not directly contribute to non-financial performance but indirectly through decision-making success. Dragomir et al. (2022) and Radu et al. (2023) proved a positive association between company size and the quality of the NFR; however, in the first case, linked to one specific country and a particular sample of companies and, in the second case as a result of systematic literature review, thus based on the secondary data.

Some studies already focused on new CSRD. One of those opens an interesting new factor – the impact of double materiality, with the identification of related potential legal risks and uncertainties (Mezzanotte, 2023) However, mandatory reporting requirements within the EU may also have unforeseen consequences for smaller companies that may be reluctant to include non-financial aspects in their reports (Kolk, 2010; Gavurova et al., 2022), even suggesting that a long list of possible CSR indicators in reports could discourage smaller companies from reporting on CSR (Gavurova et al., 2020; Belas et al., 2022).

The researchers' suggestions for additional surveys in the given research field also underline the topic's significance. Mezzanotte (2023), Posadas et al. (2023) and Ottenstein et al. (2022) identify the need for further research on the development of the respective legislation and its impact. Radu et al. (2023) provide even set of recommendations for the research – e.g., research on how different stakeholders react to different characteristics of NFD's, research on differences between the reporting under NFRD and CSRD, research on the risk of greenwashing in relation to the CSRD and research on the quality of sustainability reporting, which is also

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

supported by Aboud et al. (2024), who recommend investigating the impact of the NFRD on the quality of ESG reporting.

Building on previous studies and respecting the researchers' recommendations for further research, this paper aims to answer the question of what is the level of quality of non-financial information disclosed by all companies in the energy sector in the Czech Republic that have the potential to fall under mandatory NFR under the CSRD from 2025, compare to the level of quality envisaged by CSRD, and whether there is some correlation between the quality of this NFI disclosure and the size of the company. The fulfilment of the first part of the aim will provide specific information about the quality level of selected companies in the context of the upcoming CSRD. The fulfilment of the second part will enable a deeper understanding of the dynamics of non-financial reporting and will confirm or refute the findings of other researchers.

The reason for choosing a specific limited sample is the fact that the energy sector is a key sector of the national economy in all EU countries and, at the same time, one of the most significant contributors to environmental pollution, and therefore, should be the primary focus of our interest in this specific area of research. The Czech Republic can be considered a representative average sample across the EU in terms of industrial development, energy mix, and legislative status.

To meet the aim, two research questions are defined. RQ1 is used to assess the quality of non-financial information disclosed by selected companies, and RQ2 is used to determine whether there is some correlation between the quality of NFI disclosed by these companies and their size.

RQ1: What is the level of quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD?

Considering the nature of this research question, no hypothesis is defined in relation to this question.

RQ2: What is the relationship between the quality of the non-financial reporting and the company's size?

The following hypotheses are defined in relation to this research question: the null hypothesis H0 and the alternative hypothesis H1.

H0: There is no association between the quality of non-financial information disclosed by the company and the size of the company.

H1: The quality of non-financial information disclosed by the company is positively associated with the size of the company.

For clarity, the quality in the context of this paper also includes the amount of non-financial information disclosed.

2. Literature review

Considering the given research questions, the literature review focuses on data collection and processing methods related to evaluating the quality of NFI, which will create the basis for answering both questions.

To get the most comprehensive result, the principles of a systematic literature review are applied. Systematic literature review (SLR) differs from traditional narrative reviews by adopting a replicable, scientific, and transparent process. It helps to collect all related publications and documents that fit our pre-defined inclusion criteria to answer a specific research question (Mengist et al., 2020). During SLR process, 123 articles from the Web of Science databases (WoS) maintained by Clarivate Analytics and Scopus operated by Elsevier were identified using a predefined search string: "quality of non-financial reporting" OR "quality of non-financial

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

information" OR "quality of non-financial disclosure" OR "quality of ESG reporting" OR "quality of CSR reporting" OR "quality of integrated reporting" OR "quality of triple bottom line reporting" OR "quality of green reporting" OR "quality of double bottom line reporting" OR "quality of SDG reporting" OR "quality of CSR disclosure" OR "quality of ESG disclosure" OR "quality of sustainability disclosure" OR "quality of environmental disclosure" OR "quality of social disclosure" OR "quality of governance disclosure" OR "quality of ethical disclosure" OR "quality of green accounting", the result of an iterative process during which different keyword options and combinations, and search limitations (search within: article title, abstract, keywords; publication years: 2019, 2020, 2021, 2022, 2023, 2024; document types: article or review article or early access; languages: English), after removal of duplications. This number was then narrowed down based on defined inclusion and exclusion criteria (the only exclusion criterion was that the article was identified as a possible false positive. However, some articles were also excluded for other reasons, primarily because the articles were not available in open access), to 75 articles included in the review.

The result of the first part of SLR, dealing with selecting articles for the review, is explained by using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) 2020 flow diagram for systematic review (Figure 1).

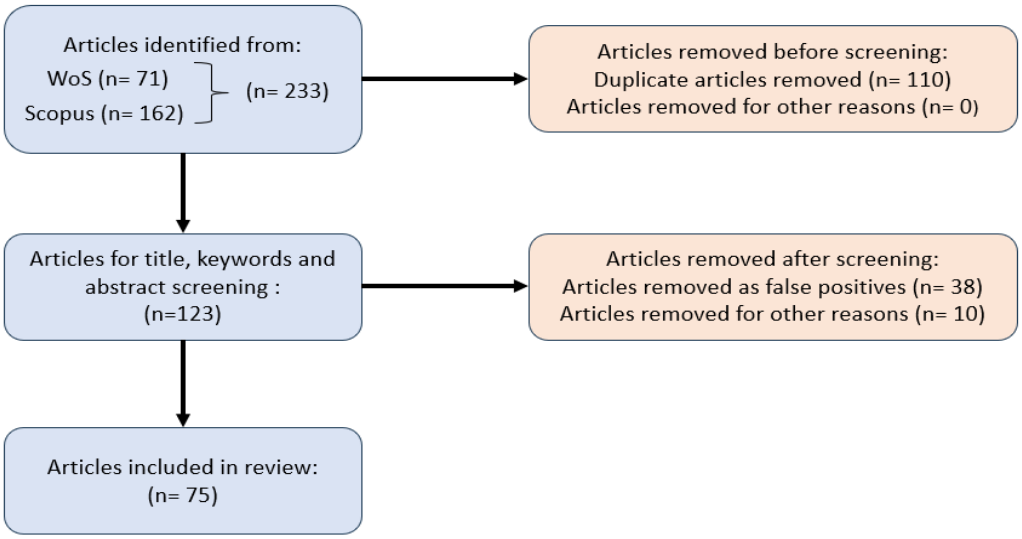


Figure 1. Flow diagram of SLR process

Source: own elaboration, design modified from PRISMA 2020 flows diagram proposed by Page et al. (2021).

The following are the results of the second part of the SLR process: an overview of selected key relevant findings related to data collection and processing methods in assessing the quality of NFIs and general findings related to the quality of NFIs.

Although the quality of non-financial disclosure is widely debated in the research community, there is no consistent approach to the issue. As stated by (Baalouch et al., 2019), there is no generally accepted definition of non-financial disclosure quality. Still, as further noted in their paper, in the previous studies, some researchers concluded that the quality is related to the extent to which the disclosure is helpful to external and internal parties. Because via the non-financial information, enterprises can better explain the company's strategy, social responsibility and business performance description in addition to the financial data of financial statements on financial position, operating results and cash flow, which facilitates the public's access to the relevant accounting information of enterprises and helps to improve the quality of accounting information (Zhang & Wang, 2024).

As outlined by Ismail et al. (2021), various guidelines have been established for the measurement of non-financial information, including the triple bottom line, Directive 95/2014/EU and the Global Reporting Initiative (SDG Compass, b.r.). The quality of non-financial disclosures can be assessed in various ways, including

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

subjective ratings, disclosure index studies, thematic content analysis, readability analysis and linguistic analysis (Le et al., 2022).

Busco et al. (2020) introduced a "Disclosure Topic Compliance Index" (DTCI), measured as the ratio of the number of disclosure topics for which the company reported at least one accounting metric to the total number of disclosure topics assumed by the relevant reporting standard. Baalouch et al. (2019) adopt five attributes: 'Relevance', 'Neutrality', 'Clarity', 'Comparability' and 'Verifiability', synthesising them using the simple arithmetic mean. Zhang & Wang (2024) considered three areas of the quality of NFI – similarity (with all other companies in the same industry), readability and forward-looking. Cosma et al. (2020) offer the methodology for the evaluation of the NFI quality based on the interpretation of any possible quantitative and qualitative content inspired by the 17 SDGs (GRI, the UN Global Compact and the World Business Council for Sustainable Development, n.d.), included in "non-financial statements" and "consolidated non-financial statements", relating to a specific accounting period, and taking into account the number of SDGs reported, the level of detail in the reporting, the number of sections in which the SDGs appear and the number of stakeholders. GRI-based evaluation of the NFI quality is offered by Orazalin & Mahmood (2020). Hategan et al. (2021) used a 5-point scale based on the completeness of the NFI included in NFI reports to assess the quality of NFI in these reports. Other researchers have also applied the evaluation of the NFI quality based on NFI's completeness (Le et al., 2022; Khan et al., 2019). The scoring process for evaluating the NFI quality is also implemented by Katmon et al. (2019), using financial and non-financial information. Ananzeh (2022) developed a methodology that introduced four CSR dimensions (human resources, environment, product stewardship and community engagement) working with a total of 41 indicators, assessing their occurrence in company documents and simply coding this occurrence – an item was scored as 0 if it was not disclosed in the annual report and 1 if it was disclosed. This created the input for calculating four CSR disclosure-related aspects (relative quantity, intensity degree, accuracy degree and management outlook). The study of Miao et al. (2021) applied score rates the status of CSR disclosure in four dimensions: overall (M) dimension, evaluated from the perspectives of corporate strategy, corporate governance, and stakeholders, with a total score of 30 points, content (C) dimension, evaluated from the perspectives of performance, human rights, environment, customer, and community involvement, with a total score of 45 points; technical (T) dimension, evaluated from the perspectives of comparability, credibility, standardisation, innovation, and transparency, with a total score of 15 points; and industry (I) dimension considering the special conditions of some industries, with a total score of 10 points, and the total score of the four items is 100 points. A similar approach was chosen by Badrul Muttakin et al. (2022) prepared the CSR disclosure index following the GRI sustainability reporting guidelines, which means that the index consisted of five categories (environment, labour practices, human rights, society, and product responsibility) and altogether 75 items, again scored by the occurrence of the information, using 4-point scale (from 0 to 3). A variation on the same theme is also offered by Dang et al., (2023) introducing the CSR disclosure index by evaluating the scores of five sets of criteria on a 0-1 scale; by (Omar & Alkayed, 2021) constructing an CSR index covering 36 items in 4 themes (environmental, human resources, community, products and others), measuring the quantity of CSR via the number of sentences and the quality of CSR by the weighting approach (on a scale of 0–3); by Shafai et al. (2022) developing a CSRD quality checklist comprising 40 items, scored three points if the disclosures include monetary data, two points if the CSR disclosures are comprehensive, one point if the disclosures are brief and 0 points if the disclosures are not disclosed at all; by Rauf et al., 2021) introducing disclosure index as per the GRI Sustainability Reporting Guidelines, modified based on the ten items already prescribed for the non-financial information by regulators - protection of shareholders in terms of corporate governance, meeting the benchmarks of returns, risk control, regularity in disclosure of operational information, shareholders review meetings, and timely communication, when these items were assigned with scores ranging from 0 to 3 points (0 if there is no information existing, 1 if only non-quantitative aggregate information is available, 2 if quantitative information is provided, and 3 if fiscal information is available); by Alkayed & Omar (2023) using CSRD index based on four categories (environmental, human resources, product and consumers, and community involvement), containing in total 40 items, processing by scoring and statistical methods; and by others. Evaluation of the NFI quality by the IR checklist contains 38 specific items under eight main categories based on the International Integrated Reporting Council (IIRC) framework (strategic focus and future orientation, connectivity of information, stakeholder relationship, materiality, risk management practices, conciseness, reliability and completeness and consistency, comparability and assurances) is used by Erin & Adegboye, (2022). Hassan (2021) utilised, concerning the

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

evaluation of the quality of NFI in annual reports, a simpler 2-point scale system - 1, if the disclosure is quantitative disclosure, graphs or narrative disclosure reports the actual policies and activities of a company concerning its social responsibility. 0, otherwise, whereby the quality score was measured by evaluating each sentence in social disclosure according to the previous rating and then was calculated as the average score (total score/number of sentences). Another approach to the evaluation of the NFI quality had Bini et al. (2023), who developed a method based on the evaluation of the consistency of disclosed non-financial key performance indicators (NFKPIs) analysis whether there is a development in the number of NFKPIs in time.

The SLR demonstrated no uniform approach to measure or evaluate the quality of NFI/NFR/NFD. However, there are also no fundamental contradictions. Almost all the methods used are similar in some way, differing more in the level of detail than in the underlying principle. Some of the methods used in the studies are based on evaluating the quality of NFIs against some official standards such as GRI's, SDG's, IFRS, etc., while some studies develop their benchmark in this respect. In both cases, however, the defined index, scoring principle and statistical methods are mostly used to process the data.

What is logically consistent in this area of research are the sources of data - annual reports and any publicly available non-financial information, either in reports or separately, e.g., on company websites, as well as the methodology of data collection. from the sources – the content analysis, i.e. the methodology that quantifies qualitative information (Erin & Adegboye, 2022). In most cases, This content analysis was performed manually by simply reading the selected document; however, some researchers, e.g. (Aguado-Correa et al., 2023), also used the tools of artificial intelligence (Natural Language Processing algorithm).

Some researchers have also analysed the development of NFI quality over time. In such cases, they mostly used the same methodology of evaluation of NFI quality one-time, just applied to the data from different years. Still, some of them used a different approach, e.g. (Omar & Alkayed, 2021), by establishing the paired sample t-test and Wilcoxon signed rank tests to reveal a change in the extent and quality of CSR disclosure practices.

The results of the SLR demonstrate that the most prevalent methodology (used in 55 studies of 75 studies included in the review) for evaluating the quality of published NFI is one based on a comparison with a selected official standard or a developed benchmark, using defined index, scoring principles and statistical methods. Given the nature of the research questions and the existence of relevant standards and directives (CSRD, ESRS and transposition of CSRD into Czech legislation in the form of an amendment to the Accounting Act), the most appropriate method for evaluating the quality of NFI published by companies in the Czech energy sector that are subject to mandatory NFRs under the CSRD from 2025 will be the method based on the defined index, using the ESRS or the provisions on Sustainability Reports under the amendment to the Accounting Act as a benchmark, with the application of scoring and statistical methods used by some of previous researchers.

The specifics of the research question RQ2 were already mentioned in Chapter 1. Dragomir et al. (2022) and Radu et al. (2023) demonstrated a positive relationship between firm size and NFR quality. A standard statistical method will evaluate the correlation between two sets of variables to test the defined hypothesis.

3. Data and methods

In accordance with the given research questions, the sample consists of companies in the Czech energy sector that have the potential to be subject to mandatory NFR within the framework of CSRD from 2025. However, to the authors' knowledge, there is currently no publicly available list of these companies. Thus, the selection of such companies was developed using our method for this paper.

According to the respective legislation, starting in 2025, the reporting requirements under the CSRD will apply to (i) large companies already subject to NFRD, and (ii) all large companies that have more than 250 employees, and a net turnover of more than EUR 40 million, or a total balance sheet exceeding EUR 20 million. To define the sample of companies from the Czech energy sector, the following approach was employed. The holders of the licenses from the Czech Energy Regulatory Office were identified using the licenses finder tool, accessible via the following link: https://eru.gov.cz/vyhledavac-licenci. The licenses in question were granted in the fields

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

of electricity production, electricity distribution, electricity transmission, gas production, gas storage, heat production, and heat transmission. However, the search in the fields of electricity production, electricity distribution, heat production, and heat distribution yielded an overwhelming number of results (approximately 30,000 companies). Consequently, it was necessary to limit the search further. The license finder allows the use of the filter based on installed power. The level of installed power was set at 10 MWe, with the assumption that the level of assets in the balance sheet was EUR 20 million or above and EUR 2 million per installed MW. This proposal was based on the cost of new installations, which ranged from EUR 0,5 million in the case of gas and solar PV to almost EUR 10 million per MW in the case of nuclear. Thus, the representation of individual sources in the energy mix was also estimated. The alternative approach, based on a net turnover of EUR 40 million and above, an average annual production rate (considering the average utilisation per sources), and an electricity price of approximately EUR 100 per MWh, would result in a filter of 90 MWe.

Consequently, a filter of 10 MWe was employed to avoid the risk of omitting some companies. A similar approach was used in the case of heat production, resulting in a filter of 200 MWt. This procedure resulted in the initial sample of 135 companies, in total, across the selected fields from the Czech energy sector, including however also companies from other sectors, with different core activities but providing, to a not insignificant extent, energy-related services in this paper, thus considered also as companies from the Czech energy sector. The initial sample will subsequently be subjected to further selection to identify those companies that fulfil the specified conditions. As mentioned above, these include having a minimum of 250 employees and a net turnover of at least EUR 40 million, or a total balance sheet exceeding EUR 20 million.

Due to this proposed sample selection procedure, it can be stated that the sample will be equal to the population in this case. The transferability of the findings from this study to companies from other sectors or other EU countries can, of course, be questioned; however, the reason for choosing a particular sector was already justified at the beginning of this study, and similar studies can easily confirm the general validity across the EU. Moreover, similar studies from other countries already exist, and as part of the discussion in this study, their results will be confronted with the result of this study.

To answer **RQ1**, i.e. to answer what the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD, following data sources, the data collection and data processing method will be used.

Data sources (data means *information* as defined and further specified in the text below) are the most available annual reports and other relevant reports or websites of selected companies to get the most comprehensive *information*.

The **data collection method**, in line with the methodologies used by all previous researchers in this field of research, is manual content analysis; the use of artificial intelligence tools is not considered.

Consistent with the results of the literature review, based on previous studies in this area, the quality of NFI disclosure of selected companies will be evaluated using an index, which is labelled, similar to the study of Carmo & Ribeiro (2022), as the non-financial information index (NFII).

The provisions of the sustainability report inspire the construction of this index in this paper according to the amendment to the Accounting Act No. 563/1991, which is the first part of the transposition of the CSRD into the Czech legislation and according to which the purpose of the sustainability report is to provide, as a separate section of the annual report, the information necessary to understand the impact of the entity's activities on sustainability and to understand the impact of sustainability on the development, performance and position of the entity (Accounting Act No. 563/1991, 2024). Sustainability means environmental matters, social matters, human rights matters, governance matters, employee matters, and anti-corruption and anti-bribery matters.

The proposed NFII, thus, should logically consist of six sub-indexes: environmental matters (ENV), social matters (SOC), human rights matters (HUM), governance matters (GOV), matters related to employees (EMP),

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

and anti-corruption and bribery matters (COR). Similar categories can be found, e.g., in Gláserová et al.'s study (2024). However, considering the utmost importance NFI disclosure (NFR) as a tool how to demonstrate progress towards the SDGs (Krawczyk, 2021), one additional sub-index focus specifically on whether the sources contain a description of the entity's plans to ensure that the entity's business model and strategy are compatible with the transition to a sustainable economy and with limiting global warming to 1,5 °C by the Paris Agreement and to achieve climate neutrality by 2050 under the directly applicable European Union legislation governing the European climate legal framework – the sub-index SDG. A similar approach, in terms of evaluation of NFI quality based on SDG, was introduced by Cosma et al. (2020).

Each sub-index is rated on a five-point scale, following the procedure used by Hategan et al. (2021), according to the extent of the information and its occurrence. This information, in the context of this methodology, means the information necessary to understand the impact of the entity's activities on sustainability and the impact of sustainability on the development, performance and position of the entity (hereafter referred to as *information*). The decisive factor for evaluation is the occurrence of the topic rather than the extent. A detailed description of the scoring scale is in Table 1 below.

Table 1. Description of the scoring scale

Score	Description
0	No *information* is available in the annual report, other reports, or websites (further as "other sources").
1	Limited *information* in other sources.
2	Limited *information* in the annual report or in the annual report and other sources.
3	Almost comprehensive *information* is available (in the annual report or other sources).
4	Comprehensive *information* is available in the annual report.

Source: own elaboration based on Hategan et al. (2021)

As seen from the above description, the total number of points each company can receive is 28 (7x4).

Regarding the **data processing method**, the descriptive statistical methods will be used to determine the mean, standard deviation, minimum, median, and maximum after evaluating the NFI quality level of each of the sampled companies (all sub-indexes), which is entirely in line with the previous studies, e.g. Hategan et al. (2021); Katmon et al., (2019); Carmo & Ribeiro (2022); Ananzeh (2022) and others.

Regarding **RQ2**, the data sources are the same as for RQ1, respectively, the data will already be available from the section dealing with RQ1. However, in additionally to the RQ1, hypothesis H1 defined for RQ2 needs to be tested, which will be performed by using the Pearson correlation coefficient (r), calculated according to the following formula:

$$r = \frac{n\Sigma xy - \Sigma x\Sigma y}{\sqrt{(n\Sigma x^2 - (\Sigma x)^2)(n\Sigma y^2 - (\Sigma y)^2)}}$$

Where:

- n is the total number of elements in the sample (i.e. the number of companies)
- x is the independent variable in the dataset (company size index)
- y is the dependent variable in the data set (non-financial information index)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

The size of each company in the sample will be determined using a purpose-built company size index (CSI) calculated according to the following formula:

$$CSI = (w_E n_E) + (w_T n_T) + (w_A n_A)$$

Where:

- w_E (w_T, w_A) is the weight of variable n_E (n_T, n_A)
- n_E is the normalised number of company employees
- n_T is the normalised size of the company's turnover
- n_A is the normalised size of the company's assets

The weights are proposed in the following values: w_E = 50%, w_T= 25% and w_A = 25%. The reason for this distribution can be found in the CSRD, in the condition defining whether a company falls under the CSRD. The primary condition is the number of employees, and the secondary condition of equal weight is turnover or asset size.

To get the normalised values for the company x from the sample, the principle of min-max normalisation will be applied based on the following formula:

$$n_{E(T,A)} = \frac{n_{E(T,A)x} - min_{E(T,A)}}{max_{E(T,A)} - min_{E(T,A)}}$$

Where:

- $n_{E(T,A)}x$ is the number of employees (value of company's turnover, value of company's assets) of the company x
- $min_{E(T,A)}$ is the minimal number of company employees (minimal value of company's turnover, minimal value of company's assets) from the sample
- $max_{E(T,A)}$ is the maximal number of company employees (maximal value of company's turnover, maximal value of company's assets) from the sample

A general comment on methodology at the end of this chapter - as is evident from the literature review in the previous chapter, there is no single correct methodology. On the contrary, in those areas of human interest that are only partially based on exact and rigid facts, there is a tendency to propose a plethora of techniques and methodologies. This fact has been highlighted by Veber et al. (2023), who, in their publication, summarised ISO and other institutions' standards relating to the environment, sustainability, climate change and circular economy, identifying almost 100 ISO standards and more than 10 valid standards. As a related issue, it should be noted that standards and norms do not always consider the sector's specificities. This should always be considered when selecting valid norms, standards and methodologies, and the fact that the results are likely to be relative, not always wholly objective and of general validity.

4. Result

This chapter is divided into two subsections, first presenting the findings according to the research questions RQ1 and second dedicated to findings related to RQ2. However, information about the final sample needs to be provided before the presentation of the research results.

As mentioned in the previous chapter, the initial sample consists of 135 companies from the Czech energy sector selected according to a specific defined key. To obtain the final sample, it was necessary to verify for these pre-selected companies whether they meet the conditions set out in the legal framework for companies to be covered by the CSRD from 2025, i.e. a minimum of 250 employees and a net turnover of at least EUR 40 million or a total balance sheet exceeding EUR 20 million. This verification was done using a freely accessible database of Czech firms available at https://www.informaceofirmach.cz/, where information on the number of employees and net turnover is available. In the case of a company with more than 250 employees but a net turnover of less

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

than EUR 40 million, the balance sheet information from the annual report of the company concerned, available from the public register, was further verified. The procedure described above led to a final sample of 53 companies.

4.1 NFI disclosure quality

Evaluation of quality of NFI disclosure of the selected companies, by the methods described in Chapter 3, specifically by NFII, answers the RQ1, i.e. reveal what is the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD.

In accordance with the defined procedure, annual reports from 2022 were used as data sources, as annual reports from 2023 were almost unavailable. Plus, the latest available sources such as websites, ESG reports, etc.
The result of the descriptive statistic for NFII and its sub-indexes is shown in Table 2 below.

Table 2. Result of the descriptive statistic_RQ1

Index	Mean	SD	Min	Median	Max
ENV	2.42	0.77	0.00	2.00	4.00
SOC	2.02	1.13	0.00	2.00	4.00
HUM	1.30	1.49	0.00	2.00	4.00
GOV	1.68	1.38	0.00	2.00	4.00
EMP	2.30	0.82	0.00	2.00	4.00
COR	1.55	1.49	0.00	2.00	4.00
SDG	1.35	1.52	0.00	0,00	4.00
NFII	12.58	7.76	0.00	10,00	28.00

Source: own elaboration

The average score of NFII, calculated using the defined sub-indexes, is 12.58 (i.e., 44.92% of the maximum value), while the median is 10,00 (i.e. 35.71% of the maximum value). Standard deviation is high (7.76), indicating a large variance, which is confirmed by minimal (0) and maximal (28.00) value of NFII. The sample population has a positive skew in NFII values at 0.30, indicating a higher frequency of lower values. Two companies achieved a maximum, 28.00 points, and one company got 0 points. 18 companies achieved 21 points, having almost comprehensive or comprehensive *information*, but not in the annual report.

Although not a direct part of the aim, focusing on the occurrence of information can also provide interesting insights into the quality of NFI disclosure. Regarding the occurrence of *information* related to the sub-indexes, almost all companies (96.23%) provided, to a different extent and in another source, *information* related to environmental matters (ENV), while the lowest occurrence in the sample, 47.17%, had the SDG sub-index, which indicates whether the company is in some way committed to the global Sustainable Development Goals (SDGs). Further details are provided in Table 3 below.

Table 3. Occurrence of *information*_RQ1

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG
% of occurrence	96,23%	83,02%	49,06%	64,15%	94,34%	54,72%	47,17%
No. of companies	51	44	26	34	50	29	25

Source: own elaboration

The occurrence is, logically, higher when annual reports and other sources are considered than when only annual reports are considered. However, as stated in Chapter 3, Data and Methods, according to the amendment to the Accounting Act No. 563/1991, which is the first part of the transposition of the CSRD into Czech legislation,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

the *information* should be included in the annual report. Thus, it might be interesting to identify the influence of the other sources. The result is shown in Table 4 below.

Table 4. Occurrence of information_annual reports vs. annual reports + other sources_2022

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG
% of occurrence / annual reports + other sources	96,23%	83,02%	49,06%	64,15%	94,34%	54,72%	47,17%
% of occurrence / annual reports	94,12%	62,75%	9,80%	39,22%	94,12%	17,65%	15,69%
% of occurrence / other sources	2,11%	20,27%	39,26%	24,93%	0,22%	37,07%	31,48%

Source: own elaboration

The *information* (or its part) related to environmental matters (ENV) and employee matters is almost in all annual reports of the monitored sample. In contrast, other sources supplement *information* (or its part) related to other matters (ca from 20% - 40%).

4.2 NFI disclosure quality vs. company size

As proposed in Chapter 3, Data and Methods, the linear correlation between NFII and CSI was calculated using the Pearson correlation coefficient (r) to test hypothesis H1 linked to the research question RQ2. The result, including the correlation coefficient (r) between the sub-indexes of NFII and CSI is presented in Table 5 below.

Table 5. Correlation coefficient (r)

Index	ENV	SOC	HUM	GOV	EMP	COR	SDG	NFII
Correlation coefficient (r)	0.215	0.108	0.095	0.102	-0.002	-0,045	-0.158	0.263

Source: own elaboration

The correlation coefficient (r) between NFII and CSI is 0.263, the correlation coefficients (r) between NFII's sub-indexes and CSI range from -0.158 to 0.215. The results show a positive correlation between the quality of NFI disclosure (NFII) and the company size (CSI). However, using the guide that Evans (1996) suggests for the absolute value of r: (0.00 – 0.19 = very weak), (0.20 – 0.39 = weak), (0.40 – 0.59 = moderate), (0.60 – 0.79 = strong), and (0.80 – 1.00 = very strong), it must be specified that this is a weak correlation. This indicates that as the size of the company increases, there is a tendency for the quality of non-financial information disclosed to increase. However, the strength of this association is not strong. A significance t-test for correlation was conducted with the following result to evaluate whether this correlation coefficient is statistically significant.

$$t = r\sqrt{\frac{n-2}{1-r^2}} = 0.263\sqrt{\frac{53-2}{1-0.263^2}} = 1.947$$

Where:

- • r is the correlation coefficient
- • n is the number of pairs of data (= the number of companies)

Based on the publicly available Student's t table for two-tailed tests, for 51 degrees of freedom at a 95% confidence level, the critical t-value is ±2.01. The calculated t-statistic t=1.956 is less than the critical t-value |t|=2.01. Because the absolute value of the t-statistic does not exceed the critical t-value, the result is not statistically significant at the 95% confidence level. Therefore, **the null hypothesis (H0) cannot be rejected.**

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

5. Discussion

Results related to research question **RQ1** "*What is the quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 compared to the quality envisaged by the CSRD?",* can be interpreted as follows.

The quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to be subject to mandatory NFR under the CSRD from 2025 does not meet the quality envisaged by the CSRD. Specifically, the mean score of the non-financial information index (NFII) used for the expression of the level of the quality of the NFI disclosed by the companies in the selected sample reaches 44.92%, whereby the median of NFII is 35.71%. This can be further interpreted in the way that the quality of NFI disclosure of 50% of the companies in the selected sample does not exceed ca 1/3 of the quality envisaged by the CSRD.

Comparing the results with similar studies in this research area is burdened by time and location specificities such as country of origin, data source, sample size, business sector, etc. However, authors such as Alkayed & Omar (2023) achieved similar results using similar methodologies. They analysed the extent and quality of NFI disclosed in the annual reports of 118 Jordanian companies between 2010 and 2015, concluding that the average extent of disclosure was found to be 53.5% and the average quality corresponds to 37.85%. Since this paper assesses both extent and quality together, the results are fully comparable in terms of figures. Even though this is a result obtained at a different time, in a different country (even not from the EU), with companies without a focus on the energy sector, this can be understood as a confirmation of the general validity of Kolk's statement (2010) that companies are somewhat reluctant to include non-financial aspects in their reports.

For a more relevant comparison, the study by (Gláserová et al., 2024) can be considered. Their study assesses the level of non-financial reporting by groups of banks in the Czech Republic in 2016 and 2021, with both companies subject to mandatory reporting and companies not subject to mandatory reporting in the sample. Considering the 2021 results, with the group of banks already subject to EU mandatory reporting (NFRD), together with large banks not yet subject to compulsory reporting but with the potential to fall under the new CSDR, which is closest to the conditions of this paper, the unweighted average level of non-financial reporting is 42.71%. Thus, the result is again fully comparable to the result of this paper.

Also, another study in this area by Hategan et al. (2021), evaluating the mandatory non-financial reporting of Romanian companies operating in the non-financial sector for the period 2017-2019, a study comparable to this article, reached a similar result, with an average score of 47.60% for the companies surveyed.

Regarding the influence of NFI in sources other than annual reports on the quality of disclosed NFI, which is not in line with the approach envisaged by the transposition of the CSRD into Czech legislation., the findings indicate a relatively significant influence. On average, 22.19% of the information needed to assess the quality of published NFIs was found in sources other than annual reports. This can be partially compared with the finding of Hategan et al. (2021), according to which about 45% of companies have CSR activities listed on their websites. However, it is not entirely clear from their study whether the information on CSR activities in the annual report available on the website is considered information from the annual report or the website (another source). In general, however, the fact that the information exists is considered more important than the source where the information can be found.

Regarding the research question **RQ2** *"What is the relationship between the quality of the non-financial reporting and the size of the company?"* the results show a positive association between the quality of NFI disclosure and the size of the company, but not statistically significant. Based on the data and the confidence level selected, there isn't enough statistical evidence to conclude that a larger company size correlates with better or higher quality of NFI disclosures, as proposed by the alternative hypothesis.

This result is partially consistent with Radu et al. (2023). They identified positive correlations between the quality of disclosed NFI and selected parameters characterising firm size (e.g., total costs, total revenues, number of employees, and total assets) from weak to strong. The different results could be justified because

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

they used a different methodology to calculate separate correlations between the quality of disclosed NFI and individually selected parameters characterising firm size. Furthermore, they did not test the statistical significance of correlations, so the result is only partially comparable.

6. Conclusions

This article aimed to answer the question of what is the level of quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to fall under mandatory NFR under the CSRD from 2025, compared to the level of quality envisaged by CSRD, and whether there is some correlation between the quality of this NFI disclosure and the size of the company.

To meet this aim, it was necessary to (i) translate the aim into specific research questions and related hypotheses, (ii) conduct a detailed literature search focusing on areas related to the research questions; (iii) develop a process for identifying companies that have the potential to fall under the mandatory NFR under the CSRD from 2025; (iv) develop a methodology for data collection and processing, including identification of data sources; (v) collect and process the data to obtain results relevant to the research questions and to test the defined hypothesis; and (vi) transfer the result, the answers to the given research questions, to specific findings that answer the question and confirm or refutes the hypothesis defined within the aim of this paper.

Specifically, after a detailed literature search, an initial sample of 135 companies from the Czech energy sector (or from other sectors with different core activities but providing energy-related services to a considerable extent) was defined using the proposed key, which was narrowed down to a final sample of 53 companies based on the established criteria. Data from these companies were selected using the chosen data collection method and processed according to the developed methodology. This led to results that fully answered the research questions and confirmed the defined hypothesis. As a final step in the process described above, these results are translated into the following findings:

(i) The quality of non-financial information disclosed by companies in the Czech energy sector that have the potential to fall under mandatory NFR under the CSRD from 2025 is insufficient, reaching approximately 45% of the quality envisaged by CSRD.

More specifically, only 2 of the 53 companies in the final sample have an NFR at the level expected by the CSRD, i.e. including its inclusion in the annual report, thus fully in line with the approach envisaged by the transposition of the CSRD into Czech legislation. 18 other companies achieved a similar level of NFR quality, but this was based on information from other sources. The rest of the companies disclose NFI of quality significantly below the level expected by the CSRD. However, it should be stressed that such a statement does not imply any criticism of this state of affairs. Indeed, most of the companies in the sample are not yet required to disclose NFIs at all or only to a very limited extent. On the contrary, the result can even be presented positively, in that some companies are already almost at the level expected by future legislation in terms of non-financial reporting.

(ii) A positive correlation between the quality of this NFI disclosure and company size was identified but not confirmed as statistically significant.

In view of the above, it can be concluded that the aim of this paper has been fulfilled in its entirety. However, certain limitations should be mentioned.

The first limitation relates to the results' validity or general applicability. Although the results of this study are comparable to those of other researchers in a similar area of research, they are subject to local and temporal specificities. However, this is due to the focus of this work and cannot be considered a deficiency. The second limitation is the objectivity of the results of converting qualitative data into quantitative indicators. However, this could easily be addressed, e.g. in a follow-up study, by involving another researcher or researchers to verify the results of converting qualitative data into quantitative indicators.

In terms of further research in this area, the findings of this paper could be confirmed by involving other researchers in the data collection process. A longitudinal study could also be considered once new annual reports are available from 2023 onwards, focusing on researching published NFIs' quality trends. And, of course, the research could be further expanded either in terms of a sample that would include other industries from other EU countries or in terms of focusing on what else besides company size might have some influence on the quality of disclosed NFI (e.g. board characteristics, financial performance, external audit, etc.), or what the relationship is between the quality of disclosed NFI and CSR performance. These areas have already been the subject of studies or other researchers, but almost always with some limitations (local and temporal specificities, sample size or one-sidedness, etc.) and given the urgency of the topic, objectification of the findings is desirable.

References

Abdullah, M., Hamzah, N., Ali, M. H., Tseng, M.-L., & Brander, M. (2020). The Southeast Asian haze: The quality of environmental disclosures and firm performance. *Journal Of Cleaner Production*, 246. https://doi.org/10.1016/j.jclepro.2019.118958

Aboud, A., Saleh, A., & Eliwa, Y. (2024). Does mandating ESG reporting reduce ESG decoupling? Evidence from the European Union's Directive 2014/95. *Business Strategy and the Environment*, 33(2), 1305–1320. https://doi.org/10.1002/bse.3543

Aguado-Correa, F., de la Vega-Jiménez, J., López-Jiménez, J., Padilla-Garrido, N., & Rabadán-Martín, I. (2023). Evaluation of non-financial information and its contribution to advancing the sustainable development goals within the Spanish banking sector. *European Research on Management And Business Economics*, 29(1). https://doi.org/10.1016/j.iedeen.2022.100211

Alkayed, H., & Omar, B. (2023). Determinants of the extent and quality of corporate social responsibility disclosure in the industrial and services sectors: The case of Jordan. *Journal of Financial Reporting and Accounting*, 21(5), 1206–1245. https://doi.org/10.1108/JFRA-05-2021-0133

Aluchna, M., Roszkowska-Menkes, M., & Kaminski, B. (2022). From talk to action: The effects of the non-financial reporting directive on ESG performance. *Meditari Accountancy Research*, 31(7), 1–25. https://doi.org/10.1108/MEDAR-12-2021-1530

Ananzeh, H. (2022). Corporate governance and the quality of CSR disclosure: Lessons from an emerging economy. SOCIETY AND BUSINESS REVIEW, 17(2), 280–306. https://doi.org/10.1108/SBR-09-2021-0153

Baalouch, F., Ayadi, S., & Hussainey, K. (2019). A study of the determinants of environmental disclosure quality: Evidence from French listed companies. *Journal of Management and Governance*, 23(4), 939–971. https://doi.org/10.1007/s10997-019-09474-0

Badrul Muttakin, M., Chatterjee, B., Khan, A., Getie Mihret, D., Roy, R., & Yaftian, A. (2022). Corporate political donations, board gender diversity, and corporate social responsibility: Evidence from Australia. *Journal of Business Research*, 152, 290–299. https://doi.org/10.1016/j.jbusres.2022.07.062

Belas, J., Škare, M., Gavurova, B., Dvorsky, J., & Kotaskova, A. (2022). The impact of ethical and CSR factors on engineers' attitudes towards SMEs sustainability. *Journal of Business Research*, 149, 589-598. https://doi.org/10.1016/j.jbusres.2022.05.056

Beretta, V., Demartini, M., & Sotti, F. (2023). Board composition and textual attributes of non-financial disclosure in the banking sector: Evidence from the Italian setting after directive 2014/95/ EU. *Journal of Cleaner Production*, 385. https://doi.org/10.1016/j.jclepro.2022.135561

Bigelli, M., Mengoli, S., & Sandri, S. (2023). ESG score, board structure and the impact of the non-financial reporting directive on European firms. *Journal of Economics and Business*, 127. https://doi.org/10.1016/j.jeconbus.2023.106133

Bini, L., Giunta, F., Miccini, R., & Simoni, L. (2023). Corporate governance quality and non-financial KPI disclosure comparability: UK evidence. *Journal of Management and Governance*, 27(1), 43–74. https://doi.org/10.1007/s10997-021-09608-3

Busco, C., Consolandi, C., Eccles, R., & Sofra, E. (2020). A Preliminary Analysis of SASB Reporting: Disclosure Topics, Financial Relevance, and the Financial Intensity of ESG Materiality. *Journal of Applied Corporate Finance*, 32(2), 117–125. https://doi.org/10.1111/jacf.12411

Carmo, C., & Ribeiro, C. (2022). Mandatory Non-Financial Information Disclosure under European Directive 95/2014/EU: Evidence from Portuguese Listed Companies. *Sustainability*, 14(8). https://doi.org/10.3390/su14084860

Cicchiello, A., Marrazza, F., & Perdichizzi, S. (2023). Non-financial disclosure regulation and environmental, social, and governance (ESG) performance: The case of EU and US firms. *Corporate Social Responsibility and Environmental Management*, 30(3), 1121–1128. https://doi.org/10.1002/csr.2408

Cosma, S., Venturelli, A., Schwizer, P., & Boscia, V. (2020). Sustainable development and european banks: A non-financial disclosure analysis. *Sustainability*, 12(15). https://doi.org/10.3390/su12156146

Cuomo, F., Gaia, S., Girardone, C., & Piserà, S. (2022). The effects of the EU non-financial reporting directive on corporate social responsibility. *European Journal of Finance*. https://doi.org/10.1080/1351847X.2022.2113812

Dang, T., Nguyen, N., Nguyen, T., Nguyen, T., Pham, T., Nguyen, T., Nguyen, B., & Do, T. (2023). Corporate social responsibility disclosures: evidence from Vietnamese banks. *Journal of Organizational Behavior Research*, 8(1), 259–274. https://doi.org/10.51847/aFEb9MI6bz

Dragomir, V., Dumitru, M., & Feleaga, L. (2022). The Predictors of Non-Financial Reporting Quality in Romanian State-Owned Enterprises. *Accounting in Europe*, 19(1), 110–151. https://doi.org/10.1080/17449480.2021.2018474

Erin, O., & Adegboye, A. (2022). Do corporate attributes impact integrated reporting quality? An empirical evidence. *Journal of Financial Reporting and Accounting*, 20(3/4), 416–445. https://doi.org/10.1108/JFRA-04-2020-0117

European Commission. (2024). Corporate sustainability reporting. https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en

European Parliament. (2022). Sustainable economy: Parliament adopts new reporting rules for multinationals. https://www.europarl.europa.eu/news/en/press-room/20221107IPR49611/sustainable-economy-parliament-adopts-new-reporting-rules-for-multinationals

Evans, R. (1996). An analysis of criterion variable reliability in conjoint analysis. *Perceptual and Motor Skills*, 82(3), 988–990. https://doi.org/10.2466/pms.1996.82.3.988

Gavurova, B., Belas, J., Bilan, Y., & Horak, J. (2020). Study of legislative and administrative obstacles to SMEs business in the Czech Republic and Slovakia. *Oeconomia Copernicana*, 11(4), 689–719. https://doi.org/10.24136/oc.2020.028

Gavurova, B., Schonfeld, J., Bilan, Y., & Dudas, T. (2022). Study of the Differences in the Perception of the Use of the Principles of Corporate Social Responsibility in Micro, Small and Medium-Sized Enterprises in the V4 Countries. *Journal of Competitiveness*, 14(2), 23–40. https://doi.org/10.7441/joc.2022.02.02

Gláserová, J., Otavová, M., & Blazková, J. (2024). Non-Financial Reporting by Banks in the Context of Current Development. *Montenegrin Journal of Economics*, 20(2), 117–130. https://doi.org/10.14254/1800-5845/2024.20-2.10

Hassan, N. T. (2021). Corporate social responsibility disclosure and financial information environment. *Accounting*, 7(1), 41–48. https://doi.org/10.5267/j.ac.2020.10.016

Hategan, C.-D., Pitorac, R.-I., & Milu, N.-D. (2021). Assessment of the mandatory non-financial reporting of romanian companies in the circular economy context. *International Journal of Environmental Research and Public Health*, 18(24). https://doi.org/10.3390/ijerph182412899

Ismail, H., Saleem, M. A., Zahra, S., Tufail, M. S., & Ali, R. A. (2021). Application of global reporting initiative (Gri) principles for measuring quality of corporate social responsibility (csr) disclosure: Evidence from Pakistan. *Sustainability*, 13(20). https://doi.org/10.3390/su132011409

Katmon, N., Mohamad, Z., Norwani, N., & Al Farooque, O. (2019). Comprehensive Board Diversity and Quality of Corporate Social Responsibility Disclosure: Evidence from an Emerging Market. *Journal of Business Ethics*, 157(2), 447–481. https://doi.org/10.1007/s10551-017-3672-6

Khan, I., Khan, I., & Senturk, I. (2019). Board diversity and quality of CSR disclosure: Evidence from Pakistan. *Corporate Governance-the International Journal of Business in Society*, 19(6), 1187–1203. https://doi.org/10.1108/CG-12-2018-0371

Krawczyk, P. (2021). Non-Financial Reporting-Standardization Options for SME Sector. *Journal of Risk and Financial Management*, 14(9). https://doi.org/10.3390/jrfm14090417

La Torre, M., Sabelfeld, S., Blomkvist, M., Tarquinio, L., & Dumay, J. (2018). Harmonising non-financial reporting regulation in Europe: Practical forces and projections for future research. *Meditari Accountancy Research*, 26(4), 598–621. https://doi.org/10.1108/MEDAR-02-2018-0290

Le, B., Nguyen, N., & Nguyen, C. (2022). Assessment of the Quality of Non-Financial Information Disclosure: Empirical Evidence from Listed Companies in Vietnam. *Journal of Asian Finance Economics and Business*, 9(5), 111–118. https://doi.org/10.13106/jafeb.2022.vol9.no5.0111

Mehedintu, A., & Soava, G. (2023). Approach to the Impact of Digital Technologies on Sustainability Reporting through Structural Equation Modeling and Artificial Neural Networks. *Electronics*, 12(9). https://doi.org/10.3390/electronics12092048

Mengist, W., Soromessa, T., & Legese, G. (2020). Method for conducting systematic literature review and meta-analysis for environmental science research. *MethodsX*, 7. https://doi.org/10.1016/j.mex.2019.100777

Mezzanotte, F. E. (2023). Corporate sustainability reporting: Double materiality, impacts, and legal risk. *Journal of Corporate Law Studies*. https://doi.org/10.1080/14735970.2024.2319058

Miao, Y., Zhou, X., & Dai, X. (2021). Corporate Social Responsibility Disclosure, Debt Financing Costs, and Innovation Capacity. *Discrete Dynamics in Nature and Society*, 2021. https://doi.org/10.1155/2021/4692383

Monteiro, A., Vale, J., Leite, E., Lis, M., & Kurowska-Pysz, J. (2022). The impact of information systems and non-financial information on company success. *International Journal of Accounting Information Systems*, 45. https://doi.org/10.1016/j.accinf.2022.100557

Omar, B., & Alkayed, H. (2021). Corporate social responsibility extent and quality: Evidence from Jordan. *Social Responsibility Journal*, 17(8), 1193–1212. https://doi.org/10.1108/SRJ-01-2020-0009

Orazalin, N., & Mahmood, M. (2020). Determinants of GRI-based sustainability reporting: Evidence from an emerging economy. *Journal of Accounting in Emerging Economies*, 10(1), 140–164. https://doi.org/10.1108/JAEE-12-2018-0137

Ottenstein, P., Erben, S., Jost, S., Weuster, C., & Zulch, H. (2022). From voluntarism to regulation: Effects of Directive 2014/95/EU on sustainability reporting in the EU. *Journal of Applied Accounting Research*, 23(1), 55–98. https://doi.org/10.1108/JAAR-03-2021-0075

Page, M., McKenzie, J., Bossuyt, P., Boutron, I., Hoffmann, T., Mulrow, C., Shamseer, L., Tetzlaff, J., Akl, E., Brennan, S., Chou, R., Glanville, J., Grimshaw, J., Hróbjartsson, A., Lalu, M., Li, T., Loder, E., Mayo-Wilson, E., McDonald, S., … Moher, D. (2021). The PRISMA 2020 statement: An updated guideline for reporting systematic reviews. *Systematic Reviews*, 10(1). https://doi.org/10.1186/s13643-021-01626-4

Posadas, S., Ruiz-Blanco, S., Fernandez-Feijoo, B., & Tarquinio, L. (2023). Institutional isomorphism under the test of Non-financial Reporting Directive. Evidence from Italy and Spain. *Meditari Accountancy Research*, 31(7), 26–48. https://doi.org/10.1108/MEDAR-02-2022-1606

Radu, O., Dragomir, V., & Hao, N. (2023). Company-Level Factors of Non-Financial Reporting Quality under a Mandatory Regime: A Systematic Review of Empirical Evidence in the European Union. *Sustainability*, 15(23). https://doi.org/10.3390/su152316265

Rauf, F., Voinea, C., Naveed, K., & Fratostiteanu, C. (2021). CSR Disclosure: Effects of Political Ties, Executive Turnover and Shareholder Equity. Evidence from China. *Sustainability*, 13(7). https://doi.org/10.3390/su13073623

Santamaria, R., Paolone, F., Cucari, N., & Dezi, L. (2021). Non-financial strategy disclosure and environmental, social and governance score: Insight from a configurational approach. *Business Strategy and the Environment*, 30(4), 1993–2007. https://doi.org/10.1002/bse.2728

SDG Compass. (b.r.). GRI, the UN Global Compact and the World Business Council for Sustainable Development. https://sdgcompass.org/sdgs/

Shafai, N. A., Amran, A., & Ganesan, Y. (2022). Corporate Social Responsibility, Earnings Management and Industry Type: Does CSR Reinforce Entrenchment Strategy? *Jurnal Pengurusan*, 64. https://doi.org/10.17576/pengurusan-2022-64-08

Tarquinio, L., & Posadas, S. (2020). Exploring the term "non-financial information": An academics' view. *Meditari Accountancy Research*, 28(5), 727–749. https://doi.org/10.1108/MEDAR-11-2019-0602

Veber, J., Švecová, L., & et al. (2023). Sustainability and sustainable management. GradaPublishing, ISBN 9788027 108978.

Velte, P. (2023). Does sustainable board governance drive corporate social responsibility? A structured literature review on European archival research. *Journal of Global Responsibility*, 14(1), 46–88. https://doi.org/10.1108/JGR-05-2022-0044

Velte, P., & Stawinoga, M. (2017). Integrated reporting: The current state of empirical research, limitations and future research implications. *Journal of Management Control*, 28(3), 275–320. https://doi.org/10.1007/s00187-016-0235-4

Zhang, C., & Wang, Y. (2024). Are ESG scores affected by the quality of non-financial disclosures? *International Review of Economics and Finance*, 93, 1431–1458. https://doi.org/10.1016/j.iref.2024.03.070

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/c5723389853

The authors contributed equally. All authors have read and agreed to the published version of the manuscript.

Jaroslav SEDLÁK is a PhD student at Pan-European University, Faculty of Entrepreneurship and Law, in Prague, Czech Republic. Research interests: economics, sustainability and power industry.
ORCID ID: https://orcid.org/0009-0004-0447-2758

Jaromír VEBER is a professor at University of Chemistry and Technology, Department 837 School of Business, in Prague, Czech Republic. Research interests: product and operations management, quality management, environmental management, sustainable management, organisational prosperity and performance, crisis management.
ORCID ID: https://orcid.org/0000-0001-7613-0002

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

Publisher
http://jssidoi.org/esc/home

ECONOMIC CONSEQUENCES OF WORK-RELATED DISORDERS*

Dagmar Camska [1], Lenka Svecova [2], Petra Kralova [3]

[1,2,3] University of Chemistry and Technology Prague, School of Business, Technická 5, Prague 6, 166 28, Czech Republic

E-mails:[1] dagmar.camska@vscht.cz; [2] lenka.svecova@vscht.cz; [3] petra.kralova@vscht.cz

Received 5 August 2024; accepted 6 November 2024; published 30 December 2024

Abstract. The paper aims to point out the high incidence level of musculoskeletal disorders (MSDs) in society and their related costs, which have an impact on different involved entities. Highlighting the leading cause of MSDs in developed countries could change attitudes and ways to solve this issue. The primary method employed herein is the literature review, supported by the secondary data provided by national and supranational institutions. The costs of MSDs mean a significant burden on society. MSDs belong to one of the most frequent occupational disease categories. Mainly, indirect and intangible costs affect workers, their families, employers, and society, although they are not as apparent as direct costs at the beginning when MSD occurs. Discovering an actual cause should lead to a solution. If most MSDs were work-related, workplaces would have to be changed. The strict application of ergonomics standards could reduce the incidence rate and decrease the total costs of MSDs. The unsolved issue is that employers must be more motivated to apply ergonomic standards fully because they share only a part of the total costs. Work-related musculoskeletal disorders are negative externalities whose reduction has to be enforced by the government.

Keywords: direct, indirect, intangible costs; ergonomics; productivity loss; economic burden; work-related disorders; musculoskeletal disorders (MSDs)

Reference to this paper should be made as follows: Camska, D., Svecova, L., Kralova, P. 2024. Economic consequences of work-related disorders. *Entrepreneurship and Sustainability Issues*, 12(2), 210-224. http://doi.org/10.9770/s7399839685

JEL Classifications: M20, J28, I1

1. Introduction

It should be emphasised already at the beginning that musculoskeletal disorders (MSDs) belong to a costly disease category with a significant impact on society. Van Tulder et al. (1995) claim it is the fifth most expensive category regarding work absenteeism and disablement. Lindgren (1998) proved musculoskeletal disorders were the most costly category in 1991, accounting for 23% of the total illness costs. Lee (1994) marks the costs of musculoskeletal disorders as an escalating problem. These diseases are more relevant because of the ageing population (Oh et al., 2011; Davis et al., 2014; Soltes & Gavurova, 2015).

It is even estimated that 14.5% of adults have symptoms of musculoskeletal diseases (Clarke & Symmons, 2006), the prevalence of this kind of disease ranges from 6.6% to 20.7% (Jordan et al., 2007), and that 10% of

* *This research was co-funded by the state budget by the Technology Agency of the Czech Republic and Ministry of Industry and Trade under TREND Programme. It is the project "Development of a system for monitoring and evaluation of the selected risk factors of the physical burden of work operations in context of Industry 4.0" under the grant number FW03010194.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

working-age adults have a work-related musculoskeletal condition (Morse et al., 1998). It should be pointed out that it is very difficult to distinguish which musculoskeletal disorders have occurred as work-related and which are non-work-related (Lipscomb et al., 2009). Although not all musculoskeletal disorders are connected to work (Baldwin, 2004), the burden of work-related disorders is significant from many perspectives (Stefko et al., 2016). Fasanya and Shofoluwe (2019) warn about the amount of work-related musculoskeletal disorders (WMSDs). US Data (U.S. Bureau of Labor & Statistics, 2004) prove that musculoskeletal disorders occupy 34% of all work-related injuries and illnesses. In comparison, the worldwide estimate reached 31% of all occupational diseases (Leigh et al., 1999), and therefore, MSDs were classified as the most frequent occupational diseases. Dombeková and Tuček (2018) state that the diseases caused by local muscular load are the most frequent occupational diseases in the Czech Republic. Minks et al. (2014) point out the specific repetitive strain injuries such as Carpal tunnel syndrome. This disorder occurs due to the carpal tunnel or a gap in the lower hand to the wrist narrowing. Minks et al. (2014) indicate that it is the most common mononeuropathy and the most frequent occupational disease. The occupational musculoskeletal disorders are the main factor of work disability (Gatchel, 2004).

Without distinguishing between work-related and non-work-related musculoskeletal disorders, they are the leading cause of absenteeism, disability (van Tulder, 1995; Almonacid et al., 2018), and pain (Almonacid et al., 2018), and they contribute significantly to the payments of sick leave in the developed countries (van der Zee-Neuen et al., 2015).

The paper aims to conduct the synthesis based on fragmented information and start a forthcoming scientific discussion about the role of employers and ergonomics in avoiding or at least reducing work-related musculoskeletal disorders. The primary method employed herein is the literature review based on published research papers on musculoskeletal disorders from different points of view, such as costs, involved and affected entities, the role of occupational ergonomics and employer in the process and their common impact on work-related musculoskeletal disorders. The literature review is accompanied by desk research based on the secondary data provided by national and supranational institutions.

The paper is structured into the following parts. The introduction is followed by a short literature review addressing the topic of costs. Emphasis on the literature review also continues in subsequent parts, such as Results and Discussion, because the paper type is a review paper. Conclusions summarise the main findings and possible role of employer and occupational ergonomics in work-related musculoskeletal disorders.

2. Theoretical background

The economic burden of MSDs seems remarkable according to the following numbers. Estimated costs of back pain reached 1.7% of the gross national product (GNP) in the Netherlands in 1991, and the costs of back pain covered approximately one-third of the costs of musculoskeletal diseases (van Tulder et al., 1995); therefore quantified the total cost of MSDs could even reach over 5% of GNP. Yelin and Callahan (1995) came to the estimate of 2.5% of gross domestic product in the case of MSDs in the USA. However, the total costs of musculoskeletal disorders were estimated to be 3.4% of gross domestic product in Canada in 1994 (Coyte et al., 1998). Swedish estimate reached a comparable 3.14% of the gross domestic product in 1994, according to the note of (Oh et al., 2011). American Academy of Orthopaedic Surgeons (2008) finished with one of the highest estimates of 7.7% of gross domestic product. There are also studies which could be positioned on the other side of the scale, such as Oh et al. (2011) estimating the costs reaching 0.7% of GDP in Korea in 2008 or Piedrahita (2006) coming to 0.2% of GDP in Colombia in 2005.

Different factors could cause detected differences in estimated costs among countries. It is always a question of methodology, disease classification, and the type of data used (van Tulder et al., 1995; Lindgren, 1998). Studies also differ according to the costs which are involved, which can cover direct, indirect, and specific modern category intangible costs (Dagenais et al., 2008). The topic of costs will be developed further in the Discussion. Organisations and institutions of healthcare, social welfare, and insurance systems would impact the value of estimated direct and indirect costs (van Tulder et al., 1995; Lindgren, 1998). Cultural differences would

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

seriously influence intangible costs and how people perceive the severity of complaints and pain. Some countries, especially developing ones, struggle with a lack of data and statistics, as emphasised in Piedrahita (2006), which could lead to national underestimations.

In spite of improvement contributing to early diagnoses declared by Gcelu and Kalla (2015) and the decreasing rate of non-fatal cases in the category musculoskeletal disorder injuries and illnesses in the USA since 2011 till 2020 published by National Safety Council (n.d.) percentage of disability-adjusted life years (DALYs) had increased comparing years 1990 and 2019 in the categories low back pain and other musculoskeletal disorders percentage according to data provided in Vos et al. (2020). This is consistent with warnings of the Burden of Global Disease 2010 Study that musculoskeletal disorders impose new challenges on health systems worldwide (Murray et al., 2012). Many governments are aware of this rising burden and acknowledge the issue of musculoskeletal disorders (Weinstein, 2000).

All studies consider musculoskeletal disorders to be a severe and expensive issue regardless of the estimated cost value. Some research works focus exclusively on work-related musculoskeletal disorders, concluding that they are the most or second most costly occupational diseases in the USA, Canada (Baldwin, 2004; Weahrer et al., 2005), and European countries (Eurogip, n.d.).

3. Research objective and methodology

The research objective is to start a forthcoming scientific discussion about the role of employers and ergonomics in avoiding or at least reducing work-related musculoskeletal disorders. The primary method employed herein is the literature review, which synthesises information fragmented in previously published research papers on musculoskeletal disorders from different points of view. These points of view cover costs, involved and affected entities, the role of occupational ergonomics and employer in the process and their common impact on work-related musculoskeletal disorders. The own desk research verifies the statements detected in the literature review conducted.

The research is based on the secondary data provided by national and supranational institutions. The aim is to prove that musculoskeletal disorders belong to the most or second most frequent occupational disease category. According to the literature review, significant differences between individual countries could be expected; therefore, the research also focuses on intercountry comparison.

4. Results

The results focus on verifying some statements provided in the literature review. These statements pointed out that musculoskeletal disorders belong to the most or second most frequent occupational disease category and that there could be differences between individual countries.

Table 1 shows significant differences in incidences of WMSDs reported by individual European countries. Although Eurostat collects the data and national authorities' discrepancies among data should follow, the identical methodology could hardly be explained. Factors could be cultural differences in the perceived severity of musculoskeletal conditions and pain (van Tulder et al., 1995), differences in the population age structure leading to higher chronicity and overall incidence, and differences in the amount of filled compensation claims.

It has to be admitted that it is very demanding to distinguish between work-related and non-work-related back pain (Baldwin, 2004) and all MSDs (Lipscomb et al., 2009) because there is uncertainty and lack of evidence to prove it. Some previous research papers conclude that employees do not fill out compensation claims for various reasons, although they have the right to do so. Morse et al. (1998) came with presumptuous estimates that 10% of workers have a work-related musculoskeletal condition, but only 10% claim workers' compensation. This could be supported by Rosenman et al. (2000), who announced that only one-quarter of affected workers filled the claim. The specific case of American carpenters shows that they tended to cover even work-related MSDs with private insurance instead of workers' compensation claims (Lipscomb et al., 2009).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

Statistics on occupational diseases in some countries have achieved a current level of excellence because of well-defined categories, consistent reporting, and governmental enforcement. Scandinavian countries such as Finland and Sweden are supposed to have very high standards in occupational health and safety (Piedrahita, 2006). Countries with the highest share of WMSDs in the workforce are Finland, Austria, Sweden, and Norway, confirming previous research findings about high occupational health and safety standards. The general conclusion could be that less developed countries entering the European Union later report a lower share of WMSDs. Polish data in 2020 seems distorted because such a high number was not achieved in any other country in the sample and hardly in countries with comparable historical and economic conditions.

Table 1. Incidence of work-related musculoskeletal disorders in European countries

Year	2007	2013	2020	2007	2013	2020
Country	Share of WMSDs on workforce in %			Share of WMSDs on all work-related health problems in %		
European Union - 27 countries	7.7	5.1	5.9	54.8	62.4	62.8
Austria	11.1	10.5	9.0	68.0	67.7	67.2
Belgium	7.3	4.6	4.9	58.1	55.9	56.1
Bulgaria	1.8	2.0	1.9	40.0	40.8	55.5
Croatia	4.4	4.1	3.7	53.1	50.0	59.9
Cyprus	5.2	4.0	2.7	58.8	67.1	73.1
Czechia	3.9	3.9	4.2	48.4	70.7	75.1
Denmark	6.6	3.6	3.5	61.3	63.7	53.7
Estonia	5.3	5.1	3.8	57.5	65.8	64.0
Finland	13.5	15.4	13.7	66.0	71.7	64.7
France	24.2	6.6	4.2	47.9	59.6	58.1
Germany	4.2	5.5	5.1	75.1	65.9	57.0
Greece	3.7	3.5	1.6	54.9	55.9	63.6
Hungary	3.5	2.6	1.6	61.6	47.5	58.5
Ireland	1.8	0.8	1.5	57.0	54.5	50.0
Italy	3.7	3.0	3.6	50.8	57.7	67.8
Latvia	N/A	4.1	3.4	N/A	58.7	74.2
Lithuania	1.8	1.8	1.2	43.5	66.3	63.4
Luxembourg	2.7	2.5	4.0	64.6	42.5	39.2
Malta	3.5	2.3	0.9	59.6	67.7	40.1
Netherlands	6.5	N/A	2.9	57.7	N/A	43.9
Poland	13.7	10.1	26.1	63.5	69.4	71.1
Portugal	1.7	2.9	3.4	49.4	52.9	61.8
Romania	2.0	0.9	1.8	40.6	49.9	60.9
Slovenia	5.4	3.2	2.4	57.9	57.8	56.8
Slovakia	3.7	6.6	5.1	59.6	67.4	72.2
Spain	3.4	2.7	3.6	60.8	58.4	59.8
Sweden	7.0	9.9	7.4	60.2	58.3	46.9
Non-members of EU						
Iceland	4.5	N/A	2.6	67.3	N/A	34.4
Norway	6.8	7.0	6.1	68.2	72.3	63.9
Switzerland	N/A	6.3	6.1	N/A	56.7	55.9

Source: authors based on data published by Eurostat n.d.

The numbers displayed in Table 1 depend on the way of measurement and reporting. Countries and employers implementing high ergonomics and safety standards will likely avoid at least some WMSDs and reduce associated costs and negative impacts on society. The reporting of such countries tends to have a higher share of WMSDs in the workforce because WMSDs are just at the centre of interest. According to the European data presented in Table 1, the Colombian incidence reported rate was several times lower than the incidence rate of Sweden or Finland (Piedrahita, 2006), which confirms the relationship between high standards in developed economies and higher reported rates of (W)MSDs.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

The time development of WMSDs in Table 1 is more illustrative because no general European trends can be detected. Contrariwise, the last three columns of Table 1 prove that WMSDs are the most significant work-related health problems because almost every country reports a share exceeding 50%. These findings support the view that WMSDs significantly burden society, and it is worth continuing the research in this area.

Not all work-related issues require hospitalisation or immediate homestay, causing time off work. Eurostat does not publish the data connected with individual diagnoses; therefore, Table 2 is based on some assumptions. When MSDs are the most often work-related health problem, as proved in Table 1, then general data would mainly depend on this disease category. The rate of employees out of work could be multiplied by the share of WMSDs on all work-related issues, and the rate of employees having WMSDs staying out of work is received. Values of this indicator are displayed in the second column of Table 2. It is also possible to calculate the share of workers having WMSDs continuing to work, the numbers of which are included in the third column of Table 2. The last column shows the sum of the previous two indicators. This sum should equal the share of WMSDs in the workforce in 2020, included in Table 1. The previous simplification caused a slight data discrepancy. This data discrepancy is relatively small and verifies that the accepted assumptions do not distort data quantified.

Table 2. Time off work of persons reporting WMSDS in European countries

Country	Percentage of persons reporting WMSDs resulting in time off work	Percentage of persons reporting WMSDs no resulting in time off work	Percentage of persons reporting WMSDs
European Union - 27 countries (from 2020)	2.82	2.86	5.68
Austria	5.33	3.42	8.75
Belgium	3.34	1.80	5.14
Bulgaria	0.52	1.07	1.59
Croatia	1.21	2.61	3.82
Cyprus	1.15	1.14	2.29
Czechia	2.31	1.58	3.89
Denmark	2.23	1.44	3.67
Estonia	2.25	1.43	3.68
Finland	1.24	14.56	15.80
France	2.84	1.49	4.33
Germany	2.46	2.06	4.52
Greece	0.92	0.81	1.73
Hungary	0.97	0.51	1.48
Ireland	0.90	0.41	1.31
Italy	1.55	1.53	3.08
Latvia	2.19	1.35	3.54
Lithuania	0.93	0.22	1.15
Luxembourg	3.39	0.98	4.37
Malta	0.37	0.27	0.64
Netherlands	2.09	0.89	2.98
Poland	8.81	16.35	25.16
Portugal	2.26	1.38	3.64
Romania	1.39	0.32	1.71
Slovenia	1.77	1.29	3.06
Slovakia	2.64	2.46	5.10
Spain	2.41	1.39	3.80
Sweden	3.10	4.66	7.76
Non-members of EU			
Iceland	2.41	0.63	3.04
Norway	4.45	2.76	7.21
Switzerland	3.50	3.06	6.56

Source: authors based on data published by Eurostat n.d.

It can be admitted that the Polish data would increase the European average, but still, the average shows that 2.82% of persons reporting WMSDs were off work temporarily in the EU in 2020. Generally, employees at home or even at the hospital incur higher costs of WMSDs than employees who continue working. This

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

disproportionality could be observed in Finish numbers because many affected workers continue working and do not take time off. In this case, such disproportionality is also a consequence of a higher reported share of workers reporting WMSDs than other countries. Contrariwise, it could be discussed if the person staying at work did not tend to have a higher risk of chronicity. This establishes a base for different cost categories to be involved, and increased attention should be paid to the relevant cost categories. The following text is focused on the structure of total costs related to MSDs.

5. Discussion

The results of the previous part confirmed that WMSDs belong to the most frequent occupational disease categories in the European Union; therefore, it can be assumed that their economic impact on society is significant. The impact estimated in papers introduced in the part of the Literature review depends on the costs involved in the specific studies. The literature, such as Dagenais et al. (2008) and Tarricone (2006), mainly distinguishes three main cost categories: direct, indirect, and intangible. Figure 1 presents the detailed cost structure of MSDs according to these three categories.

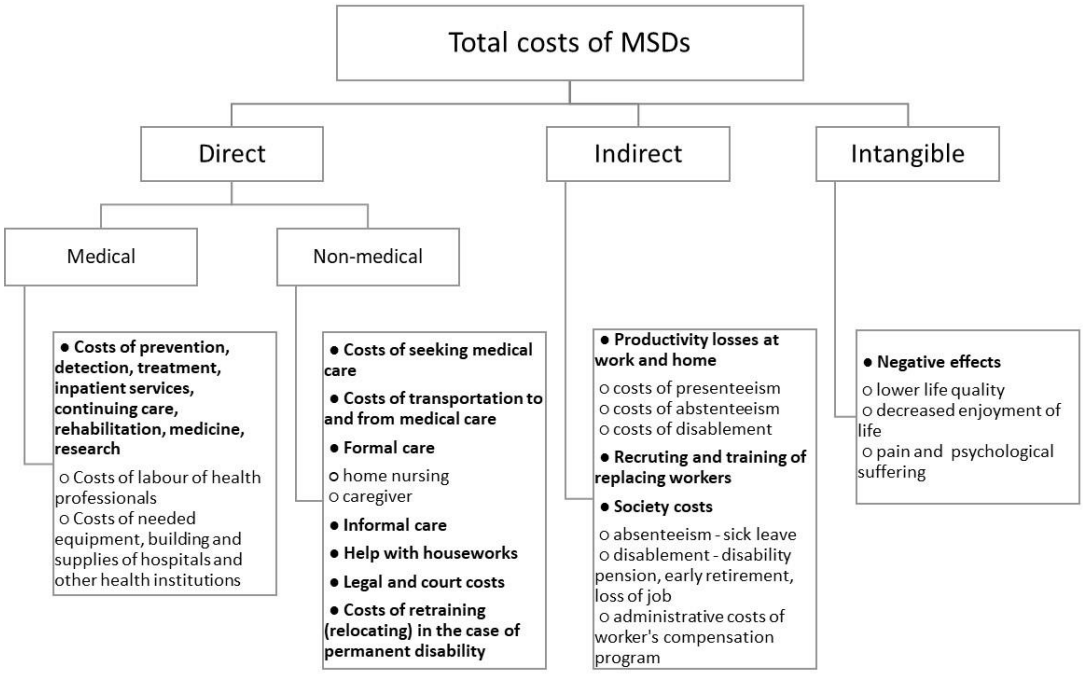


Figure 1. Division of total costs of MSDs

Source: authors based on literature review (van Tulder et al. 1995; Baldwin 2004; Piedrahita 2006; Dagenais et al. 2008; van den Akker et al. 2012)

Although direct costs seem apparent, they do not represent most of the overall costs (van Tulder et al., 1995; Dagenais et al., 2008). In some real cases non-medical costs outweigh medical costs of MSDs. Intangible costs remain in many studies omitted (Dagenais et al., 2008; Oh et al., 2011) because it is very complicated to measure and quantify them even for one single case; therefore, the estimation for the whole society is difficult to reach. Intangible costs remain very subjective (Oh et al., 2011) because affected persons should be asked according to their willingness to pay (Gafni, 1991; O'Brien & Gafni, 1996) for a hypothetical treatment that would care for their disorder. An alternative method applied by van den Akker et al. (2012) would be for respondents to be asked about their quality of life, which is translated into utility scores and related costs. The subjectivity of measurement still stays. This leads to a consequence in which the emphasis is mainly on indirect costs.

The estimated production losses influence indirect costs. For this kind of quantification, the human capital approach is often used in studies (Dagenais et al., 2008). This approach assumes that the worker cannot work and that the evaluation will follow the lost employees' wages and salaries. However, employers will tend to

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

replace employees who are absent and restore business productivity to the initial level as soon as possible. If the employer can replace the worker, the productivity will not be lost. Companies also hardly plan to utilise their capacity at 100% because of their risk management strategies; therefore, they can react even in the very short run and not lose 100% of the productivity provided by that given single diseased worker. Only a part of productivity is lost due to the absence because the remaining employees partially compensate for this loss. The long-run period would be influenced if the company could hire a new worker soon and provide sufficient training to this person who should have skills and abilities comparable to the diseased employee. Financial consequences would depend on the business situation. Important factors that should be considered are location, belonging to industry sectors, level of competition, labour market, and overall economic situation. Some companies can incur negligible additional costs when replacing workers, which can harm some companies. It should be pointed out that nowadays, many European economies are facing a lack of manpower in many fields and professions (Poór et al., 2021; Spadavecchia & Yu, 2021; Stefko et al., 2020) as well as accompanied by the aging population in the developed countries worldwide (Ivankova et al., 2022; Gavurova et al., 2020a,b; Oh et al., 2011; Davis et al., 2014; Coyte et al., 1998). This could serve as one motivating factor for businesses to comply with ergonomic rules, decreasing and avoiding MSDs.

Total costs of diseases estimated using the human capital approach could seem overestimated because, in fact, productivity is not entirely lost due to workers' disability. The human capital approach was widely used in studies focused exclusively on back pain, such as Ekman et al. (2005), Hansson and Hansson (2005), van Zundert and van Kleef (2005), Stewart et al. (2003) and job stress, such as Chang et al. (2022). The generation gap between workers (Šakytė-Statnickė et al., 2023) and the existence of a high-performance work system can also cause stress for workers (Cizrelioğulları & Babayiğit, 2022). Other problems such as poor working conditions, lower wages, long working hours, low motivating factors, high employee turnover (Devkota et al., 2023) and the socioeconomic conditions of countries (Navickas et al., 2022) can also cause stress and might increase health problems of workers. Migrant workers can be more vulnerable because of facing more restrictions (Přívarová et al., 2022). However, technological development has made employees work remotely (Andrade et al., 2023), which might decrease their stress. Stress can also be minimised by travel intention (Abou-Shouk et al., 2023), networking activities (Rozsa et al., 2022) and workshops (Ključnikov et al., 2022a). Reducing stress causes also increases the number of workers and stimulates the development of some industries (Matijová et al., 2023). Various researchers have also applied the human capital approach concerning firms' brand value (Plaikner et al., 2023) and digital transformation (Krajcik et al., 2023). The digital transformation process is also substantial for workers' problems since it enables businesses to implement innovative organisational strategies to react to changing conditions (Civelek et al., 2023a). This innovative attitude positively contributes to the sustainable development of companies (Civelek et al., 2023b). Firms that satisfy the needs of their workers and motivate them can also increase their reputation. In this regard, they can also become more likely to hire well-experienced and talented workers who can improve their innovation performance (Civelek & Krajčík, 2022) and success in the internationalisation process (Ključnikov et al., 2022b).

An alternative to the human capital approach could be called the friction period approach. This approach works with the previous description that the newly hired employee can replace the disabled worker. The friction method is more similar to the way in which businesses experience their workers' sick (Koopmanschap et al., 1995). Productivity is lost only during the friction period. The friction period should be assumed to be a long time. This question cannot be answered generally because the friction period will differ according to professions and business locations influenced by labour supply and elasticity. Study Bonnen et al. (2005) worked with a friction period of 22 weeks. Some research papers such as Walker et al. (2004), Hutubessy et al. (1999), Maniadakis and Gray (2000) tried to combine the human capital approach and friction period approach. Dagenais et al. (2008) concluded that, on average, the friction period approach provided estimates lower by 56% compared to the human capital approach. This confirms that the business losses do not reach such high values, and employers are less motivated to comply fully with ergonomic standards.

Another already emphasised issue is the ageing population, which could make it more complicated to find a new workforce in the case of productivity restoration. However, the ageing population has yet to be discussed because it influences current workers' age structure. Research papers coincide with significant implications for

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

businesses and society in relation to elderly workers. Although older employees have more experience and practice, which tends to lower rates of injury, according to Burton and Spieler (2001), they burden the system with more lost work days and wage compensation (Peele et al., 2005). Many industries have been hit by the increasing costs of work-related MSDs with age (Davis et al., 2014). Despite no significant difference in medical care costs between different age groups (Peele et al., 2005), older workers suffer chronic disorders and comorbidities (Burton & Spieler, 2001). The literature on chronicity in MSDs seems limited (Baldwin, 2004). It could be concluded that chronic cases of back pain contribute to significant indirect productivity losses (Frank et al., 1996; Williams et al., 1998), and therefore, chronic disorders tend to have relatively high indirect costs (Baldwin, 2004). It has to be admitted that chronic conditions have become the most significant burden on the healthcare systems in developed countries (Osborne et al., 2007), and chronic disorders have an impact not only on individuals but also on society.

Attention should be turned to entities affected by MSDs. Unfortunately, not only individuals and employers are negatively influenced. The economic burden on society is also relevant. However, the breakdown of costs for different entities should be explained. Figure 2 is the repetition of terms included in Figure 1, but it points out which groups and how they are affected. Impact on entities is essential when motives of their behaviour and power of actions of individual interested parties are analysed, explained, and anticipated. Baldwin (2004) points out that transfer compensation payments represent "only" re-allocating society's resources and do not cause any actual loss of resources. Including both – productivity losses and compensation payments – in cost estimations would be double counting. Figure 2 addresses four main groups – individuals, family members, employers, and society. The previous text has already focused on some of these groups.

The role of family members stays overlooked chiefly. They are responsible for informal care, whose importance can be significant in the case of severe injuries. Asfaw et al. (2015) warn that occupational injury can also impose a health burden on family members. Family members are exposed to the increasing risk of MSDs, taking care of the injured workers. The impact on family budgets is unambiguous when the income of affected workers mainly significantly decreases (Leigh et al., 1999; Brown et al., 2007; Boden et al., 2001). Family members can even be forced to reduce their work hours (Weil, 2001) when the injured person's care is needed to such an extent. Unfortunately, family consequences do not end with financial impacts and physical health issues. The family members can also experience emotional problems (Adams et al., 2002), resulting in divorce, separation (Keogh et al., 2000), and mental health issues (Adams et al., 2002). The findings of Asfaw et al. (2015) support the need to focus also on the secondary effects of occupational injuries and MSDs. Not only are the individual workers influenced, but there could also be a severe impact on their family members, which is also emphasised in Figure 2.

The amount of MSDs is remarkable, and some sources even state that there is still an increase in work-related musculoskeletal disorders (Fasanya & Shofoluwe, 2019), which cannot be confirmed by European data presented in Table 1. Employers should indisputably pay attention to this issue. Some findings prove different tendencies of employers. 52% of workplaces analysed exceeded local muscular load's health and safety limits (Dombeková & Tuček, 2019), which could lead to repetitive strain injuries. One of the most significant disadvantages of chronic disorders is that they have relatively high indirect costs (10). Employers tend to disregard some critical aspects of the job Fasanya and Shofoluwe (2019). The issue also addressed in Figure 2 is that the burden of an individual employer is lower than the costs to society (Meltzer, 2001). Employers need to see the effects clearly because social impacts and estimates do not solely change their behaviour, attitude, and working conditions. Quintana and Pawlowitz (1999) point out that management could be motivated to change the work methods and invest money into technological ergonomic solutions and preventive actions only if the estimated loss caused by work-related MSDs is beyond a tolerable threshold. Considering the economic perspective, Alder et al. (1997) explain that employers cannot be expected to implement all needed beneficial measures without legal incentives and government enforcement. State authorities creating political and legal environments contributing to the social environment play an essential role.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

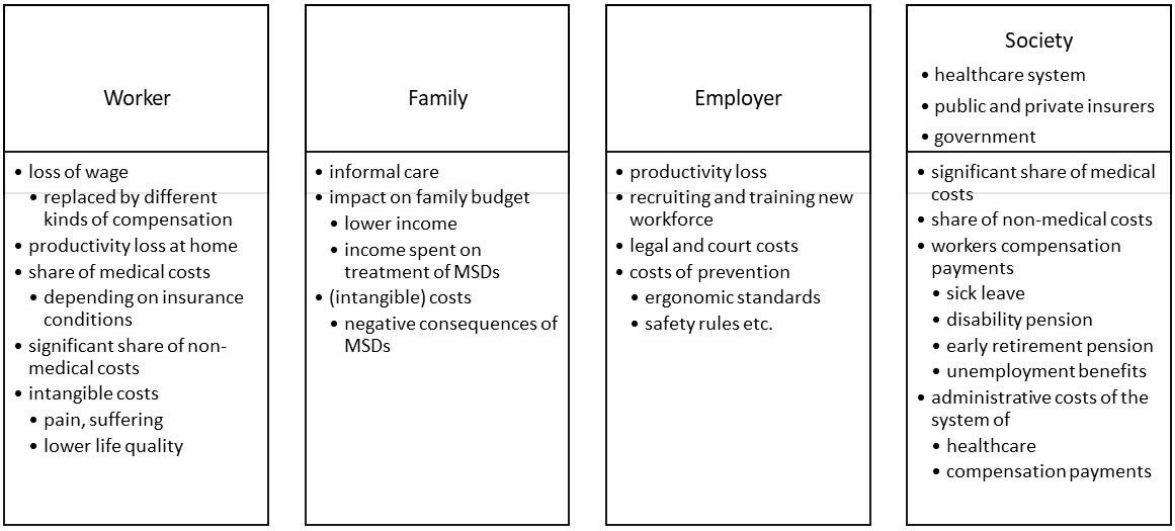


Figure 2. Cost impact on individual interested parties

Source: authors

Employers should clearly see the direct impacts of WMSDs. They have to be forced to their avoidance when employers' economic incentives are weaker than societal incentives. The scientific discipline that should be majorly contributed to is called ergonomics. Ergonomics is the discipline dealing with humans and their behaviour in the working process affected by the working environment and machines using tools (McCormick, Sanders 1982). The aim is to understand interactions among humans and other system elements to optimise human well-being and overall system performance (IEA, n.d.). Ergonomics should provide an employer with an effective way to "prevent and correct negative effects of the way of organising work" (Dul & Ceylan, 2011). Applying ergonomic concepts should improve work life quality, reduce musculoskeletal disorders, increase productivity (Afroz & Haque, 2021), and avoid serious human errors (Pavlovic-Veselinovic, 2014). The human aspect is observed in employee satisfaction and better health conditions, which would decrease the burden on society. Contrariwise, the employer viewpoint is presented by the cost reduction stemming from fewer injuries and occupational diseases (Rowan & Wright, 1995), business profitability (Zink & Fischer, 2018), manufacturing productivity, and employee loyalty (Dombeková & Tuček, 2019).

6. Conclusion

The key to solving any issue is to find an actual cause. This concept has been applied in economics and management since the 1960s when Ishikawa (1976) contributed to quality management. According to the numbers presented previously, the amount of MSDs and their economic burden is remarkable. Although it is very difficult to distinguish between work-related and non-work-related MSDs (Lipscomb et al., 2009; Baldwin, 2004), many sources state that work-related MSDs account for a significant part of occupational injuries and illnesses, and they impose noteworthy high costs on health, insurance systems, individual entities etc.

If the trigger of MSDs is the workplace itself, the workplace will have to be changed according to the fulfilment of ergonomic standards. The goal of society and governments is to develop high ergonomic standards to avoid acute and especially chronic MSDs. The government should enforce these ergonomic standards. From the economic point of view, employers will tend to remove only part of WMSDs because complete avoidance would cost more than it would create net effects for the employers. However, the impact on all involved entities, such as workers, family members, employers, and society, would be indisputably more significant and could outweigh the costs employers pay. This could only work with state interventions because employers' economic incentives are lower than societal incentives to avoid MSDs. It can be concluded that WMSDs are negative externalities of the work process.

References

Abou-Shouk et al. (2023). Travellers' attitude and intention towards post COVID-19 travel: The moderating role of traveller personality type. *Journal of Tourism and Services*, 14(27), 265-282. https://doi.org/10.29036/jots.v14i27.647

Adams, M. et al. (2002). *The social and economic consequences of workplace injury and illness*. Wellington: New Zealand Department of Labour.

Adler, P.S., Goldoftas, B., & Levine, D.I. (1997). Ergonomics, employee involvement, and the Toyota Production System: A case study of NUMMI's 1993 model introduction. *ILR Review*, 50(3), 416-437. https://doi.org/10.2307/2525183

Afroz, S., & Haque, M.I. (2021). Ergonomics in the workplace for a better quality of work life. In M. Muzammil, A.A. Khan, & F. Hasan (Eds.), Ergonomics for Improved Productivity: Proceedings of HWWE 2017 (pp. 503-511). Singapore (Singapore): Springer. https://doi.org/10.1007/978-981-15-9054-2_57

Almonacid, D.A. et al. (2018). Sick leave due to musculoskeletal disorders in the working population in a flower growing company in Colombia. *Revista de la Asociacion Espanola de Especialistas en Medicina del Trabajo*, 27(3), 166-174. Retrieved August 20, 2023 from http://www.aeemt.com/Revista_AEEMT_NF/VOL_27_N03_2018_SEP/NO%20SOCIOS/MDT%20VOL27%20N3%20NO%20SOCIOS.pdf

American academy of Orthopedic Surgeons (2008). *The burden of musculoskeletal disease in the United States*. Rosmond: Bone and Joint Decade.

Andrade, T.A. et al. (2023). Digital nomads' willingness to stay –a combined analysis of SEM and fsQCA results. *Journal of Tourism and Services*, 14(27), 161-180. https://doi.org/10.29036/jots.v14i27.586

Asfaw, A. et al. (2015). Musculoskeletal disorders and associated healthcare costs among family members of injured workers. *American Journal of Industrial Medicine*, 58(11), 1205-1216. https://doi.org/10.1002/ajim.22500

Balachandran, A. et al. (2020). Comparison of population aging in Europe and Asia using a time-consistent and comparative aging measure. *Journal of Aging and Health*, 32(5-6), 340-351. https://doi.org/10.1177/089826431882

Baldwin, M.L. (2004). Reducing the costs of work-related musculoskeletal disorders: targeting strategies to chronic disability cases. *Journal of Electromyography and Kinesiology*, 14(1), 33-41. https://doi.org/10.1016/j.jelekin.2003.09.013

Boden, L.I., Biddle, E.A., & Spieler, E.A. (2001). Social and economic impacts of workplace illness and injury: current and future directions for research. *American Journal of Industrial Medicine*, 40(4), 398-402. https://doi.org/10.1002/ajim.10013

Boonen, A. et al. (2005). Large differences in cost of illness and well-beingwell-being between patients with fibromyalgia, chronic low back pain, or ankylosing spondylitis. *Annals of the Rheumatic Diseases*, 64(3), 396-402. https://doi.org/10.1136/ard.2003.019711

Brown, J.A. et al. (2007). Social and economic consequences of workplace injury: A population-based study of workers in British Columbia, Canada. *American Journal of Industrial Medicine*, 50(9), 633-645. https://doi.org/10.1002/ajim.20503

Burton, J.F., & Spieler, E. (2001). Workers' compensation and older workers. In A. Hunt (Ed.), Ensuring Health and Income Security for an Aging Workforce (pp. 41-84). Washington, DC (USA): National Academy of Social Insurance. Retrieved August 15, 2023 from https://web.archive.org/web/20190426142512id_/https://research.upjohn.org/cgi/viewcontent.cgi?article=1180&context=up_press

Chang et al. (2022). How to improve tour leaders and guides service performance through emotional display rules –the moderating effect of job stress. *Journal of Tourism and Services*, 25(13), 156-175. https://doi.org/10.29036/jots.v13i25.403

Civelek, M., & Krajčík, V. (2022). How do SMEs from different countries perceive export impediments depending on their firm-level characteristics? System approach. *Oeconomia Copernicana*, 13(1), 55-78. https://doi.org/10.24136/oc.2022.002

Civelek, M., et al. (2023a). The impacts of dynamic capabilities on SMEs' digital transformation process: The resource-based view perspective. *Oeconomia Copernicana*. 14(4), 1367-1392. https://doi.org/10.24136/oc.2023.019

Civelek, M. et al. (2023). The impacts of innovative and competitive abilities of SMEs on their different financial risk concerns: System approach. *Oeconomia Copernicana*, 14(1), 327–354. https://doi.org/10.24136/oc.2023.009

Cizrelioğulları, M.N., & Babayiğit, M.V. (2022). Effects of high-performance work system on job satisfaction: The mediating role of psychological capital in the hotel employees of North Cyprus. *Journal of Tourism and Services*, 24(13), 43-70. https://doi.org/10.29036/jots.v13i24.284

Clarke, A.M., & Symmons, D.P.M. (2006). The burden of rheumatic disease. *Medicine* 34 (9), 333-335. https://doi.org/10.1053/j.mpmed.2006.06.007

Coyte, P.C. et al. (1998). The economic cost of musculoskeletal disorders in Canada. *Arthritis & Rheumatism: Official Journal of the American College of Rheumatology*, 11 (5), 315-325. https://doi.org/10.1002/art.1790110503

Dagenais, S., Caro, J., & Haldeman, S. (2008). A systematic review of low back pain cost of illness studies in the United States and internationally. *The Spine Journal*, 8(1), 8-20. https://doi.org/10.1016/j.spinee.2007.10.005

Davis, K. et al. (2014). Cost and disability trends of work-related musculoskeletal disorders in Ohio. *Occupational Medicine*, 64(8), 608-615. https://doi.org/10.1093/occmed/kqu126

Devkota, N, et al. (2023). Promoting sustainable tourist behavior through promotional marketing. *Journal of Tourism and Services*, 26(14), 219-241. https://doi.org/10.29036/jots.v14i26.512

Dombeková, B., & Tuček, D. (2018). A new evaluation method of local muscular load at workplaces in Czech companies. *Serbian Journal of Management*, 13(1), 157-171. https://doi.org/10.5937/sjm13-12884

Dul, J., & Ceylan, C. (2011). Work environments for employee creativity. *Ergonomics*, 54(1), 12-20. https://doi.org/10.1080/00140139.2010.542833

Ekman, M., Johnell, O., & Lidgren, L. (2005). The economic cost of low back pain in Sweden in 2001. *Acta Orthopaedica*, 76 (2), 275-284. https://doi.org/10.1080/00016470510030698

Eurogip. (n.d.) *Costs and funding of occupational diseases in Europe* (Eurogip-08/E). Paris: Eurogip. Retrieved August 22, 2023, from https://www.eurogip.fr/images/publications/Eurogip_cout_financement_2004_08E.pdf

European Communities. (n.d.) *Health and safety at work.* European Communities (Eurostat). Retrieved September 20, 2023, from https://ec.europa.eu/eurostat/web/health/database?node_code=hsw

Fasanya, B.K., & Shofoluwe, M. (2019). Occupational ergonomics: emerging approaches toward improved worker productivity and injury reduction. In R. Goonetilleke, & W. Karwowski (Eds.), Advances in Physical Ergonomics & Human Factors (pp. 385-395). Cham (Switzerland): Springer International Publishing. https://doi.org/10.1007/978-3-319-94484-5_40

Frank, J.W. et al. (1996). Disability resulting from occupational low back pain: Part II: What do we know about secondary prevention? A review of the scientific evidence on prevention after disability begins. *Spine*, 21(24) 2918-2929. https://doi.org/10.1097/00007632-199612150-00025

Gafni, A. (1991). Willingness-to-pay as a measure of benefits: relevant questions in the context of public decisionmaking about health care programs. *Medical Care*, 29(12), 1246-1252. Retrieved August 15, 2023 from https://www.jstor.org/stable/3765994

Gavurova, B., Rigelsky, M., & Ivankova, V. (2020a). Perceived health status and economic growth in terms of gender-oriented inequalities in the OECD countries. *Economics & Sociology*, 13(2), 245-257. https://doi.org/10.14254/2071-789x.2020/13-2/16

Gavurova, B., Ivankova, V., Rigelsky, M., & Kmecova, I. (2020b). How do gender inequalities in health relate to the competitiveness of developed countries? An empirical study. *Journal of Competitiveness*, 12(3), 99-118. https://doi.org/10.7441/joc.2020.03.06

Gatchel, R.J. (2004). Musculoskeletal disorders: primary and secondary interventions. *Journal of Electromyography and Kinesiology*, 14(1), 161-170. https://doi.org/10.1016/j.jelekin.2003.09.007

Gcelu, A., & Kalla, A.A. (2015). Musculoskeletal disorders-disease burden and challenges in the developing world. *SAMJ: South African Medical Journal*, 105(12), 1070-1071. https://doi.org/10.7196/samj.2015.v105i12.10260

Hansson, E.K., & Hansson, T.H. (2005). The costs for persons sick-listed more than one month because of low back or neck problems. A two-year prospective study of Swedish patients. *European Spine Journal*, 14(4), 337-345. https://doi.org/10.1007/s00586-004-0731-3

Hutubessy, R.C.W. et al. (1999). Indirect costs of back pain in the Netherlands: a comparison of the human capital method with the friction cost method. *Pain*, 80(1-2) 201-207. https://doi.org/10.1016/S0304-3959(98)00204-8

International Ergonomics Association (IEA). (n.d.) *Definition and Domains of Ergonomics*. International Ergonomics Association. Retrieved December 25, 2015, from http://www.iea.cc/whats/index.html

Ishikawa, K. (1976). *Guide to Quality Control*. Tokyo: Asian Productivity Organization.

Jordan, K., et al. 2007. Measuring disease prevalence: a comparison of musculoskeletal disease using four general practice consultation databases. *British Journal of General Practice*, 57, 7-14.

Ivankova, V., Gavurova, B., & Khouri, S. (2022). Understanding the relationships between health spending, treatable mortality and economic productivity in OECD countries. *Frontiers in Public Health*, 10, 1036058. https://doi.org/10.3389/fpubh.2022.1036058

Keogh, J.P. et al. (2000). The impact of occupational injury on injured worker and family: outcomes of upper extremity cumulative trauma disorders in Maryland workers. *American Journal of Industrial Medicine*, 38(5), 498-506. https://doi.org/10.1002/1097-0274(200011)38:5<498::AID-AJIM2>3.0.CO;2-I

Ključnikov, A., et al. (2022). Financial performance and bankruptcy concerns of SMEs in their export decision. *Oeconomia Copernicana*, 13(3), 867-890. https://doi.org/10.24136/oc.2022.025

Ključnikov, A., et al. (2022b). Export risk perceptions of SMEs in selected Visegrad countries. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 17(1), 173–190. https://doi.org/10.24136/eq.2022.007

Koopmanschap, M.A. et al. (1995). The friction cost method for measuring indirect costs of disease. *Journal of Health Economics*, 14(2), 171-189. https://doi.org/10.1016/0167-6296(94)00044-5

Krajcik, V. et al. (2023). Digital literacy and digital transformation activities of service and manufacturing SMEs. *Journal of Tourism and Services*, 26(14), 242-262. https://doi.org/10.29036/jots.v14i26.551

Lee, P. (1994). The economic impact of musculoskeletal disorders. *Quality of Life Research*, 3 (Suppl 1), 85-91. https://doi.org/10.1007/BF00433381

Leigh, J. et al. (1999). Global burden of disease and injury due to occupational factors. *Epidemiology* 10(5), 626-631. https://doi.org/10.1097/00001648-199909000-00032

Lindgren, B. (1998). The economic impact of musculoskeletal disorders. *Acta Orthopaedica Scandinavica*, 69 (sup281), 58-60. https://doi.org/10.1080/17453674.1998.11744795

Lipscomb, H.J. et al. (2009). Who is paying the bills? Health care costs for musculoskeletal back disorders, Washington State Union Carpenters, 1989-2003. *Journal of Occupational and Environmental Medicine* 51(10), 1185-1192. https://doi.org/10.1097/JOM.0b013e3181b68d0a

Matijová et al. (2023). Tourism indicators and their differentiated impact on sustainable tourism development. *Journal of Tourism and Services*, 14(27), 89-117. https://doi.org/10.29036/jots.v14i27.530

Maniadakis, N., & Gray, A. (2000). The economic burden of back pain in the UK. *Pain*, 84 (1), 95-103. https://doi.org/10.1016/S0304-3959(99)00187-6

McCormick, E.J., & Sanders, M.S. (1982). *Human Factors in engineering and design*. New York: McGraw-Hill.

Meltzer, M.I. (2001). Introduction to health economics for physicians. *The Lancet*, 358 (9286), 993-998. https://doi.org/10.1016/S0140-6736(01)06107-4

Minks, E. et al. (2014). Profesionální syndrom karpálního tunelu. *Neurologie pro Praxi*, 15 (5), 234-239. Retrieved September 15, 2023 from https://www.solen.cz/artkey/neu-201405-0003_Profesionalni_syndrom_karpalniho_tunelu.php

Morse, T.F. et al. (1998). The economic and social consequences of work-related musculoskeletal disorders: the Connecticut Upper-Extremity Surveillance Project (CUSP). *International Journal of Occupational and Environmental Health*, 4 (4), 209-216. https://doi.org/10.1179/oeh.1998.4.4.209

Murray, C.J.L. et al. (2012). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The Lancet*, 380(9859), 2197-2223. https://doi.org/10.1016/S0140-6736(12)61689-4

National Safety Council. (n.d.) *Musculoskeletal Injuries*. National Safety Council. Retrieved August 30, 2023, from https://injuryfacts.nsc.org/work/safety-topics/musculoskeletal-injuries/data-details/

Navickas, V., Petrokė, I., Urbanski, M., Soboleva, O.(2022). Macroeconomic factors influencing the development of the sharing economy in the Lithuanian Tourism Sector. *Journal of Tourism and Services*, 25(13), 248-266. https://doi.org/10.29036/jots.v13i25.437

O'Brien, B., & Gafni, A. (1996). When do the" dollars" make sense? Toward a conceptual framework for contingent valuation studies in health care. *Medical Decision Making*, 16 (3), 288-299. https://doi.org/10.1177/0272989X9601600314

Oh, I.-H. et al. (2011). The economic burden of musculoskeletal disease in Korea: a cross sectional study. *BMC Musculoskeletal Disorders*, 12(157), 1-9. https://doi.org/10.1186/1471-2474-12-157

Osborne, R.H. et al. (2007). Prevalence and cost of musculoskeletal disorders: a population-based, public hospital system healthcare consumption approach. *The Journal of Rheumatology* 34(12), 2466-2475. Retrieved August 17, 2023 from https://www.jrheum.org/content/34/12/2466.long

Pavlovic-Veselinovic, S. (2014). Ergonomics as a missing part of sustainability. *Work*, 49(3), 395-399. https://doi.org/10.3233/WOR-141875

Peele, P.B., Xu, Y., & Colombi, A. (2005). Medical care and lost work day costs in musculoskeletal disorders: older versus younger workers. In G. Costa, W.J.A. Goedhard, & J. Ilmarinen (Eds.), International Congress Series, Proceedings of 2nd International Symposium on Work Ability (pp. 214-218). Amsterdam (Netherlands): Elsevier. DOI: https://doi.org/10.1016/j.ics.2005.02.065

Piedrahita, H. (2006). Costs of work-related musculoskeletal disorders (MSDs) in developing countries: Colombia case. *International journal of Occupational Safety and Ergonomics*, 12 (4), 379-386. https://doi.org/10.1080/10803548.2006.11076696

Plaikner et al. (2023). Employer branding in tourism: How to recruit, retain and motivate staff. *Journal of Tourism and Services*, 14(27), 1-21. https://doi.org/10.29036/jots.v14i27.666

Poór, J. et al. (2021). The managerial implications of the labor market and workplace shortage in Central Eastern Europe. *Strategic Management* 26(2), 31–41. https://doi.org/10.5937/StraMan2102031P

Přívarová et al. (2022). Labour migration and tourism flows: the Case of the EU. *Journal of Tourism and Services*, 24(13), 271-289. https://doi.org/10.29036/jots.v13i24.374

Quintana, R., & Pawlowitz, I. (1999). A Poisson model for work-related musculoskeletal disorder cost estimation. *Safety Science*, 32 (1), 19-31. https://doi.org/10.1016/S0925-7535(99)00008-9

Rosenman, K.D. et al. (2000). Why most workers with occupational repetitive trauma do not file for workers' compensation. *Journal of Occupational and Environmental Medicine*, 42(1), 25-34. https://doi.org/10.1097/00043764-200001000-00008

Rowan, M.P., & Wright, P.C. Ergonomics is good for business. *Work study*, 43, 7-12. https://doi.org/10.1108/EUM0000000004015

Rozsa, Z., et al. (2022). Social capital and job search behavior in the services industry: Online social networks perspective. *Journal of Tourism and Services*, 25(13), 267-278. https://doi.org/10.29036/jots.v13i25.481

Soltes, M., & Gavurova, B. (2015). Quantification and comparison of avoidable mortality–causal relations and modification of concepts. *Technological and Economic Development of Economy*, 21(6), 917-938. https://doi.org/10.3846/20294913.2015.1106421

Spadavecchia, C., & Yu, J. (2021). Highly-skilled migrants, gender, and well-beingwell-being in the Eindhoven region. An intersectional analysis. *Administrative Sciences*, 11(3), 72. https://doi.org/10.3390/admsci11030072

Stefko, R., Gavurova, B., & Korony, S. (2016). Efficiency measurement in healthcare work management using Malmquist indices. *Polish Journal of Management Studies*, 13(1), 168-180. http://doi.org/10.17512/pjms.2016.13.1.16

Stefko, R., Gavurova, B., Ivankova, V., & Rigelsky, M. (2020). Gender inequalities in health and their effect on the economic prosperity represented by the GDP of selected developed countries—Empirical study. *International Journal of Environmental Research and Public Health*, 17(10), 3555. https://doi.org/10.3390/ijerph17103555

Stewart, W.F. et al. (2003). Lost productive time and cost due to common pain conditions in the US workforce. *Jama*, 290 (18), 2443-2454. https://doi.org/10.1001/jama.290.18.2443

Šakytė-Statnickė et al., (2023). Internal and external communication between employees of different generations: Emerging problems in Lithuanian, Latvian, and Swedish Tourism Organizations. *Journal of Tourism and Services*, 26(14), 1-24. https://doi.org/10.29036/jots.v14i26.427

Tarricone, R. (2006). Cost-of-illness analysis: what room in health economics? *Health Policy*, 77(1) 51-63. https://doi.org/10.1016/j.healthpol.2005.07.016

U.S. Bureau of Labor & Statistics. (2004). *Table 11. Number of non-fatal occupational injuries and illness with days away from work involving musculoskeletal disorders by selected worker and case characteristics*. U.S. Bureau of Labor & Statistics. Retrieved August 20, 2023, from http://www.bls.gov/iif/oshwc/osh/case/ostb1266.pdf

van den Akker-van Marle, M.E. et al. (2012). Cost of rheumatic disorders in the Netherlands. *Best Practice & Research Clinical Rheumatology* 26 (5), 721-731. https://doi.org/10.1016/j.berh.2012.08.005

van der Zee-Neuen, A. et al. (2015). Effects and Costs of a Return to Work Program for Patients with Recent Sick-Leave Due to Musculoskeletal Disorders. *Annals of the Rheumatic Diseases*, 74 (Suppl 2), 124-125. https://doi.org/10.1136/annrheumdis-2015-eular.2207

van Tulder, M.W., Koes, B.W. & Bouter, L.M. (1995). A cost-of-illness study of back pain in The Netherlands. *Pain*, 62 (2), 233-240. https://doi.org/10.1016/0304-3959(94)00272-G

van Zundert, J., & van Kleef, M. (2005). Low Back Pain: From Algorithm to Cost-Effectiveness? *Pain Practice* 5(3), 179-189. https://doi.org/10.1111/j.1533-2500.2005.05303.x

Vos, T. et al. (2020). Global burden of 369 diseases and injuries in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet*, 396(10258), 1204-1222. https://doi.org/10.1016/S0140-6736(20)30925-9

Walker, B.F., Muller, R., & Grant, W.D. (2004). Low back pain in Australian adults. Health provider utilisation and care seeking. *Journal of Manipulative and Physiological Therapeutics*, 27(5), 327-335. https://doi.org/10.1016/j.jmpt.2004.04.006

Waehrer, G., Leigh, J.P., & Miller, T.R. (2005). Costs of occupational injury and illness within the health services sector. *International Journal of Health Services*, 35(2), 343-359. https://doi.org/10.2190/RNQ3-0C13-U09M-TENP

Weil, D. (2001). Valuing the economic consequences of work injury and illness: a comparison of methods and findings. *American Journal of Industrial Medicine*, 40(4), 418-437. https://doi.org/10.1002/ajim.1114

Weinstein, S.L. (2000). 2000–2010: the bone and joint decade. *The Journal of bone and joint surgery* 82 (1), 1–3. Retrieved September 29, 2023 from https://journals.lww.com/jbjsjournal/fulltext/2000/01000/2000_2010__the_bone_and_joint_decade.1.aspx

Williams, D.A. et al. (1998). Health care and indemnity costs across the natural history of disability in occupational low back pain. *Spine*, 23(21), 2329-2336. https://doi.org/10.1097/00007632-199811010-00016

Yelin, E., Callahan, L.F., & National Arthritis Data Work Group. (1995). Special article on the economic cost and social and psychological impact of musculoskeletal conditions. *Arthritis & Rheumatism*, 38(10), 1351-1362. https://doi.org/10.1002/art.1780381002

Zink, K.J., & Fischer, K. (2018). Human factors and ergonomics: Contribution to sustainability and decent work in global supply chains. In A. Thatcher, & P.H.P. Yeow (Eds.), Ergonomics and human factors for a sustainable future: Current research and future possibilities (pp. 243–269). Singapore (Singapore): Palgrave Macmillian. https://doi.org/10.1007/978-981-10-8072-2_10

Funding: This research was co-funded by the state budget by the Technology Agency of the Czech Republic and Ministry of Industry and Trade under TREND Programme. It is the project "Development of a system for monitoring and evaluation of the selected risk factors of the physical burden of work operations in context of Industry 4.0" under the grant number FW03010194.

Author Contributions: Conceptualisation: *Svecova*, *Camska*; methodology: *Camska*; data analysis: Camska, *Svecova*, writing—original draft preparation: *Camska*, writing; review and editing: Kralova; visualisation: Camska. All authors have read and agreed to the published version of the manuscript.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s7399839685

Dagmar CAMSKA is the Assistant Professor at School of Business of University of Chemistry and Technology Prague having PhD degree in the field of Business Economics and Management. She is the lecturer in the English bachelor study program Economics and Management and English master study program Innovation Project Management. Research interests: corporate finance and business bankruptcies.
ORCID ID: https://orcid.org/0000-0003-4597-379X

Lenka SVECOVA is the Associate Professor at University of Chemistry and Technology Prague having PhD degree in the field of Business Economics and Management. She is the head of School of Business at the aforementioned university and lecturer in the English and Czech bachelor study program Economics and Management and English and Czech master study program Innovation Project Management. Research interests: business management and project management.
ORCID ID: https://orcid.org/0000-0002-0329-2921

Petra KRALOVA is the Assistant Professor at School of Business of University of Chemistry and Technology Prague having PhD degree in the field of Product Management. She is the lecturer in the English and Czech bachelor study program Economics and Management. Research interests: business management and marketing.
ORCID ID: https://orcid.org/0000-0002-1607-7243

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Publisher
http://jssidoi.org/esc/home

EXPLORING THE IMPORTANCE OF LOGISTICS IN THE STRATEGIC BUSINESS DECISIONS OF BULGARIAN SMEs*

Ivan Dimitrov [1], Emanuila Antonova [2], Adile Dimitrova [3]

[1,2,3] Prof. Dr Asen Zlatarov University-Burgas, 1 Prof. Yakimov str, 8010 Burgas, Bulgaria

E-mails: [1] i.t.dimitrov@abv.bg; [2] emanuila.antonova@gmail.com; [3] adiledimitrova@abv.bg

Received 17 August 2024; accepted 10 November 2024; published 30 December 2024

Abstract. Business without logistics? That is no longer a question in present-day entrepreneurship; small businesses are no exception. Logistics evolved into a workable business function in corporate strategy, and what nowadays could split the involved group of researchers and managers is only their consideration of logistics weight in a successful business formula. Small business entrepreneurs are challenged to place the mark for the limit of logistics importance properly. Small businesses seeking to ensure a safe place in a competitive supply chain need to evaluate the significance of logistics for their success. The centre of attention of this research is the logistics notability amongst other functional areas in the strategic business decisions for Bulgarian SMEs. The reasons to make or buy logistics have been analysed through criteria tools focusing on financial performance, business priorities and service elasticity for the thorough satisfaction of stakeholders. The research project aims to explore the importance of logistics for small enterprises through a quantitative assessment of logistics elements in Bulgarian examples. The primary research outcome is joined to the affirmation of scientific hypotheses about the crucial level of logistics transaction and translation costs, logistics outsourcing ratio, business flexibility, the leading factors for partnership and market impact for Bulgarian SMEs. Through a standardised questionnaire approach and data processing to regression multilinear analysis, valuable information is obtained that may influence the successful decision-making of Bulgarian professionals. In-vivo findings ex genuine business could be promoted amongst educational studies to teach future experts in management and economics with an accent on the area's business-specific conditions.

Keywords: logistics SMEs; significance of logistics; supply-chain management for SMEs; strategic decisions for SMEs

Reference to this paper should be made as follows: Dimitrov, I., Antonova, E., Dimitrova, A. 2024. Exploring the importance of logistics in the strategic business decisions of Bulgarian SMEs. *Entrepreneurship and Sustainability Issues*, 12(2), 225-242. http://doi.org/10.9770/p6775548395

JEL Classifications: D20, D22, O31, O32, O33, O39, M15, M29

* *This research was funded by Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Project NIH 485/2023*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

1. Introduction

For SMEs, logistics is one of the most significant challenges of modern management (Lu & Shaharudin, 2024). Competitiveness can be defined as the ability to provide products more efficiently than competitors (Tu et al., 2023). Business logistics strategies implement companies' procedures for the improvement of logistics activities and a toolkit for meeting corporate goals for increasing viability (Mckinnon et al., 2017; Zhu et al., 2017; Bui & Nguen, 2023; Burinskiene & Daskevic, 2024; Fan et al., 2024).

From the global picture to the homeland, research interests keep the analysis of evaluation that Bulgarian SME managers set for the importance of their logistics activities. Diagnosis of the domestic standing of logistics for small businesses directly affecting a country's macroeconomics and overall prosperity is highly important. Statistics for the relative rate of small companies and their labour importance in Bulgarian economics cover the numbers valid for the EU. In-depth acknowledgement of aspects that define business units' presentation and understanding of their practical components represent substantial synergetic factors for long-term society well-being. The supply chain analysis targets the strategic potential of customer-provider relationships and all individuals.

The focal point of this research is determining logistics within the SME environment by evaluating whether this activity has primary meaning. Being a management function, does it require a spotlight position, or is negligence less crucial than disregarding other business activities? This work aims to analyse if logistics could increase management performance. Research priority for assessing logistics importance is given to corporate outsource ratio and cost level that Bulgarian small and medium-sized enterprises experience daily.

The main task of this research is to study three main reasons for outsourcing decision-making on logistics: 1. Optimisation of company financial parameters; 2. Priority on core competencies; 3. Diversity of services for increased client satisfaction.

The statistical analysis further presented satisfactory results on the regression linear scenario, considered significant and applicable for additional analysis on logistics significance for Bulgarian SMEs.

2. Theoretical background

The last half-century was boosted with conceptual and experimental conclusions on a variety of spheres that built-in strategic business decision-making, and in place of logistics, later, supply-chain management, being primarily, or secondary, as an ingredient within that composition. Below, we mention only a few that track the main scientific pathways in the logistical theory.

Guzman-Cuevas et al. (2008) explore the economic dimensions of functional and productive dependence of SMEs. They analyse the quality of small business structure from a macro point of view. This is how they split the determinants of quality into "traditional", namely innovation, entrepreneurial collaboration, and internalisation (for elasticity and efficiency). The other group of determinants comprises functional and production dependencies. As a result of the second group, they outline two types of firms: product-makers (developing in advanced areas with relatively high income/per capita) and market-makers (establishing business in less developed regions. |Logistics provides entry to densely populated areas, abundant resource markets, fair business legislation, and, in some cases, the possibility of lower to zero taxation. Logistics, again, is crucial for any product-making and is awarded as necessary for development and growth.

Kitsios et al. (2020) state that managing logistics activities "can be a key factor" in justifying clients' needs, efficiency on an operational level, and competitiveness. Nonetheless, logistics "can pose many challenges",

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

returning the question to cost increases, the invention of more and more regulations that narrow business opportunities and the unpredictability of client demand that multiplies with global progress.

The intensive focus on Industry 4.0 during the last decade has turned our attention to the research on SMEs that enable ICT smart products. Mon and Georgio (2022) outline the "generic" functional areas of SMEs, mentioning Logistics (called Logistics Tasks) on the same level as Production, Sales, Management, and Engineering. Nuance in their research is that they split Procurement (Purchases) separately because "improvement in communication" leads to the buying cycle turning compact, thus the opportunity to offer better customer prices.

Amongst business conditions that influence the logistics outsourcing decision-making, some authors (Noskov, 2021) are keen to conclude that logistics could not be considered a core competence for small business. The fundamental point for this finds evidence within natural resource limitations of small businesses, thus lack of accessible sources to extend for logistics. On the contrary, Evangelista et al. (2017) found that due to resource limitations, logistics could mainly exist within a small business as a critical function because owners/managers and experts are forced to multitask to succeed. Yousuf (2017) claims that these polar statements do not apply to medium-sized units, but their determination of organisational size might only sometimes correspond to the EC's official classification.

Other researchers punctuate the importance of transaction costs for outsourcing decision-making. Van der Berg (2017) concludes that SMES can achieve low transaction costs for logistics, providing that their partner is enough to enjoy the economy on a scale. Magento et al. (2020) question the practical consideration of that statement and say that even exclusive logistics offers might be a big ratio in total corporate costs for micro and small companies, depending on their niche. Morrisey and Pittaway (2006) work on experimental research leading to conclusions about the overall lack of rational approach amongst managers and owners when dealing with buyer-supplier relations.

Some studies in the field of logistics management (Tamas, 2018; Yuste et al., 2019) overview multiple vectors of a sustainable supply chain for SMEs. Further investigation of the literature review endeavours to prioritise logistics business practice that allows for increased performance (Vladez-Juarez et al., 2020). Three viable areas turn the attention of researchers as focal points for small businesses presentation, namely: Competencies Scale (Martino et al., 2016; Gu et al., 2023); Services impact on Human Behavior (Fruggiero et al., 2016); and the Sustainability on Uncertainties (Fear et al., 2017; Tsao et al., 2024).

Long-term local projects based on available global research in developed and fast-developing countries on the significance of logistics for Bulgarian people and country prosperity highlight numerous unsolved issues. Some of those are shown below, standing for a conceptual base for the development of current work and formulation of research tasks filling the indicated gaps:

1. The impact of Bulgarian organisations' size on the scale of logistics cost and logistics outsourcing ratio has not been determined.
2. The impact of Bulgarian organisation size on the significance of logistics as a core competence has not been determined.
3. The leading factors for logistic outsourcing for Bulgarian SMEs have not been determined.
4. Not evaluated the relationship between Bulgarian SME's performance and the efficiency of their logistics system, regardless of their own or third origin.
5. The relative significance of logistics to other functionalities within Bulgaria SMEs was not assessed.

As a result of permanent interest in logistics, its importance, determination factors, etc., the authors of this paper propose a compiled structural model of the matrix for evaluating logistics places that managers and owners of

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

small businesses can use in real practice. In essence, the model represents a three-dimensional matrix consisting of A. low to high self-evaluation of logistics tasks for business, B. scenarios for in-house logistics and 3PLs, C. estimation for special requirements and limitations in business, and unavoidable conditions. This could be a foundation for determining their logistics policy and support business decision-making for the unit and function. One can calculate the importance of each matrix dimension and logistics standard weight through mathematical operations such as Kramer's matrix and linear equations. A designated area of the 3-D matrix cube would spotlight the parameters of business decisions for logistics. The graphic pictures shown below apply visual elements and inspiration as supported by http://biomatrixweb.com/optimal-organisational-structure/ and https://ofekshilon.com/2013/01/11/geometric-interpretation-of-a-3d-matrix-inverse/.

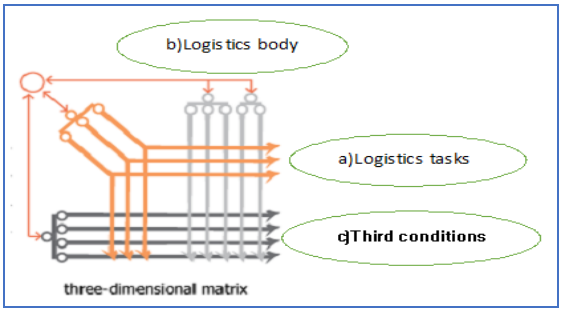


Figure 1. 3-D matrix for logistics decision-making

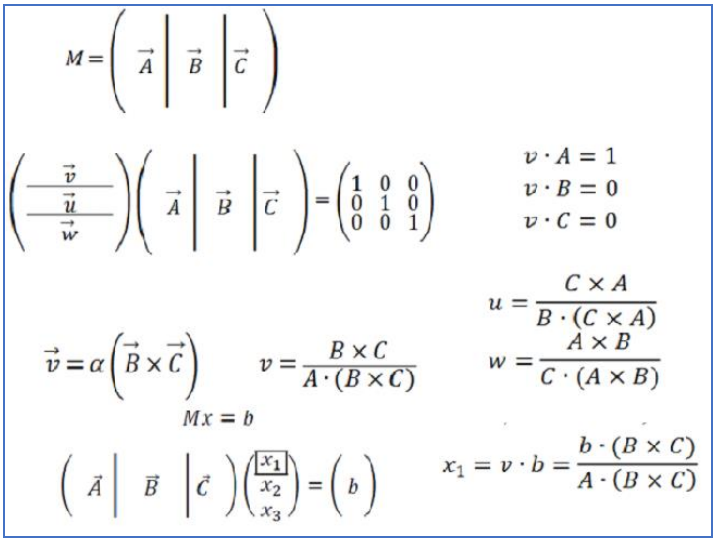


Figure 2. Calculation of matrix dimensions

Based on those findings, the paper overviews the significance of three generic determinants that outweigh and bend management alternative decisions in the direction of in-house logistics or outsourcing (random). One of these determinants is the scale of a number of financial parameters (economic efficiency, profitability, liquidity, ROE, turnover, etc.), other targets, concentration, and priorities of small business activities (core competencies). The third determinant explores the service elasticity of the small company (workability vs firmness to increase clients' satisfaction). Therefore, the main aim of further investigation is to check a hypothesis that Bulgarian SMEs outsource logistics tasks and activities seeking to directly impact three areas: financial results, production activities, and diversification of logistics services.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

3. Research goal and methodology

The current research's conceptual, methodological frame focuses on analysis and serviceable outcomes. The leading research target is the importance of logistics as a function for Bulgarian SMEs. The authors look at its viability degree and impending constructs that stimulate small businesses to make or buy logistics activities.

Balanced design for empirical determination of the targeted platform allows analysis of samples during a more extended timeframe or reasons that might implement uncertainties within the methodological construction of analysis that could not be confirmed as applicable for the entire research process (Dietrich & Edsall, 2006). This approach provides information for the repeatability of standard analysis variation and evens out noise obtained during the primary data collection. This applies to identifying between analogue microsampling to determine multidimensional apparition (Ouyang et al., 2017). The advantage of methodological balance design derives from a practical perspective and the opportunity to calculate numerous sources of data uncertainty of various origins whose values change and differ.

In summary, this project's methodological texture comprises the following: 1. Application of structural approach for verification of research methodology for exploring the importance of logistics for Bulgarian SMEs; 2. Thorough statistical analysis and quantitative research (from descriptive sample statistics to multiple linear regression), with a toolkit for validation of obtained outcome.

Research questions are responded to by obtaining research data collected through the transmission of a standardised questionnaire. Primarily data is processed. According to the research hypothesis's specifics, processing methods and instrumentation are selected to neutralise human error.

This paper is a conceptual part of broader research on the logistics role for SMEs in Bulgaria, comprising the main layers built within that are shortly described below:

Layer 1 – Analysis of logistics tasks and sub-activities that Bulgarian small businesses practice to do in-house or outsource. Primarily, I am responsible for logistics strategy and procedures for Bulgarian SMEs.
Layer 2 – Analysis of transaction and translation costs that Bulgarian SMEs calculate for logistics – relative amount of logistics costs in total company costs.
Layer 3 – Analysis of reasons for logistics outsourcing, respectively, for own logistics, considered by Bulgarian SMEs.
Layer 4 – Criteria for evaluating professional logistics providers that Bulgarian SMEs point to.
Layer 5 – Bulgarian SMEs success. Analysis of Bulgarian small companies' performance. Stakeholders and market position. Prospects for Bulgarian SMEs on domestic and global markets.
Layer 6 – Research outcome and conclusions – Place, importance and perspectives of logistics strategy for Bulgarian SMEs.

Different layers of the above structure are not mechanical mixtures and do not stand for separate or independent findings from the other layers. All layers form cumulative matter, the elements of which impact findings and conditions on rest. The focus of the current paper is the thorough determination of parameters found for discovering Layer 3 of said structure through the prism of other layers' elements. Findings in Layer 3 would support statements in Layer 6, which proves the realisation of the supreme goal of the entire project.

Although target findings require a complex approach for practical consideration and individual layer investigation, we applied the philosophy of Axiomatic Design for Products, Processes and Systems per Suh's design axioms (Brown, 2019). Shortly, it is considered that two typical particularities, called axioms, characterise the best designs.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

A1 proclaims maintenance of independence between the system's functional elements. “Independence establishes success". Besides independence and forthcoming simplicity, this axiom promotes design solutions while reducing undesirable consequences.

A2 endeavours to minimise the information size, considering the resource-consuming characteristics of big data. This also supports the potential necessity to adjust and control the initial design.

The axiomatic design approach is convenient for analysing existing layer design, for calculation opportunities for optimisation through quantitative analysis, but through the prism of innovation and creative admission, and for implementing improved changes and continuing the optimisation cycle.

Table 1. Layer 3 design for examination of logistics’ importance for Bulgarian SMEs

Target make or buy	**Considerations**	**Notes on applied statistics analysis**
Annual Return figures (**AR)**	- increased economic efficiency **EE** - not detected change in EE with or without 3PL / self-assessment **NC** - generation of uncertainty in AR, threat of hidden, indirect or additional costs **U**	1. *Descriptive statistical methodology* - Non-parametrical Analysis for determination of dispersion normality – z-tests for kurtosis and skewness, test of Kolmogorov & Smirnov, test of Shapiro & Wilk, correction of significance by Lilliefors; 2. *Analysis of measurements’ reliability* - Cronbach's alpha (Tau-reliability test score coefficient); 3. *Analysis of measurements' validity* - Analysis on factors adequacy, test of Kaiser-Meyer-Olkin, Bartlett Test of Sphericity; - Determination of factors for the sample through Factoring on Principal; - Explanation of total cumulative values on results variances through a cumulative percentage of validity of variables; 4. *Pearson correlation analysis* 5. *Regression analysis* - Multivariate linear regression; - ANOVA on multiple factors; - Corrected correlation coefficient; - Analysis on tails by Durbin-Watson; - Multicollinearity indicators for Analysis – Tolerance and dispersion inflation factor (VIF); - Standardised and non-standardised coefficients β; - Glejser test for heteroscedasticity.
Centre of Attention (**CA)**	- focus on production operations **FO** - company has its own logistics professional **LP** - lack of logistics knowledge and need for the ability **NE** - supply-chain dependency on 3PL **D3** - logistics is a key competence for the SME **KC** - no free cash for 3 PL **OC** - lost control over the logistics process, lack of feedback and difficulties in assessing the 3PL **LCF**	
Service Elasticity (**SE)**	-increased flexibility **IF** - improved customer loyalty **CL** - stakeholders’ expectations **HE** - market dynamics **MD** - lost contact with clients' **FB** - 3PL availability and parameters **AP**	

The primary research target of this paper is to explore the grounds for logistics outsourcing decision-making through the prism of the significance of logistics function in the hierarchy of strategic considerations for Bulgarian SMEs.

The research hypothesis that is targeted for verification says:
Bulgarian SMEs make rational business decisions for logistics outsourcing because of three primary considerations:
- Annual return figures AR;
- Center of Attention of their competencies CA;
- Elasticity of services for client satisfaction through flexibility SE.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Exponent constructs applied to confirm the research hypothesis in the spotlight of Bulgarian SMEs' logistics strategies correspond to the parts and elements shown in Table 1. The dependent value was confirmed through named factors. The instrument Rom for research in measuring the variables follows Babbie's components selection (1998).

This project is an in-depth analysis of factors for ranking logistics strategy in the global corporate strategy. A quantitative approach was favoured through a survey format comprising 20 constructs and recognised methods like Likert-type scales, screening and control questions. The leading philosophy for good conduct was the one of Fowler Jr: "Special purpose surveys may be the only way to ensure that all the data needed for a given analysis are available and can be related" (2014). In summary, a 4-figure number of SMEs in Bulgaria were contacted through various channels with a return rate of approximately. 18%, N=252.

4. Results and discussion

4.1. Clarifying some parameters of the sites that voluntarily participated in the study on the importance of logistics for SMEs

To study the importance and role of logistics for SMEs, an experimental survey of real businesses was conducted among micro, small and medium-sized enterprises registered on the territory of the Republic of Bulgaria and active at the time of collecting the primary empirical information. An essential condition targeted when formulating the research methodology is that the economic units participating in data collection for analysis are non-financial in the sense of the Classifier of economic activities. Also excluded from the sample are organisations that are inactive and "fictitious"; that is, in the sense of the annual tax declaration, they have not "dead" as local definition vowels and do not demonstrate zero turnover. An essential criterion for participation in the study is that the enterprise registers the presence of business operations, reflected in the General Accounting Book of the enterprise, noting movement in at least one monthly turnover report in the year preceding that of conducting the survey. When classifying the size of the economic enterprises, the research team mainly relied on the EC recommendations from 2003. However, subjects could self-categorise according to their understanding of size and refer to the secondary financial indicators for size - capitalisation and turnover. Then, small enterprises are classified as higher rarer if they are structurally determining, impact the local socio-economic situation or represent economic subjects of third importance.

In addition to the above, it should be added that enterprises that do not employ the labour market to a third party who is not the owner or manager of the same are excluded from the process of conducting the scientific research study. This criterion is set as required for two reasons: first, to confirm the participation in the study of only active enterprises; second, to increase the value of the scientific research conclusions made as something applicable and with a potential impact on the real economy among the broadest possible range of interested parties. Some specific characteristics of the research sample are summarised below, assuming that all primary informants meet the above guiding requirements.

To outline the demographic structure of the participants-respondents in the research on the importance and role of logistics for SMEs, an answer to the following questions was sought:
- What are the respondents? Number and size.
- Where are they from? Headquarters/Address of management.
- Where are they? Place of doing business, the geographical distribution of the market.
- What are they doing? Economic activity, industry, livelihood.

Some of the results of the analysis of the demographic structure of the participants-respondents are presented below.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

When filling out the questionnaires for the study of the importance and role of logistics for SMEs, the respondents were asked to indicate the localisation of their headquarters in one of the following administrative-geographical areas:

1. Southwest Bulgaria
2. South Central Bulgaria
3. Southeast Bulgaria
4. Northeastern Bulgaria
5. North-central Bulgaria
6. Northwestern Bulgaria

The results of the distribution of enterprises by the indicated areas are presented below.

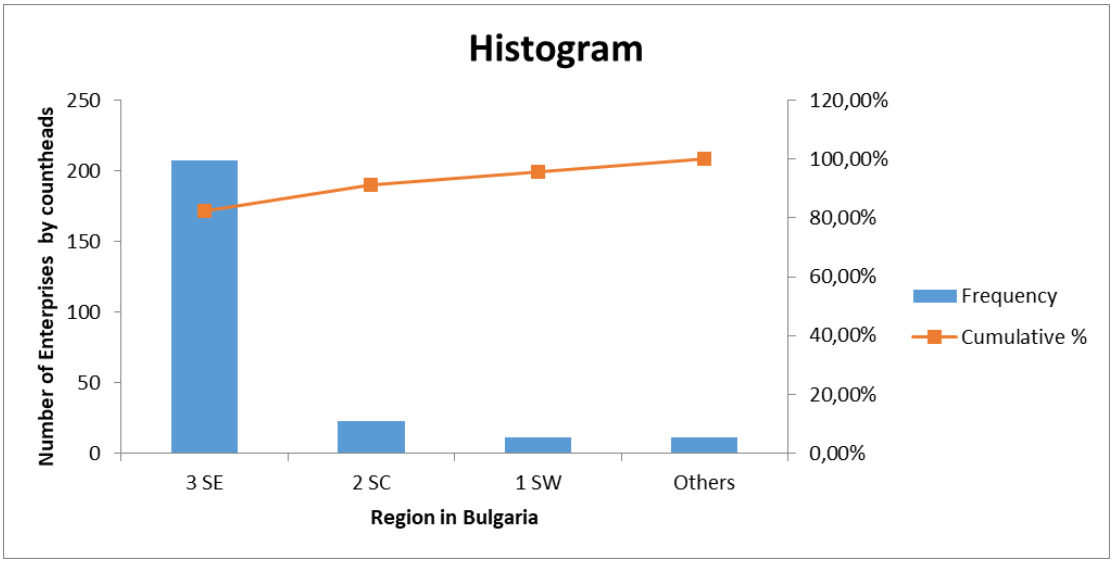


Figure 3. Administrative-geographical distribution of the headquarters of SME respondents in the study, where: 1. Southwest Bulgaria; 2. Southcentral Bulgaria; 3. Southeast Bulgaria

Table 2. The Number and Percentage Distribution of Participants

Bin	*Frequency*	*%*	*Bin*	*Frequency*	*Cumulative %*
1 SW	11	4,37%	3 SE	207	82,14%
2 SC	23	9,13%	2 SC	23	91,27%
3 SE	207	82,14%	1 SW	11	95,63%
Others	11	4,37%	Others	11	100,00%
		100,00%		252	

From the data presented, it is clear that the participants are primarily from southern Bulgaria. This is explained by the research team's access to genuine business enterprises through the positioning of residence, place of work, and choice of an educational institution. This is explained with researchers' and partners' access. However, additional analysis of the origin of the respondents proves that the sample of SMEs from the southern half of Bulgaria represents the same part of the country. The distribution of results from the statistical-mathematical calculations for localisation of the headquarters of the enterprises does not differ from the theoretical normal distribution for the so-called. "mean samples" of size in the range $50<n<300$ and at significance level $\alpha=0.05$. At $n=252$, the

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

distribution parabola has a slight negative slope with shifts to the right on the abscissa with a skewness value of minus 1.77. For a normal distribution, the amount of skew should not be greater than 2.1. With a maximum peak of the parabola on demand below 7.1, the same for the studied sample is 4.8. In addition, the lack of pronounced slope of the cumulative curve from the histogram map in Figure 3 is due to the large proportion of uniform participants, also shown by the coincidence of the mean, median and mode values in the descriptive statistics results. The table below shows the relevant statistical values of the state of the sample of respondents according to the criterion "Management address".

Table 3. Descriptive statistics of SMEs participating in the study, calculated using the dependent 'Address of Management'

Management Address	
Mean	2,865079
Standard Error	0,034068
Median	3
Mode	3
Standard Deviation	0,400815
Sample Variance	0,292481
Kurtosis	4,800845
Skewness	-1,76874
Range	3
Minimum	1
Maximum	4
Sum	722
Count	252

The questionnaire provided to the research participants about the importance and role of logistics for SMEs included a question regarding the respondents' definition of the main activity. Respondents were asked to indicate an answer among 17 options not equivalent to the Classification of Economic Activities (KID 2008). This is so for the following more important reasons:

1. Minimisation of the question, reduction of the number of options, round-up. This was done because the participants could quickly and easily navigate the answer options, not to be discouraged at the beginning of the questionnaire and to stimulate their desire for subsequent cooperation. In this way, it can gain respondents' trust and overall reduce stress.
2. The primary data from the respondents' responses can be used for comparative analysis with third-party research projects.

4.2. Descriptive statistical methodology

The research data's distribution is calculated to prove it meets the statistical requirements for normality in all tests stated in Table 1. The findings on constructs' descriptive stat values are seen in Table 2. In conclusion, it becomes clear that the results' distribution meets the normality criteria. Z-skewness and z-kurtosis are <3.29 at sig = 0.05 for mid samples (51:299); skewness <2.1; kurtosis <7.1.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Table 3. Skewness and Kurtosis of Bulgarian SMEs

Var.	N	Skewness		Zsk	Kurtosis		Zku
	Stat	Stat	SE		Stat	SE	
EE	252	,318	,189	,144	,901	,358	2,104
NC	252	,107	,189	,322	1,002	,358	2,205
U	252	,315	,189	,369	,574	,358	1,679
FO	252	,058	,189	,572	1,013	,358	1,392
LP	252	,221	,189	,225	,657	,358	2,911
NE	252	,023	,189	,279	,742	,358	2,678
D3	252	,241	,189	,483	,792	,358	2,201
KC	252	,05	,189	,124	,445	,358	1,913
OC	252	,105	,189	,126	,808	,358	1,272
LCF	252	,106	,189	,153	,981	,358	1,686
IF	252	,102	,189	,444	,792	,358	1,501
CL	252	,291	,189	,111	,742	,358	1,044
HE	252	,307	,189	,441	,153	,358	2,066
MD	252	,221	,189	,225	,657	,358	2,911
FB	252	,023	,189	,279	,742	,358	2,078
AP	252	,241	,189	,483	,792	,358	2,201
Valid N	252						

Table 4. Normality of Bulgarian SMEs Sample

	Kolmogorov & Smirnov (a*)			Shapiro & Wilk		
	Stat	df	Sig	Stati	df	Sig
EE	,462	252	,000	,311	252	,000
NC	,511	252	,000	,354	252	,000
U	,419	252	,000	,402	252	,000
FO	,500	252	,000	,421	252	,000
LP	,477	252	,000	,234	252	,000
NE	,452	252	,000	,367	252	,000
D3	,354	252	,000	,368	252	,000
KC	,467	252	,000	,437	252	,000
OC	,471	252	,000	,381	252	,000
LCF	,451	252	,000	,297	252	,000
IF	,502	252	,000	,461	252	,000
CL	,477	252	,000	,237	252	,000
HE	,453	252	,000	,365	252	,000
MD	,462	252	,000	,345	252	,000
FB	,512	252	,000	,452	252	,000
AP	,443	252	,000	,373	252	,000

(a*). Lilliefors Significance Correction

The Kolmogorov and Smirnov and Shapiro and Wilk tests demonstrate that the null hypotheses root for a sample whose population is normally distributed statistically. The results are in Table 4. Performed tests gain significance value <,05. Nonetheless, researchers refer to the axiom in The Central Limit Theorem. The theory concludes that an increase in the size of samples leads to confirmation of its normality, which is valid and applicable to any population. This means that the more considerable data increases its sustainability in violations of stat normality. Therefore, obtained sample parameters are evenly distributed and could be considered for further processing of set parametric values.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

The conceptual approach for calculating the dependent variable by applying the philosophy behind the Relative Importance of Factors of Sambasivan & Yau (2007) aims to invent exponents to assess the targeted dimension. For this purpose, we created two 3-point Likert scales with non-numerical values to obtain the respondents' self-assessments. Respondents were asked to select a positive option, later equal to 2 for calculations; a negative option, equal to 1, or a neutral choice = 2. Neutral choice is connected to a lack of knowledge, perception or understanding of the matter on behalf of the respondent. Running a micro business, where the owner usually serves as a manager and even an operation, is a matter that could include a lack of a professional management approach. Therefore, those responses are ranked as 2, heavier than the negative option, because it was unclear whether criteria existed. That was for the aim of not missing a show.

We could compute a dimension called the author *Gauge Commutable Value* (GCV) based on the information we obtained. For each variable, we measured the GCV through the formula GCV = sum(n-construct . weight by respondent) divided by (number of participants . value of the positive response). The amount of GCV is in the scope (0÷1), and to follow the original conception, results closer to 1 (higher) demonstrate increased importance and impact strength.

The GCV was numerically valued for the leading logistics strategy factors (Targets Make or Buy): AR, CA, and SE. All Considerations were individually assessed. Findings are demonstrated in Table 5. 16 factors have been experimentally selected to result in practical tool value that can be invented for logistics decision-making in Bulgarian SMEs' genuine business. For each GCV we computed its value V, and mean M.

Table 5. GCV and Analysis of Factors for the Logistics Strategies of Bulgarian SMEs

Matrix of Factors					
Considerations	Target			GCV	
	AR,	CA	SE	V	M
EE	,722			**,847**	**4,803**
NC	,489			,586	3,002
U	,587	,389		,623	3,669
FO	,469	,779		**,651**	**3,569**
LP				,589	3,026
NE				,421	2,899
D3	,802			,718	3,908
KC			,663	,688	4,098
OC	,784		,148	,556	4,046
LCF	,452	,129		,562	3,915
IF	,337		,670	**,602**	**4,001**
CL	,511			,556	3,724
HE	,454		,129	,553	3,862
MD	,559	,677		,559	3,762
FB	,452			,603	3,569
AP	,357			,702	3,753

Calculated figures show that the highest GSV is given to Increase in Economic Efficiency = 847.
Next, Bulgarian SMEs appear to consider their Focus on Production Operations with GCV = 651.
Top Three closes the Increase in Services Flexibility for SMEs when selecting a 3PL partner (602).

Cronbach's α test is generally used to confirm data statistical consistency. The estimated value of Cronbach's α is supposed to be high because that eliminates calculation errors caused by inconsistency. High Cronbach's α is also a mark for data homogeneity. Researchers usually find difficulties in extracting high α for less than 10 constructs.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

For that matter, any result rounding 0.5 is regarded as acceptable. Cronbach's α based on Standardised Items for current research was calculated 0.526.

Reliability determines the internal consistency amongst items, and it was approved by computing Cronbach's alpha, analysis of validity and verification of the adequacy of factor analysis by Kaiser-Mayer-Olkin test and Bartlett's test of Sphericity were conducted to approve verification of received results.

Analysis on factors adequacy, test of Kaiser-Meyer-Olkin, test for Bartlett's sphericity further approve that collected research data is applicable for additional processing for statistical values.

Table 6. Adequacy Verification of Factors for Bulgarian SMEs

Kaiser-Meyer-Olkin Sampling Adequacy		0,677
Bartlett's Sphericity	App. x-Sq	111,923
	df.	16
	Sig	.000

KMO needs to exceed the value of 0.5, while Bartlett's Sig. is expected to show below 0.05. The exact numbers for this research are available in Table 6.

4.3. Correlation analysis for Bulgarian SMEs' logistics strategies determinants

For reliable calculation of Pearson correlation between Bulgarian SMEs' logistics strategies and their primary target, this research compiled the following supportive analysis: a. test of alternative hypotheses; b individual respondents survey overview; determination of the companies location and market share – domestic and global; c. past, present and future business prospects (based respondents shared data); d. global and local socio-economic conditions during the entire research period, being episodic, repetitive, or permanent; side statistics on tests, e.g. Mann-Whitney U-, and Kruskal-Wallis (one-way ANOVA for non-parametric probability sample distribution); e. calculation on stochastic domination of sub-samples, etc. We can conclude that the stated working hypothesis is confirmed. Findings are demonstrated below.

Table 7. Pearson Correlation Logistics Strategy: Targets

		AR	CA	SE
LS	Pearson Correlation	,699**	,462**	,648**
	Sig, (2-tailed)	,000	,000	,000
	N	252	252	252

Table 8. Pearson Correlation Targets: Top GCV Considerations

		AR	CA	SE
EE	Pearson Correlation	,804	,220	,502
	Sig, (2-tailed)	,005	,004	,031
FO	Pearson Correlation	,403	,991	,299
	Sig, (2-tailed)	,009	,763	,077
IF	Pearson Correlation	,438	,182	,531
	Sig, (2-tailed)	,602	,121	,000
N		252	252	252
**Significant Correlation at ,01 l 2-tailed * Significant Correlation at ,05 l 2-tailed				

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Based on further GCV analysis, it can be concluded that among influential determinants for logistics strategies considered by Bulgarian SME respondents, the direction of outsourcing their logistics activities, increased marked of professional logistics providers, boosting area economics through cooperation, and stretching their services elasticity to more opportunities for customers, are:
1. Regarding SMEs' needs and focus. The clear frame of a contractual offer.
2. Feedback and Proposals. Shared know-how for customer service. Support in-house logistics tasks. Timesaving practices.
3. Added value through increased partner package. More practical options for customers.

4.4. Regression analysis for Bulgarian SMEs' logistics strategies determinants

A multivariate linear regression analysis is performed to assess and determine the influence of Bulgarian SME targets on their logistics strategy. The variables are set as predicted values. For this research, it is stated that Targets to Make or Buy Logistics (TMBL), declared by respondents as provided, directly impact Small Business Logistics Strategies. The results obtained as an outcome of the study are demonstrated further. Overall, coefficients confirmed a strong positive relationship between the direction of logistics strategies and values of the Bulgarian SME main Considerations per Target. ANOVA p-value strikes .000.

Table 9. Determination Coefficients

Model Summary				
Model	R	R Square	Adjusted R Square	Std, Error of the Estimate
1	,814[a]	,476	,411	,41104
a, Predictors: (Constant), SMEs Consideration per Target b, Dependent Variable: SMEs Logistics Strategy to Buy or Make				

Table 10. Variance and Level of Significance

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig,
Regression	4,374	6	1,462	8,546	0,000[a]
Residual	4,745	246	0,169		
Total	8,888	252			
a, Predictors: (Constant), SMEs Consideration per Target b, Dependent Variable: SMEs Logistics Strategy to Buy or Make					

Table 11. Multicollinearity and Coefficient of Regression

Coefficients							
	Unstandardised Coefficients		Standardised Coefficients			Collinearity Statistics	
Model	β	Std, Error	Beta	t	Sig,	Tolerance	VIF
(Constant)	,38	,685		,056	,956		
TMBL	,002	,000	,614	4,386	,000	,648	1,542
a, Dependent Variable: SMEs Logistics Strategy to Buy or Make							

Based on these findings, one can output the formula for the nonlinear regression equation:

$\hat{y}$ - const.

$\hat{y} = \beta +$ sum(βVariables)

$\hat{y}$ = 0.38 Const + 0.002 TMBL

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Durbin-Watson's tests on residuals exceed 4, which strongly indicates that residuals appearing with stochastic character are considered to result in reasonable matters. Multicollinearity indicators supporting the analysis of variables' self-excluding capability passed calculation through the Tolerance and VIF indicators. Multicollinearity existing between independent variables is present for Tolerance < 0.01 and VIF >10. The dependent variable is a statistically significant element of the model level <0.05. The outcome of the tested sample concludes that the multicollinearity between the independent variables is acceptable according to the results of Tolerance and VIF. The linear regression values are statistically significant and applicable for genuine business and scientific use for planning and predicting. The model satisfies the required statistical estimates.

The unstandardised coefficient β for TMBL = 0.002 is a value that supports the exact mathematical calculation for changes in logistics strategy for Bulgarian SMEs. Every increase in the parameters of Targets to Make or Buy Logistics directly impacts changes in the small company's logistics strategy, with a multiplication of 0.002%. The standardised coefficient demonstrates respectively the standard deviation of this percent. Therefore, it could be calculated that there is a 95% confidence interval that any unit change in SMEs TMBL would directly impact the logistics strategy of that Bulgarian SME and influence its importance in range (- ,054 % decline: +,058% increase). The minus value demonstrates that despite the positive, strong probability, the reason underlying any possible decline might be of third origin and requires additional check-ups and selection of variables. An analysis is to be processed anew.

The assumption of researchers that the standard square deviation of analytical data possesses a set value for all analysed elements, scientists accept that the analysis error variance is constant. That is not valid for data categorised as heteroscedastic, i.e., demonstrated apparent variance. Variance errors are proven to increase when Errors may increase when the Predictor (SME consideration per Target) multiplies. On the other hand, the analysis of the dependent variable/s (SMEs Logistics Strategy to Buy or Make) also shows heteroskedastic error when the SMEs Logistics Strategy to Buy or Make has high significance. That indicates that SMEs' Consideration per Target is a necessary but insufficient (not the only one) condition for the value of SMEs' Logistics Strategy to Buy or Make. Whenever a high value for SME consideration per Target plays such a role in observing the respective high values of SMEs' Logistics Strategy to Buy or Make, heteroscedasticity is likely to present. The assessment of heteroscedasticity is presented in Table 12.

Table 12. Heteroscedasticity of Model

Coefficients					
	Unstandardised Coefficients		**Standardised Coefficients**		
Model	**β**	**Std, Error**	**β**	**t**	**Sig,**
(Constant)	3,570	1,184		2,855	,006
TFFA	,031	,076	,073	,398	,712
a. Dependent Variable: SMEs Logistics Strategy to Buy or Make					

As per Glejser's assessment, the heteroscedasticity check of the independent variables is controlled for the tested sample (Predictor SMEs Consideration per Target p-value > 0,05).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Conclusions

The significant and challenging role of logistics has been of constant interest to researchers. In this study, authors extend the investigation for evaluation of logistics importance for small businesses in Bulgaria – a country enjoying turbulent business conditions due to limitations, geopolitics, global medical issues, being a second-decade part of the EU, and still lagging behind the leading economics within the community.

Diagnosis of logistics perceptions of Bulgarian business is significant due to its direct impact on local development. Situated on a geographical crossroads, Bulgaria acts as a stopover point for the business flow, which is of international importance. Therefore, the findings in this research can serve as a starting point for activities with a holistic impact on improving Bulgarian business setup, thus performing a gradual but confident effect on local, area, and continental prosperity.

This long-term project focuses on country business specifics in the field of logistics, paying attention to the determination of Bulgarian small businesses specifics. On site of logistics costs resulting in the necessity for SMEs to assess two major fields, Bulgarian entities differ in the tendency to outsource their logistics activities. The position of logistics in the hierarchy of the business functionalities for Bulgarian SMEs served as another leading point in examining the importance of logistics for Bulgarian SMEs' business strategies.

As part of more comprehensive scientific research, this paper demonstrates analytical findings on why Bulgarian small businesses consider outsourcing logistics tasks to establish their own logistics structure. This research approved three main reasons for logistics outsourcing decision-making for Bulgarian SMEs: optimisation of financial performance (gain/loss outcome), focus on business tasks due to source limitations, and flexibility of service options for customer satisfaction. Based on that, three targets for Bulgarian SMEs to "Make or Buy Logistics" were set, with appropriate considerations for each target. The leading considerations for each target were excelled, and thorough factor analysis was performed.

Clarification of some site demographic and statistical parameters describes local specifics of this investigation on logistics importance in Bulgaria. The specific characteristics of the Bulgarian SMEs that participated in this research reveal conditional determinants that could help entrepreneurs in planning but also could serve as a comparison in analogue analysis.

In the research process, the authors compiled and computed a dimension named Gauge Commutable Value (GCV). GCV was calculated for each research variable and numerically valued for each leading factor and all respective considerations. Additionally, the correlation between the three business targets of the Bulgarian SMEs and their logistics strategy was assessed, with extended correlation analysis on the Top Three GCV considerations. These quantities could be promoted in various aspects of future research in the business field.

Researchers developed a multivariate linear regression model and assessed and determined the influence of Bulgarian SMEs' targets on their logistics strategy. The variables were set as predicted values with defined numerical quantities. Strong positive relations were approved in the sense of Targets to Make or Buy Logistics, which directly impacts small business logistics.

The concepts, models, formulas, and exact solutions derived from scientific tools are proposed in this paper, whose transfer in education, science, and business can find direct and immediate application in real economics and beneficial fields for training and further research. The overall positive effect on people and the country's prosperity could be deduced here.

References

Babbie. E. (1998). The Practice of Social Research. Wadsworth Publishing Company. 1998. ISBN 053450468X. 978053450687.

Brown, C.A. (2019). Axiomatic Design for Products. Processes and Systems. in: Industry 4.0 for SMEs – Challenges. Opportunities and RequirEMEnts. ISBN:978-3-030-25425-4. pp 383-402. https://doi.org/10.1007/978-3-030

Burinskiene, A., & Daskevic, D. (2024). The Investigation on the Application of Digital Technologies for Logistics Business Competitiveness. *Tehnicki Glasnik-Technical Journal*, 18(4), 626-637. http://doi.org/10.31803/tg-20230922182645

Bui. L. D. & Nguyen. H. T. D. (2023). Factors influencing the decision to outsource logistics services of small- and medium-sized enterprises in Vietnam. *Journal of International Economics and Management*, 23(1), 106-118. https://doi.org/10.38203/jiem.023.1.0064

Deitrick, S., & Edsall, R. (2006). The Influence of Uncertainty Visualisation on Decision Making: An Empirical Evaluation. In: Riedl, A., Kainz, W., Elmes, G.A. (eds) Progress in Spatial Data Handling. Springer, Berlin, Heidelberg https://doi.org/10.1007/3-540-35589-8_45

Evangelista. P., Santoro. L., Hallikas, J., Kahkonen, A.K., & Lintukangas. K. (2019). Greening Logistics Outsourcing: Reasons. Actions and Influencing Factors. InderScience, 269-296. https://doi.org/10.1504/ijlsm.2019.103084

Fan, M.Y., Tang, Y., Qalati, S.A., & Ibrahim, B. (2024). Can logistics enterprises improve their competitiveness through ESG in the context of digitalisation? Evidence from China. *International Journal of Logistics Management* http://doi.org/I10.1108/IJLM-05-2023-0216

Fera, M., Fruggiero, F., Lambiase, A., Macchiaroli, R., & Miranda, S. (2017). The role of uncertainty in supply chains under dynamic modeling. *Int. J. Ind. Eng. Comput*, 8, 119-140. https://doi.org/10.5267/j.itec.2016.6.003

Fowler, F.J. (2014). Survey Research Methods. Fifth Edition. Boston (Sage Publications Inc.)

Fruggiero, F., Riemma, S., Ouazene, Y., Macchiaroli, R., & Guglielmi. V. (2016). Incorporating the Human Factor within Manufacturing Dynamics. *IFAC-PapersOnLine*, 49, 1691-1696. https://doi.org/10.1016/j.ifacol.2016.07.825

Gu, X.B., Chan, H.K, Thadani, D.R., Chan, F.K.S., Peng, Y. (2023). The role of digital techniques in organisational resilience and performance of logistics firms in response to disruptive events: Flooding as an example. *International Journal of Production Economics*, 266, Article Number 109033 http://doi.org/10.1016/j.ijpe.2023.109033

Guzman-Cuevas, J., Caceres-Carraso, R., & Sorano. D.R. (2009). Functional Dependance and Productive Dependance of SMEs. *Small Business Economics*. Springer Link, 32. 317-330. 2009. https://doi.org/10.1007/s11187-008-9115-0

Kitsios, F., Kamarioton, M., & Madas, M.A., Fosnkas, K., & Manthou, V. (2020). Information Systems Strategy in SMEs: Critical factors for Strategic Planning in Logistics. *Kibernetes*, 49(4), 1197-1212. https://doi.org/10.1108/K-10-2018-0546

Lu, H., & Shaharudin, M.S. (2024). Role of digital transformation for sustainable competitive advantage of SMEs: a systematic literature review. *Cogent Business & Management*, 11(1), Article Number 2419489 http://doi.org/10.1080/23311975.2024.2419489

Mageto, J., Prinsloo, G., & Like. R. (2020). Determinants of Logistics Outsourcing Performance among Small and Medium Enterprises. *International Journal of Logistics Systems and Management*, 35(4), 541-565. https://doi.org/10.1504/ijlsm.2020.106261

Martino, G., Fera, M., Iannone, R., & Miranda, S. (2016). Supply Chain Risk Assessment in the Fashion Retail Industry: An Analytic Network Process Approach. *Int. J. Appl. Eng. Res*., 12, 140-154.

Mckinnon, A. (2017). Integrated Logistics Strategies". Brewer. A.M.. Button. K.J. and Hensher. D.A. (Ed.) Handbook of Logistics and Supply-Chain ManagEMEnt (Vol. 2). Emerald Group Publishing Limited. Leeds, pp. 157-170. https://doi.org/10.1108/9780080435930-010

Mon, A., & del Georgio, H.R. (2022). Technological Transformation Model for SMEs. 4th International Conference on Industry 4.0 and Smart Manifactory. Elsevier B.V. https://doi.org/10.1016/j.procs.2022.12.306

Morrissey, W, & Pittaway, L. (2006). Buyer-Supplier Relationships in Small Firms. The Use of Social Factors to Manage Relationships. *International Small Business Journal*, 24. 272-298. https://doi.org/10.1177/0266242606063433

Noskov, S.V. (2021). Logistics Outsourcing Efficiency. In: Ashmarina. S.I.. Mantulenko. V.V. (eds) Digital Economy and the New Labor Market: Jobs. Competences and Innovative HR Technologies. IPM 2020. Lecture Notes in Networks and Systems. vol 161. Springer. Cham. https://doi.org/10.1007/978-3-030-60926-9_76

Ouyang, Q., Wu, C., & Huang. L. (2017) Methodologies. Principles and Prospects of Applying Big Data in Safety Science Research. https://doi.org/10.1016/j.ssci.2017.08.012

Sambasivan, M., & Yan, W.S. (2007). Causes and Effects of Delays in Malaysian Construction Industry. *International Journal of Project Management*, 25(5), 517-526. https://doi.org/10.12691/ajcea-3-1-3

Tamas, P. (2018). Innovative Business Model for Realisation of Sustainable Supply Chain at the Outsourcing Examination of Logistics Services. *Sustainability*, 10(1), 210. https://doi.org/10.3390/su10010210

Tu, X.J., Li, Z.F., Wu, M.L., & Yan, R.Y. (2023). Analysis on technical structure and competitiveness of ICT manufacturing industries. *China Communications*, 20(3), 361-374. http://doi.org/10.23919/JCC.2023.03.024

Tsao, Y.C., Barus, F.A.S., Vu, T.L., Sari, G.P. (2024). Evaluation of sustainability and technological management for Logistics 4.0. *International Journal of Logistics-Research and Applications* http://doi.org/10.1080/13675567.2024.2411392

Valdez-Juarez, L., Ramos-Escobar, E., & Ruiz-Zamora, J.A. (2020). Open Innovation and CSR. Determinants in Logistics and Performance in Commercial SMEs. *International Business Research*, 13, 50. https://doi.org/10.5539/ibr.v13n2p50

Van Den Berg, R., De Langen, P.W., & Van Zuijlen, P.C. (2017). Revisiting port pricing; a proposal for seven port pricing principles. *WMU J Marit Affairs*, 16, 421-438. https://doi.org/10.1007/s13437-017-0127-y

Yousuf, A. (2017). Transaction Costs: A Conceptual Framework. *International Journal of Engineering and Management Sciences*, 2(3). https://doi.org/10.21791/IJEMS.2017.3.13

Yuste, P., Campbell, J., Canyon, D., Childers, M., & Ryan, B.J. (2019). Synchronised Humanitarian. Military and Commercial Logistics: An Evolving Synergistic Partnership. *Safety*, 5(4). https://doi.org/10.3390/safety5040067

Zhu, W., Ng, S.C.H., Wang, Z., & Zhao, X. (2017). The role of outsourcing management process in improving the effectiveness of logistics outsourcing. *International Journal of Production Economics*, 188, 29-40. https://doi.org/10.1016/j.ijpe.2017.03.004

Funding: This research was funded by Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Project NIH 485/2023

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request.

Author Contributions: The authors contribute equally. All authors have read and agreed to the published version of the manuscript.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p6775548395

Ivan DIMITROV is a Professor Dr in the Department of Economics and Management. Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Research interests: Strategic Management. Operations and Supply Chain Management.
ORCID ID: https://orcid.org/0000-0003-4653-8634

Emanuila ANTONOVA is a PhD student in the Department of Economics and Management. Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Research interests: Strategic Business of SME. Significance of Logistics and Supply Chain Management for SME.
ORCID ID: https://orcid.org/0000-0002-3349-4241

Adile DIMITROVA is an Assoc. Prof. Dr. Department of Economics and Management. Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Research interests: Strategic Management. Operations and Supply Chain Management. Leadership. Human Resource Management.
ORCID ID: https://orcid.org/0000-0002-5883-1478

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY),
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Publisher
http://jssidoi.org/esc/home

INVESTMENTS IN INDUSTRY 4.0

Ondřej Peclinovský [1], Robin Kunju Mol Raj [2], Harinaraynan Kayathingal [3]

[1,2,3] *Institute of Technology and Business in České Budějovice, Okružní 517/10, 370 01 České Budějovice, Czech Republic*

E-mails:[1]*33495@mail.vstecb.cz; *[2]*robin@mail.vstecb.cz; *[3]*hari@mail.vstecb.cz*

Received 15 July 2024; accepted 7 November 2024; published 30 December 2024

Abstract. The paper examines the major factors influencing business decisions to invest in Industry 4.0 technologies and identifies the key barriers preventing businesses from entering this era. The article analyses various aspects of Industry 4.0, including its development, impact on sustainability, and approach to technology implementation. Particular attention is paid to the importance of investments in Industry 4.0 and the benefits and challenges examined in detail. The research aims to provide an overview of the status and trends in Industry 4.0 and identify important factors and barriers that affect the successful adoption and implementation of these technologies. The paper provides a new perspective on the transformation of manufacturing activities and suggests a basis for a deeper understanding of the role of Industry 4.0 in the current and future business environment. This analysis focuses on assessing previous investments in technology and innovation made by five selected Czech companies and their impact on the success or failure of their corporate strategies. The research focuses on the identification and detailed analysis of specific companies operating in the South Bohemia region of the Czech Republic. For this purpose, publicly available information on the costs and depreciation of these companies is used, as well as the collection of promotional materials, including brochures and documents available from the official websites of each company. Overall, the study provides a deeper understanding of the factors and barriers related to Industry 4.0 investments and their impact on corporate decision-making and strategies.

Keywords: Industry 4.0, investment; innovation; technology; digital transformation

Reference to this paper should be made as follows: Peclinovský, O., Kunju Mol Raj, R., Kayathingal, H. 2024. Investments in Industry 4.0. *Entrepreneurship and Sustainability Issues*, 12(2), 243-261. http://doi.org/10.9770/x5537493962

JEL Classifications: E22, G11

1. Introduction

Industry 4.0 represents a revolutionary change in how companies produce, manage, and optimise their products and services. New technologies are rapidly changing the structure of the economy and social life. This phenomenon requires continuous innovation and technological development in any company (Durana et al., 2019). Organisations can transform their business and create more value by adopting the initiatives of Industry 4.0 (Tostes & Azevedo, 2024). New technologies change the entire corporate value chains within Industry 4.0, Work 4.0, Education 4.0, and Thinking 4.0 (Dvořáková et al., 2021). Quality 4.0 is an emerging concept that is reconsidering the adoption of digital quality management (Saihi et al., 2021). Industry 4.0 is a technological framework and policy initiative that emerged in Germany in 2010 (Da Roit & Iannuzzi, 2022). According to Oláh et al. (2022), Industry 4.0 has become the most important tool companies can use to improve their business. From the first industrial revolution, which began with the invention of the steam engine to Industry 4.0, each industrial revolution resulted in a technological and economic paradigm shift (Chakraborty et al., 2023).

According to Bičo Ćar et al. (2023), the pace at which new technologies emerge is unbelievable. Their findings indicate that the management of companies must assess the company's preparedness for adopting and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

implementing these new technologies. Alper et al. (2023) distinguish four phases of industry development. The first industrial revolution, starting in the 18th century, used water and steam power for mechanisation. This was followed by the Second Industrial Revolution, during which electricity began to be used for mass production. The third industrial revolution was in the 1970s, characterised by introducing electronic and information technologies. The dawn of the 21st century saw the emergence of Industry 4.0, characterised by the implementation of various modern automation systems and digital software.

Each of these four industrial revolutions saw an increase in the productivity and efficiency of corporate production processes (Bueno et al., 2023). The new industrial paradigm, the fourth industrial revolution, brings about digital transformation, automation, and the interconnection of equipment and processes (Skare et al., 2024a). Investments in Industry 4.0 are thus becoming the critical factor for companies that want to remain competitive and bring innovative solutions to the market. The important thing is to incorporate sustainable practices to improve economic, social, and environmental sustainability (Nirmal & Reddy, 2024; Skare et al., 2024b,c). Papouskova et al. (2020) argue that increasing continuous safety and quality requirements primarily affects competitiveness. According to Shen et al. (2023), the primary goals of sustainability include reducing the consumption of non-renewable resources, minimising waste, and creating a healthy and productive environment. Butollo et al. (2023) state that the issue of investments in Industry 4.0 is highly topical today, becoming even a necessity. The shift towards Industry 4.0 was gradual. The extraordinary circumstances of the pandemic have led to significant investments widely interpreted as a digitalisation push (Olah et al. 2021; Skare et al. 2023).

According to Rawat et al. (2023), Industry 4.0 provides answers to such challenges through advanced technologies, such as the Internet, artificial intelligence, robotics, big data, etc. This evolving technology is expected to positively impact industry, economy, and society, which should lead to the development of a model innovation business and increased production. Ye et al. (2023) assume that digital investments will achieve mutually beneficial economic growth and environmental protection conditions. Cirillo et al. (2023) state that while some companies have already started to invest in modernising their production processes and infrastructure, some companies still need to be more confident. It shall be noted that investments in Industry 4.0 are not short-term but rather long-term future trends. This paper examines the importance of investments in Industry 4.0 and analyses the benefits and challenges it brings. A more detailed look at this issue shows that investments in Industry 4.0 can potentially change how production and industry development are perceived. New digital technologies are shaping the transformation of production activities. Fatima and Ali (2023) state that as the world moves towards optimised production strategies, third-world countries are also making efforts to contribute to this smart manufacturing approach.

This paper aims to analyse the major factors affecting corporate decision-making on investments in Industry 4.0 technologies and identify the key barriers preventing companies from entering this era. To this objective, the following research questions are formulated:

RQ1: What is the correlation between the development of personnel costs per employee and net income per employee of the selected companies in the years 2016 – 2022?

RQ2: What is the correlation between the depreciation of fixed assets per crown of net income and the development of sales-per-employees in the selected companies in the years 2016 – 2022?

2. Literature Review

According to Khlil et al. (2023), adopting new technologies may pose a challenge to organisations, including considerable investments in hardware, software, or human capital. The adoption of Industry 4.0 attracts manufacturing companies but also has barriers to its implementation, such as substantial investment costs or lack of qualified labour and infrastructure, causing many companies to hesitate to implement (Cornejo-Velazquez & Clavel-Maqueda, 2023). The RIL-INAPP survey collected information about the implementation of Industry 4.0 technologies. The issue of investments in new technologies in 2015–2017 was addressed with a specific question: "Did the company invest in the following new technologies in 2015–2017?" Respondents

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

were offered three options: robotics, big data analysis, augmented reality, cyber security, and Internet of Things. The Internet of Things (IoT) is a technology intended for the real-time processing of big data volumes with maximum effectiveness (Jarašūnienė et al., 2023). Within the survey, it was possible to choose multiple options. Cirillo et al. (2023) showed that all companies involved were eligible for the program, and they automatically received an incentive if they invested.

Figure 1 shows uneven distribution patterns of adoption, with less than 40 % of companies with at least 5 employees declaring that in the years 2015–2017, they made at least a single investment in Industry 4.0 technologies.

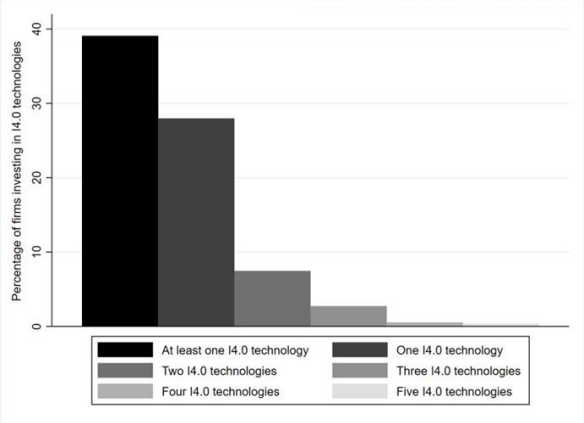


Figure 1. Italian companies investing in Industry 4.0 in the years 2015-2017

Source: The adoption of digital technologies: Investment, skills, work organisation, 2023

Another survey focused on developing the transition framework of Industry 4.0 in Tanzanian manufacturing industry. Maganga and Taifa, (2022) used a survey method to identify practitioners' perspectives. This method included open and closed structured questionnaires to assess the respondents' perception of Industry 4.0 and manufacturers' preparedness to transition to Industry 4.0. The study aims to adopt non-probability and purposive sampling strategies, focusing on fifteen Tanzanian manufacturing sectors. The data were subjected to quantitative and qualitative analysis using MAXQADA 2020 and Minitab 20. The findings confirmed a high awareness of Industry 4.0 among employees in the Tanzanian manufacturing sector, acquired, e.g., through work experience, quality training, the Internet, and reading. The results also showed that most manufacturing companies in Tanzania use Quality 3.0 or a lower approach to quality management but are prepared to adopt Quality 4.0 as practitioners see its advantages, including customer satisfaction, product and process improvement, etc. The obstacles hindering the adoption of Quality 4.0 in Tanzania include the requirement for reliable electricity supply and high-speed Internet, a qualified workforce, or insufficient infrastructure (Maganga & Taifa, 2022).

Industry 4.0 has great potential in manufacturing. Examples can be data-driven optimisation of individual machine production processes, driverless transport systems, and assistance systems. However, companies are still hesitating whether to invest in the implementation of Industry 4.0. Joppen et al. (2023) show that one of the causes might be its unclear financial benefits. Another study identifies the major challenges in adopting Industry 4.0 in the Indian construction industry. Several key challenges were identified based on available literature and personal interaction with construction management, IT experts, and academicians. The study shows that high investments and costs incurred for mobilisation with the support of the Internet of Things (IoT) in construction companies represent the main barriers to adopting Industry 4.0 methods. Another major obstacle in achieving this goal is recruiting experts for employee training, as among lower-level workers, there is a lack of basic understanding of computer use (Singh et al., 2023).

The study by Ferreira et al. (2023) aimed to analyse the benefits of the implementation of digital technologies to support environmental and social sustainability in European multinational corporations. A research model involving five digital technologies (artificial intelligence, cloud computing, robotics, big data analysis, and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

blockchain) and sustainable environmental and social practices was created. The results show that the implementation of digital technologies in business models of European multinational corporations is still at a low level. Digital technologies also positively affect these companies' social and environmental sustainability (Ferreira et al., 2023; Simionescu et al. 2021, 2022). Digital technologies within Industry 4.0 in agribusiness enable traditional agricultural systems to move towards Agriculture 4.0. The study identified digital technologies that best relate to agribusiness, obstacles in implementing these technologies, and the effect of open innovations on improving agribusiness competitiveness. The results show that the Internet of Things (IoT) is the most pronounced technology of Industry 4.0. The main barrier is the lack of knowledge and advanced skills, which indicates the need for investment in operator training (Silva et al., 2023).

The study by Trianni et al. (2024) aims to examine various fields within Industry 4.0 and energy productivity in Australia. The study analyses the technologies and services of Industry 4.0, barriers within Industry 4.0 to energy productivity, regulatory framework, multiple benefits of Industry 4.0 technologies, relevant business models, and the roadmap to Industry 4.0. The findings showed that insufficient IT infrastructure, cybersecurity, complex supply chain and contracting, and uncertainty about Return on Investment (ROI) represent the major barriers. In terms of productivity benefits, the study highlighted the macroeconomic impact, impact on the industrial sector, the public budget, health, and welfare, as well as the impact on energy supply resulting from Industry 4.0 technologies (Trianni et al., 2024). The study by Cardoso et al. (2023) aimed to examine the relationship between Industry 4.0, AI (artificial intelligence), and sustainability by highlighting the direct and indirect links between these concepts. The study shows that adopting digital approaches can significantly improve the sustainability of production systems, provided the right balance is struck. This requires investments in technology and sustainability measures to achieve a holistic, globally sustainable production system. The study thus concludes that manufacturers must continue to invest in innovative technologies, including AI and Industry 4.0 while ensuring that these investments are aligned with their sustainability goals (Cardoso et al., 2023).

The aim of the research by Ocakci et al. (2023) was to provide insight into the impact of the unique capabilities of the fourth industrial revolution on the production and maintenance tasks in terms of providing support to existing manufacturing companies by recommending areas and tasks with high potential. The research methods include survey and literature research. The survey collected empirical data using a semi-structured questionnaire, which provided a broad overview of the company's current state in terms of production and maintenance. This led to more complex and specific information on the study topics. The study indicates that implementing Industry 4.0 technologies increases production, asset utilisation, quality improvement, and organisational competitiveness (Fasuludeen Kunju et al., 2021). For companies to operate competitively, efficiently, and cost-effectively, it is important to continuously optimise capacity planning. In this context, developments in the field of Industry 4.0 have become increasingly important in recent years (Ocakci et al., 2023; Skare et al. 2024d).

Another study analysed the barriers to adopting Industry 4.0 in Indonesian manufacturing supply chains. First, a qualitative study was conducted based on interviews. Next, companies were addressed using filter questions about the adoption of Industry 4.0 and its impact on the supply chain. The results indicate that five main barriers (unclear Industry 4.0 policy, higher risk investments, unsecured data sharing, lack of expertise, and lack of motivation) are considered barriers to adoption. Successful adoption of supply chain integration with the technology of Industry 4.0 can strengthen the manufacturing sector and competitiveness (Fernando et al., 2022). By leveraging the latest Industry 4.0 technologies, pharmaceutical companies can gain a real-time overview of their operations within their supply chain, enabling them to make data-driven decisions that improve performance, efficiency, resilience, and sustainability (Debnath et al., 2023). There is a growing need for companies and manufacturing systems to be flexible to adapt to rapid change and increasing uncertainty in society, markets, and supply chains. Several studies suggest that Industry 4.0 solutions support shorter innovation cycles, resource efficiency, faster decision-making, and higher flexibility in production (Höse et al., 2023). Sri Lankaś garment industry is trying to adopt Industry 4.0. Only a few developing countries have been able to take maximum advantage of the fourth industrial revolution. The study by Withanaarachchi and Silva (2023) aimed to identify the critical factors for the successful implementation of Industry 4.0. It was found that advances in digital technologies have a significant positive effect on financial investments and a negative effect

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

on organisational strategy and top management involvement in successfully implementing Industry 4.0 (Withanaarachchi & Silva, 2023). Another study aimed to examine the impact of knowledge-based technological pillars of Industry 4.0 to adopt the supply chain performance of Thai SMEs 4.0. The study identified four groups of Industry 4.0 technology pillars, specifically human support, automation, real-time, and security, which positively influence the performance of the supply chain (by increasing supply reliability, resource efficiency, reducing supply chain costs, and shortening lead times).

Another important finding is that supply chain performance positively influences the performance of an organisation in terms of profitability, Return on Investment (ROI), and sales growth (Sawangwong & Chaopaisarn, 2021). Nikolova (2023) performed an analysis of surveys in Bulgarian companies. Its results prove that, in the long run, the quantity and quality of human capital is the most decisive factor for the sustainable development of an organisation. More and more leaders and managers of companies are becoming aware of the need to invest in human capital and focus on creating value for their business by training their employees and building knowledge, skills, competencies, and motivational attitudes toward the changing work environment within Industry 4.0. There is a trend among businesses to apply continuously improving, technology-enabled processes (Nakandala et al., 2023). Despite the high investment costs of Industry 4.0, many developed countries and large enterprises are already using it (Dikhanbayeva et al., 2023).

3. Methodological Approach

3.1 Data

The methodology for the research is focused on the identification of specific companies operating in the Czech Republic, which are then subjected to a detailed analysis. For this purpose, publicly available information on the costs and depreciation of these companies will be used along with the collection of promotional materials, including brochures and documents from the official websites of each company. The collected information will then be studied in detail to identify and analyse the innovations and technological advances implemented by the selected companies. Data will be collected from the companies' annual reports for the years 2016–2022, which includes the period during which the companies published important information about their costs, investments, and earnings.

The data collected will be used as a basis for a detailed analysis of past investments and development of the selected companies. The analysis of the historical data on investments will be focused on assessing the company's past investments in technologies and innovations and the effect these investments had on the failure or success of corporate strategies. A total of five Czech companies will be selected (namely E-On, Robert Bosch, Madeta, Faurecia, and Mondi Bupak), which will be subjected to a detailed analysis in terms of their past investments and their impact on their position in the market and competitiveness. All the selected companies represent multinational companies operating in the South Bohemia region.

The data includes: Personnel Costs (PC): Total expenses incurred by the company for employee salaries, wages, and other compensation.

1. Number of Employees (E): The total number of employees within the company each year.
2. Fixed Asset Depreciation (D): The depreciation expense related to fixed assets as reported in the financial statements.
3. Net Income (NI): The total net income of the company after taxes and other deductions.
4. Total Revenues (TR): The total revenue generated by the company from its operations.

3.2 Methods

Data collected from the annual reports of the selected companies for the years 2016–2022 will be processed and subjected to analysis, entered into two tables, and then compared.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Table 1 will contain information about personnel costs of the selected companies in the years 2016–2022. This table will enable the comparison of the development of cost per employee in individual companies in the monitored period and identify their increase or decrease.

Table 2 will contain information on depreciation per crown of net income in the selected companies between 2016–2022. This table will be used to compare trends at the level of fixed asset depreciation and determine their development in the selected years.

In processing the data from the tables, it will be possible to follow the trends emerging during the monitored period, enabling a better understanding of the development of costs and depreciations of the selected companies and the possibility of identifying the relationship between these variables and other indicators of the financial health of the companies.

For the purposes of the research, special ratios will be created. The following formulas will be used for calculations:

$$K1 = \frac{Personnel\ cost}{Number\ of\ employees} \quad (1)$$

$$K2 = \frac{Fixed\ asset\ depreciation}{Net\ income} \quad (2)$$

$$K3 = \frac{Total\ revenues}{Number\ of\ employees} \quad (3)$$

$$K4 = \frac{Net\ income}{Number\ of\ employees} \quad (4)$$

Calculation of Pearson correlation is shown in the below equation 5.

$$r_{xy} = \frac{\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x}) * (y_i - \bar{y})}{S_x * S_y} \quad (5)$$

Where:

x_i and y_i	: are individual data points,
$\bar{x}$ and $\bar{y}$	: are the mean values of the datasets,
S_x and S_y	: are the standard deviations of the datasets.
n	: is the number of data points.

Next, a comparative analysis of case studies will be performed to compare the successful and unsuccessful implementation of Industry 4.0 technologies. The analysis focuses on identifying key differences between both cases regarding the implementation strategies, access to the technologies, and obstacles that have affected the result. The aim is to enable a deeper understanding of factors leading to success or failure in implementing modern technologies.

The analysis will be performed using a systematic approach, which includes the collection of relevant data, the structuring of information, and subsequent thorough evaluation aimed at the identification of key linkages and trends associated with a successful implementation of Industry 4.0 technologies. The calculated Pearson correlation coefficients will be interpreted to determine the strength and direction of the relationships between the variables. A positive correlation indicates that as one variable increases, the other also tends to increase. Conversely, a negative correlation suggests an inverse relationship. The strength of the correlation will be assessed based on the magnitude of the coefficient, with values closer to +1 or -1 indicating a stronger relationship. This study uses a statistical approach to analyse the relationship between important financial

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

variables such as personnel costs, net income, fixed asset depreciation, and sales in selected companies that follow Industry 4.0 standards. The analysis is based on data taken between 2016 and 2022 when Industry 4.0 technologies had an important effect on operational efficiency and cost structures in several industries.

4. Results and Discussion

4.1 Results: Presentation of selected companies

FRONIUS Česká republika s.r.o. – FRONIUS Česká republika s.r.o. is part of FRONIUS International GmbH, which specialises in welding technologies, battery charging, and renewable energy. Its products include welding equipment, solar inverters, and chargers for electric vehicles. The company is based in the Czech Republic and provides high-quality technical support and services for the industrial and energy sectors. The company focuses on innovation, quality, and sustainability of its products and services. The total sales for the last year (2022) amounted to CZK 2,110,382 thousand; income after tax was CZK 57,968 thousand. The company's taxable income was CZK 6,868 thousand.

Robert Bosch, spol. s. r. o. - Robert Bosch GmbH is an international company dealing with the manufacturing and distribution of technology solutions and services. The company specialises in automotive, industrial technology, consumer products, building technology, and technical systems. The total sales for the last year (2022) amounted to CZK 17,300,242 k; income after tax was CZK 307,334 k.

MADETA a. s. - Madeta a.s. is a Czech food company. It specialises in producing dairy products, such as cheese, processed cheese, butter, yogurt, and others. Madeta has a long history and is famous for its quality dairy products that are popular both in domestic markets and abroad. The total sales for the last year (2022) amounted to CZK 6,940,174 k; income after tax was CZK 212,952 k.

Faurecia Automotive Czech Republic s. r. o. - Faurecia Automotive Czech Republic s.r.o. is part of the international corporation Faurecia, which specialises in the manufacturing of automotive parts and components. The Czech branch of this company focuses on the development, production, and supply of automobile seats for the automotive industry. The total sales for the last year (2022), total sales amounted to CZK 17,899,054 k; income after tax was CZK 404,762 k.

Mondi Bupak s. r. o. - Mondi Bupak is in České Budějovice and currently employs about 220 people. It produces corrugated cardboard, which is then used for corrugated packaging solutions in an integrated production facility. It particularly focuses on the production of high-quality corrugated cardboard boxes used primarily in the main market segment of eCommerce. Its total sales for the last year (2022) amounted to CZK 2,038,898 k; income after tax was CZK 143,439 k.

Table 1 shows the development of personnel cost per employee in CZK thousands in the years 2016 - 2022 in five selected companies. FRONIUS Česká republika s.r.o., Robert Bosch, spol. s. r. o., MADETA a. s., Faurecia Automotive Czech Republic s. r. o., and Mondi Bupak s. r. o.

The values are interpreted as follows: First, From the FRONIUS Česká republika s.r.o. The cost per employee started at the level of CZK 441 thousand in 2016 and gradually reached CZK 665 thousand in 2022. There was a steady increase in costs with slight fluctuations until 2020. Then, the costs increased dramatically to CZK 623 thousand in 2020 and decreased to CZK 574 thousand in 2021. The year 2022 saw another significant growth to CZK 665 thousand. From the Robert Bosch, spol. s. r. o., the personnel costs per employee were significantly higher in the first year of the monitored period compared to the other companies, specifically, CZK 695 thousand. The costs grew gradually to CZK 981 thousand in 2022. A general trend with slight fluctuations can be seen; however, the year-on-year growth is not as pronounced as in other companies.

From the MADETA a. s. the costs per employee start at the level of CZK 380 thousand in 2016, gradually reaching CZK 593 thousand in 2022. The trend of increasing costs also shows slight fluctuations between individual years. Next in the Faurecia Automotive Czech Republic s. r. o. the cost per employee was at CZK

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

499 thousand in 2016 and rose to CZK 689 thousand in 2022. The company saw a relatively stable increase in costs, with minor fluctuations. From the Mondi Bupak s. r. o., the costs per employee were higher in the first year of the monitored period compared to MADETA and Faurecia, amounting to CZK 584 thousand, and gradually reached CZK 830 thousand in 2022. An increase with slight fluctuations can be seen, with a more pronounced increase in 2020, followed by a slight decrease and another growth in 2022.

Overall, it can be stated that the development of the cost per employee varied significantly in individual companies, with some companies experiencing stable growth with minor fluctuations. In contrast, others showed greater fluctuations, increases, and decreases in costs in specific years.

Table 1: Personnel cost per employee over the years in CZK thousands

Company	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
FRONIUS Česká republika s.r.o.	441	494	500	541	623	574	665
Robert Bosch, spol. s. r. o.	695	727	794	799	810	890	981
MADETA a. s.	380	429	467	507	518	544	593
Faurecia Automotive Czech Republic s. r. o.	499	537	562	594	576	585	689
Mondi Bupak s. r. o.	584	597	603	713	762	792	830

Source: Author

Table 2 shows the development of fixed asset depreciation per CZK of net income in the years 2016 – 2022 for the same selected companies. The values in the table represent the ratio of fixed asset depreciation to net income. The units are not specified.

At first, from the FRONIUS Česká republika s.r.o., the fixed asset depreciation relative to the net income of this company shows low values throughout the monitored period. In 2016, the value was only 0.2, increasing to 0.5 in 2022. Overall, it can be seen that a major part of the net income was allocated to costs other than the depreciation of fixed assets. From the Robert Bosch, spol. s. r. o., in n 2020, fixed asset depreciation showed a negative value of -9.5, which might result from an extraordinary activity or accounting adjustment. Fixed asset depreciation relative to net income fluctuated between 1.6 and 3.0.

Next, from the MADETA a.s., the ratio of fixed asset depreciation to net income ranged between 0.3 and 0.8 in the monitored period. In 2022, the value grew to 0.8, which might indicate a higher allocation of income to fixed asset depreciation. From the Faurecia Automotive Czech Republic s. r. o., the depreciation of fixed assets relative to net income in this company showed values between 0.3 and 1.2. The highest jump was recorded between 2016 and 2017 (from 1.2 to 0.3). From the Mondi Bupak s. r. o., this company showed a ratio of net income and fixed asset depreciation between 0.7 and 1.9 in the monitored period. In 2017, the highest value of 1.9 was recorded, which was then followed by a gradual decrease, reaching 0.7 in 2022.

Overall, it can be stated that the ratio of fixed asset depreciation and net income in each company shows specific fluctuation over the years. In some cases, major changes were recorded, which could be caused by various factors, such as accounting adjustments, changes in corporate strategies, or investment plans.

Table 2. Depreciation of fixed asset per CZK of net income in the monitored period

Company	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
FRONIUS Česká republika s.r.o.	0.2	0.3	0.2	0.1	0.4	0.2	0.5
Robert Bosch, spol. s. r. o.	2.8	1.6	2.3	1.6	-9.5	2.7	3.0
MADETA a. s.	0.3	0.4	0.7	0.6	0.4	0.7	0.8
Faurecia Automotive Czech Republic s. r. o.	1.2	0.3	0.6	0.3	0.5	0.5	0.3
Mondi Bupak s. r. o.	1.0	1.9	1.2	0.9	0.9	1.1	0.7

Source: Author

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Table 3 shows sales per employee in CZK thousands for the selected companies in the years 2016 – 2022. From the FRONIUS Česká republika s.r.o., in 2016, sales per employee amounted to CZK 3,576 thousand, gradually increasing and reaching CZK 4,221 thousand in 2022. A slight decrease to CZK 3,584 thousand was recorded in 2021, followed by significant growth in 2022. From the Robert Bosch, spol. s. r. o., the sales per employee amounted to CZK 6,112 thousand in 2016. This was followed by a gradual decrease to CZK 5,022 thousand in 2022. Within the monitored period, sales showed a gradual decrease with minor fluctuations. From the MADETA a.s., the sales per employee started at CZK 3,649 thousand in 2016. At the end of the monitored period, the value was CZK 5,389 thousand. The trend of sales per employee for this company showed stable growth with minor fluctuations.

Next from the Faurecia Automotive Czech Republic s. r. o., at the beginning of the monitored period, sales per employee were very high (CZK 30,110 thousand in 2016), increasing steadily and reaching CZK 54,078 in 2022. This indicator showed a consistent and pronounced trend, with an annual year-on-year increase. From the Mondi Bupak s. r. o., the sales per employee started at the level of CZK 4,373 thousand in 2016, gradually reaching CZK 8,784 thousand in 2022. The company also reported a continuous growth in sales, with a year-on-year increase.

Overall, it can be seen that the trend of sales per employee was different for each company. Some companies reported stable growth with minor fluctuations only, while others showed greater fluctuations and changes over the monitored years. Faurecia Automotive Czech Republic s. r. o. and Mondi Bupak s. r. o. showed a significant and continuous increase in sales per employee throughout the monitored period. In contrast, Robert Bosch, spol. s. r. o., showed a decreasing trend of sales per employee between 2016 and 2022.

Table 3. Company sales per employee in individual years in CZK thousands

Company	2016	2017	2018	2019	2020	2021	2022
FRONIUS Česká republika s.r.o.	3 576	3 744	3 513	3 957	3 680	3 584	4 221
Robert Bosch, spol. s. r. o.	6 112	5 515	5 736	5 620	4 763	4 925	5 022
MADETA a. s.	3 649	3 763	3 871	4 024	4 001	4 289	5 389
Faurecia Automotive Czech Republic s. r. o.	30 110	25 771	23 418	31 942	34 283	47 755	54 078
Mondi Bupak s. r. o.	4 373	4 904	4 984	5 011	5 968	6 655	8 784

Source: Author

Table 4 shows the net income generated by individual companies per employee in CZK thousand in 2016 – 2022.

From the FRONIUS Česká republika s.r.o., the net income per employee started at CZK 255 thousand in 2016. In 2022, it amounted to CZK 116 thousand. There were fluctuations between individual years. From the Robert Bosch, spol. s. r. o., in this company, net income per employee amounted to CZK 83 thousand in 2016, with a gradual increase to CZK 108 thousand in 2021, followed by a decline to CZK 89 thousand in 2022. The company showed a slight growth compared to the value in the first year of the monitored period.

Next from the MADETA a.s., in 2016, net income per employee amounted to CZK 241 thousand. In 2022, it declined to CZK 159 thousand, which means that the company reported an overall decline in net income per employee, with slight fluctuations over the years. From the Faurecia Automotive Czech Republic s. r. o., this company experienced considerable growth in net income per employee, starting from CZK 189 thousand in 2016 to CZK 1,223 thousand in 2022. The net income per employee in this company showed considerable and continuous growth throughout the monitored period. From the Mondi Bupak s. r. o., the net income per employee was CZK 198 thousand in 2016, reaching gradually CZK 610 thousand in 2022. The indicator shows stable and continuing growth throughout the whole monitored period.

Overall, it can be stated that individual companies show various trends in net income per employee, with some of them reporting stable growth while others experienced higher fluctuations and or a decrease. Faurecia Automotive Czech Republic s. r. o. and Mondi Bupak s. r. o. show considerable and stable growth in net income

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

per employee, while FRONIUS Česká republika s.r.o. and MADETA a. s. reported a decrease or a higher fluctuation over the years.

Table 4. Net income per employee in individual years in CZK thousand

Company	2016	2017	2018	2019	2020	2021	2022
FRONIUS Česká republika s.r.o.	255	149	177	325	121	209	116
Robert Bosch, spol. s. r. o.	83	133	107	169	-33	108	89
MADETA a. s.	241	198	114	151	222	179	159
Faurecia Automotive Czech Republic s. r. o.	189	761	448	1 234	737	756	1 223
Mondi Bupak s. r. o.	198	119	249	308	387	290	610

Source: Author

Figure 2 shows that in the FRONIUS Česká republika s.r.o, personnel cost per employee shows a relatively stable trend with slight fluctuations over the years. Between 2016 and 2022, there was a gradual increase in this indicator. In Robert Bosch, spol. s. r. o., the trend of personnel cost per employee experienced a gradual increase between 2016 and 2022. The indicator showed a year-on-year increase throughout the monitored period, with slight fluctuations. In the MADETA a.s., Personnel cost per employee grew gradually from 2016 to 2022, showing a relatively stable trend. In the Faurecia Automotive Czech Republic s. r. o., the company experienced a slight increase in personnel cost per employee in the monitored period, with certain fluctuations in individual years. In the Mondi Bupak s. r. o., the trend of personnel cost per employee shows a gradual increase between 2016 and 2022, with slight fluctuations in the monitored period.

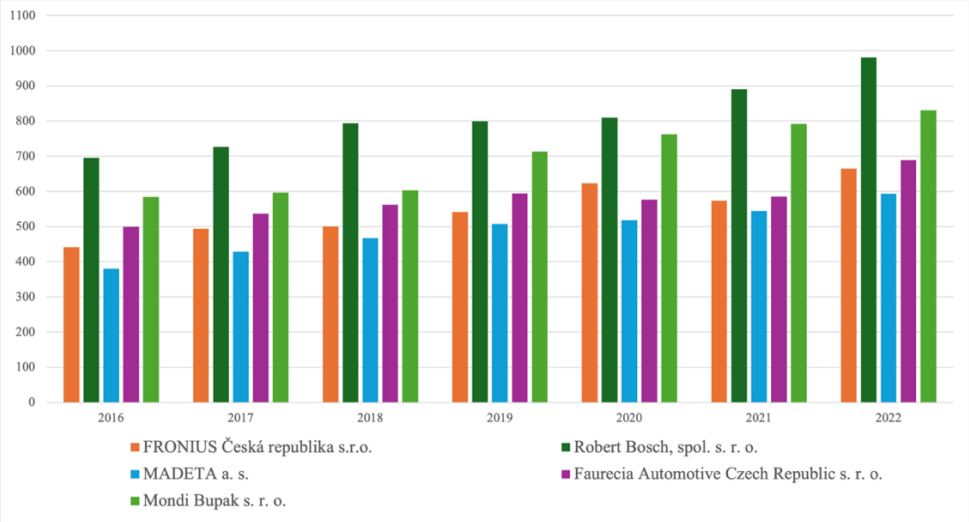


Figure 2. Personnel cost per employee in the monitored period in CZK thousand

Source: Author

Figure 3 shows a trend of personnel cost per employee in individual companies over the years. The trends might reflect changes in investment in human resources, wage growth, changes in the organisational structure, or other factors influencing employee-related costs. In the FRONIUS Česká republika s.r.o., the trend shows a slight increase and decrease in individual years, with the value ranging between 0.2 and 0.5. In Robert Bosch, spol. s. r. o., a significantly negative value was recorded in 2020, which may indicate an unusual situation or an exceptional year, as, in the following years, the value was positive again. In the MADETA a. s., the trend is relatively stable, with the values ranging from 0.3 to 0.8. In the Faurecia Automotive Czech Republic s. r. o., the value of fixed asset depreciation per CZK of net income remains relatively stable around the values of 0.3-0.6. The trend in Mondi Bupak s. r. o., ranges between 0.7 and 1.9, where in the last years of the monitored period, the value was stable, around 0.7. It also indicates different trends in the values of fixed asset depreciation

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

per CZK of income for individual companies. The data obtained might reflect variations in investment strategy, renewal of current assets, and asset management in individual companies within the monitored period.

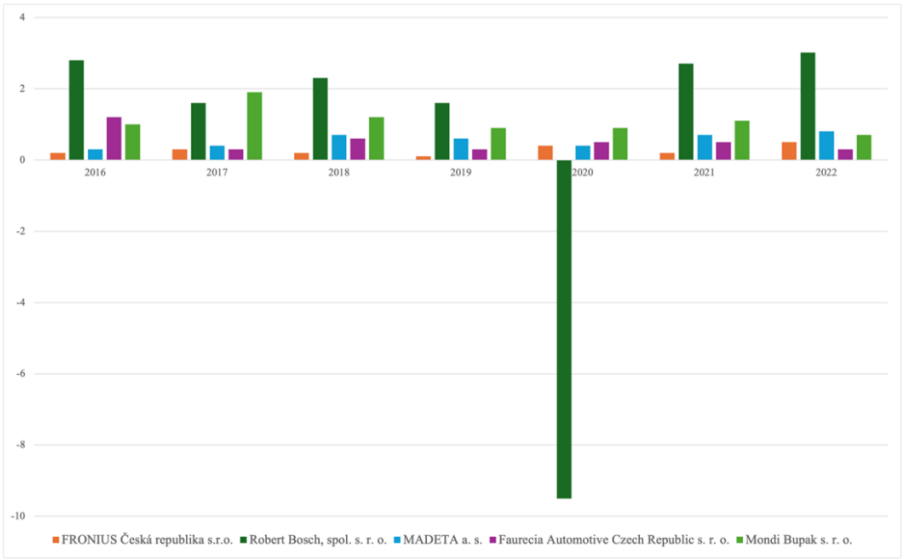


Figure 3. Trend of fixed asset depreciation relative to CZK of net income in CZK thousand

Source: Author

Figure 4 shows FRONIUS Česká republika s.r.o., the sales per employee show mild fluctuations within the monitored period, with a slightly upward trend between 2016 and 2022. In the Robert Bosch, spol. s. r. o., the trend of sales per employee showed a decrease between 2016 and 2022, with several fluctuations during this period. From the MADETA a.s., in this company, sales per employee show a gradual growth between 2016 and 2022, with minor fluctuations. The Faurecia Automotive Czech Republic s. r. o. reported a considerable increase in sales per employee in the years 2016 - 2022. The trend of Mondi Bupak s. r. o., in sales per employee shows a gradual increase in the monitored period, with several fluctuations recorded. It clearly shows different trends in sales per employee in individual companies. The differences might be due to different business growth strategies, changes in product portfolio, or changes in market conditions within the monitored period.

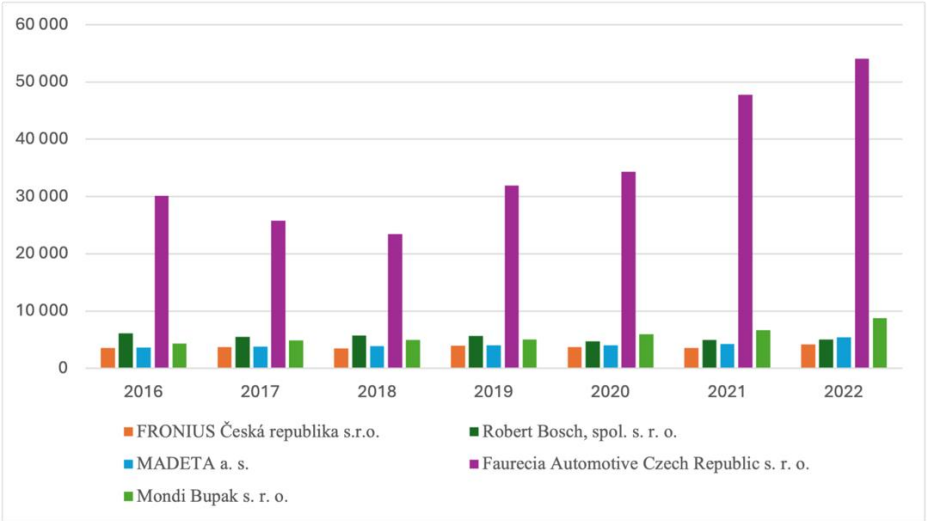


Figure 4. Sales per employee in individual years in CZK thousand

Source: Author

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Figure 5 shows that in FRONIUS Česká republika s.r.o., the trend of net income per employee is variable, with fluctuations recorded throughout the monitored period and a decrease in the years 2017 and 2021. In Robert Bosch, spol. S. r. o., the company reports a variable trend of net income per employee, with a decrease in 2017 and 2020 followed by an increase in 2021. From MADETA a.s., the trend shows a slight decrease in net income per employee between 2016 and 2022, with several fluctuations in some years. In Faurecia Automotive Czech Republic s. r. o., net income per employee showed significant growth between 2016 and 2022, with a large jump recorded in 2019. The trend of net income per employee in Mondi Bupak s. r. o., shows a slight increase with several fluctuations recorded throughout the period. It clearly shows diverse trends of net income per employee in individual companies. The differences may be due to various factors, such as changes in business, effective use of resources, or business growth strategies in the monitored period.

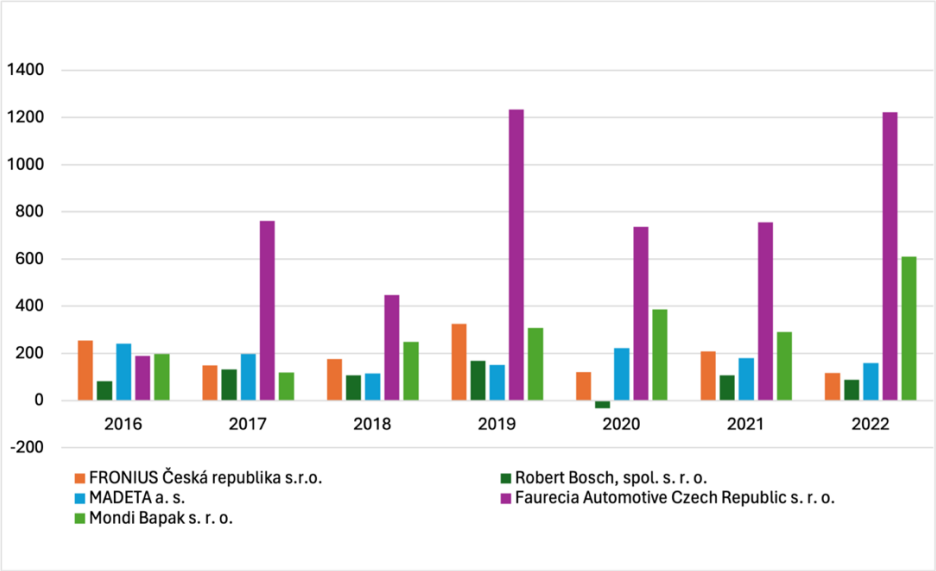


Figure 5. Net income per employee for individual years (in thousands CZK)

Source: Author

Pearson correlation between "Personnel cost per employee" and "Fixed asset depreciation to CZK of net income" for individual companies are as follows:

1. FRONIUS Česká republika s.r.o. : 0.699
2. Robert Bosch, spol. s. r. o. : 0.078
3. MADETA a. s. : 0.776
4. Faurecia Automotive Czech Republic s. r. o. : -0.654
5. Mondi Bupak s. r. o. : -0.620

The correlation coefficient value for the company FRONIUS Česká republika s.r.o. is 0.699, indicating a strong positive correlation between personnel cost per employee and fixed asset depreciation. This means that the relation between both variables is directly proportional; the value of depreciation of fixed assets grows with increasing personnel cost and vice versa. In the Robert Bosch, spol. s. r. o., the value of the correlation coefficient is 0.078, which indicates a very weak or no correlation between personnel cost per employee and fixed asset depreciation. There is no clear relationship between these two variables, implying that an increase or decrease in one variable does not necessarily influence the second variable.

The correlation value (0.776) of the company MADETA a. s. confirms a strong positive correlation between personnel cost per employee and fixed asset depreciation. This means that an increase in personnel cost causes

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

a decrease in fixed asset depreciation and vice versa. The correlation coefficient value (-0.654) of the company Faurecia Automotive Czech Republic s. r. o., indicates a strong negative correlation between personnel cost per employee and fixed asset depreciation. This negative relationship shows that an increase in personnel cost may lead to a decrease in fixed asset depreciation and vice versa. The value of the correlation coefficient in Mondi Bupak s. r. o (-0.620) again indicates a strong negative correlation between personnel cost per employee and fixed asset depreciation, which means that an increase in personnel cost may cause a decrease in fixed asset depreciation and vice versa. Overall, Figure 6 shows the values of the correlation coefficient and provides important information on the relationship between personnel cost per employee and fixed asset depreciation. Negative correlations for Faurecia Automotive and Mondi Bupak suggest an inverse relationship between these variables, while in the case of FRONIUS and MADETA, it is a directly proportionate relationship. For U Robert Bosch s. r. o., the correlation is weak or non-existent.

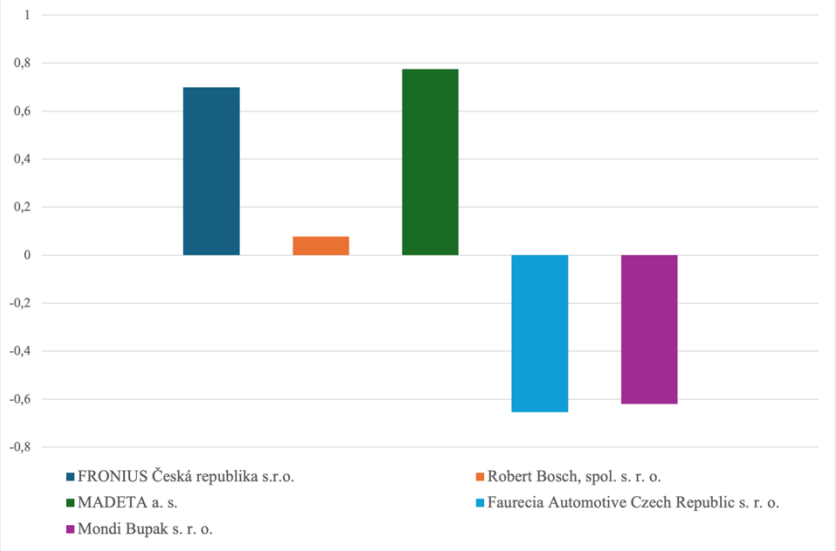


Figure 6. Values of correlation coefficients between personnel cost per employee and fixed asset depreciation per CZK of net income for individual companies.

Source: Author

4.2 Discussion of Results

RQ1: What is the correlation between the development of personnel costs per employee and net income per employee of the selected companies in the years 2016 – 2022?

The results of the analysis show variability in the relationship between the development of personnel cost per employee and net income per employee for individual companies under analysis in the period of 2016 – 2022. For some companies, such as FRONIUS Česká republika s.r.o. and MADETA a.s., a strong positive correlation between the development of personnel cost and fixed asset depreciation per CZK of income was identified, which indicates that an increase in personnel cost might be correlated with higher depreciation of fixed assets, hereby influencing net income per employee.

In contrast, companies such as Robert Bosch, Faurecia Automotive Czech Republic s.r.o. and Mondi Bupak s.r.o. show a weaker or even negative correlation. In the case of Robert Bosch, there is no clear indication of a relationship between the development of personnel cost and depreciation of fixed assets per CZK of income, while the negative correlation in the case of Faurecia Automotive Czech Republic s.r.o. and Mondi Bupak s.r.o. indicates that an increase in personnel cost can be related to a decrease in fixed asset depreciation, which may have a negative impact on net income per employee.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Such variability suggests the existence of various dynamics and factors influencing the relationship between cost per employee and income in individual companies. Moreover, it also confirms that an increase in cost per employee does not necessarily generate a higher income due to the influence of specific factors and strategies employed by the companies over time.

The results suggest that the relationship between the trend of personnel cost and fixed asset depreciation per CZK of net income differs in individual companies. For some companies, a strong and positive correlation was confirmed (FRONIUS, MADETA), while in other companies, it is weaker or even negative (Faurecia Automotive, Mondi Bupak). For Robert Bosch, the relationship between these two variables could not be clearly defined. The research results are in line with several studies mentioned by Jaafar et al. (2018) and Clemons et al. (2017).

Jaafar et al. (2018) point out that factors such as indebtedness and profitability might play an important role when analysing the relationship between personnel cost per employee and net income per employee, as well as in the case of examining the relationship between the impact of fixed asset depreciation on net income. The author's research findings support this concept, as there is variability in the relationship between the trend of personnel cost and net income per employee in individual companies.

Clemons et al. (2017) point to the usefulness of analysing the allocation of labour and cost while considering the development of personnel cost per employee and total sales per employee. The author's findings support this statement, as they suggest the existence of variability in the relationship between cost per employee and net income in individual companies, which may be due to various factors, including the allocation of funds and costs.

RQ2: What is the correlation between the depreciation of fixed assets per crown of net income and the development of sales-per-employees in the selected companies in the years 2016 – 2022?

To assess the effect of fixed asset depreciation on net income in comparison with the trend of sales per employee, it is necessary to compare the trend of fixed asset depreciation with the trend of sales per employee. Fixed asset depreciation in the FRONIUS Česká republika s.r.o., shows a relatively low trend, with the values ranging from 0.1 to 0.5. Sales per employee grew gradually from 3,576 in 2016 to 4,221 in 2022. Based on these findings, it is not possible to determine the direct relationship between fixed asset depreciation and the trend of sales per employee.

In 2020, the company Robert Bosch, spol. s. r. o., experienced a considerable decrease in fixed asset depreciation per CZK of net income (-9.5), followed by growth in the next years. Sales per employee decreased from 6,112 in 2016 to 5,022 in 2022. A certain relationship can be seen between a significant decrease in sales per employee and a subsequent decrease in fixed asset depreciation; however, a direct correlation cannot be determined. In the company MADETA a.s., the values of fixed asset depreciation fluctuated between 0.3 and 0.8. Sales per employee grew from 3,649 in 2016 to 5,389 in 2022. No clear relationship between the trend of fixed asset depreciation and sales per employee can be identified.

Fixed asset depreciation of the company Faurecia Automotive Czech Republic s. r. o. showed a relatively stable trend, with values ranging from 0.3 and 1.2. Sales per employee grew from 30,110 in 2016 to 54,078 in 2022. There is no clear direct relationship between the trend of fixed asset depreciation and sales per employee.

In the Mondi Bupak s. r. o., the trend of fixed asset depreciation fluctuated between 0.7 and 1.9. Sales per employee increased from 4,373 in 2016 to 8,784 in 2022. As in other companies, it is not possible to determine the relationship between the trend of fixed asset depreciation and sales per employee. Overall, it can be seen that for most companies, the relationship between the trend of fixed asset depreciation and total sales per employee cannot be determined. Both metrics seem to have developed independently in the monitored period, with no consistent pattern or relationship between these two factors. Jaafar et al. (2018) confirm that the financial stability and performance of the company can positively affect the development of sales per employee and fixed

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

asset depreciation. Especially in the context of the effect of depreciation on net income, it is necessary to consider the interaction of these factors with other indicators of a company's financial health.

5. Conclusions

The paper's objective was to analyse the major factors affecting corporate decision-making on investing in the technologies of Industry 4.0 and identify the key barriers that hinder companies from entering this era. The objective of the paper was achieved. However, there are certain limitations and a need for further research. The paper provides valuable information and outlines the relationship between the observed variables. Nevertheless, due to the diversity of the results, further research and in-depth analysis are needed to understand the relationship between these factors better. Therefore, it is necessary to consider other aspects when interpreting and applying the findings in practice.

In the context of examining the correlation between the trend of personnel cost per employee and net income for the selected companies in the period of 2016-2022, different levels of correlation were found. For some companies (e.g., FRONIUS and MADETA), a stronger and positive correlation was identified between the development of these variables, while in other companies (Faurecia Automotive and Mondi Bupak), a weaker or even negative correlation was determined. In the case of Robert Bosch, the relationship between personnel cost and net income could not be clearly defined.

As regards the effect of fixed asset depreciation per CZK of net income in comparison with the trend of sales per employee, no clear relationship was confirmed for most of the companies under study. The relationship between the development of these factors seems to be inconsistent, with no single pattern. The impact of factors such as financial stability and performance of the company might be important when examining these relationships and their effect on the company's financial health.

Overall, it can be stated that the relationship between the development of personnel cost per employee and fixed asset depreciation represents a comprehensive financial indicator and can be influenced by various factors important for the company's overall performance.

Let's look into some of the benefits of this research. First, the comprehensive analysis of the relationship between personnel cost, fixed asset depreciation, and key financial indicators, such as net income and sales per employee for selected companies in the monitored period. Statistical tools and correlation analysis were used to identify differences in interaction between the observed variables for individual companies. The information and findings from the research can provide a context for managerial decision-making and strategic planning in finance and human resources.

Now, we have to look into the drawbacks of this research. First, the lack of detailed information on the data collection method and the limited period (2016-2022) can limit the scope of the analysis and generalisations of conclusions made. Secondly, the limitation of the research only to companies operating in the South Bohemia region can distort the results obtained since economic and industrial conditions, regulations, and market behaviour can differ in different regions or countries. Given the diversity of the results, further research and in-depth analysis are needed to understand the relationship between the observed factors better. Overall, the paper provides valuable information and outlines the relationship between the observed variables. However, due to the limitations identified and the need for further research in this field, other aspects shall be considered when interpreting and applying the findings in practice.

References

Alper, A., Alper, F., & Ozayturk, G. (2023). *Dynamics of Technological Unemployment, Leadership, and Entrepreneurship during the Industry 4.0 Revolution* (pp. 21–46). https://doi.org/10.1201/9781003314615-2

Bičo Ćar, M., Stupar, S., Šestić, M., & Karabegović, I. (2023). Assessment of the Readiness of Companies for the Application of Industry 4.0 with the Help of an Expert System. In I. Karabegovic, A. Kovačević, & S. Mandzuka (Eds.), *New Technologies, Development and Application VI* (pp. 556–568). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-34721-4_60

Bueno, A., Goyannes Gusmão Caiado, R., Guedes de Oliveira, T. L., Scavarda, L. F., Filho, M. G., & Tortorella, G. L. (2023). Lean 4.0 implementation framework: Proposition using a multi-method research approach. *International Journal of Production Economics*, *264*, 108988. https://doi.org/10.1016/j.ijpe.2023.108988

Butollo, F., Flemming, J., Gerber, C., Krzywdzinski, M., Wandjo, D., Delicat, N., & Herzog, L. (2023). COVID-19 as a Jump Start for Industry 4.0? Motivations and Core Areas of Pandemic-Related Investments in Digital Technologies at German Firms. *Sci*, *5*(3), Article 3. https://doi.org/10.3390/sci5030028

Cardoso, M., Enrique, A., Pinto Ferreira, L., & Peláez-Lourido, G. (2023). *Artificial Intelligence and I4.0 in Manufacturing: The Role of Sustainability* (pp. 582–589). https://doi.org/10.1007/978-3-031-38165-2_68

Chakraborty, T., Awan, T. M., Natarajan, A., & Kamran, M. (Eds.). (2023). *Agile Leadership for Industry 4.0: An Indispensable Approach for the Digital Era*. Apple Academic Press. https://doi.org/10.1201/9781003314615

Cirillo, V., Fanti, L., Mina, A., & Ricci, A. (2022). The Adoption of Digital Technologies: Investment, Skills, Work Organisation. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4181459

Clemons, E., Dewan, R., Kauffman, R., & Weber, T. (2017). *Introduction to Strategy, Information, Technology, Economics, and Society (SITES) Minitrack. 2016.* https://doi.org/10.24251/HICSS.2017.669

Cornejo-Velazquez, E., & Clavel-Maqueda, M. (2023). *Advances and Challenges to Adoption of Industry 4.0 in the Manufacturing Sector: Case of Mexico* (pp. 11–44). https://doi.org/10.4018/978-1-6684-9267-3.ch002

Da Roit, B., & Iannuzzi, F. E. (2022). One of many roads to industry 4.0? Technology, policy, organisational adaptation and worker experience in 'Third Italy' SMEs. *New Technology, Work and Employment*, *38*. https://doi.org/10.1111/ntwe.12241

Debnath, B., Shakur, M., Bari, A. B. M. M., Saha, J., Porna, W., Mishu, M., Islam, A., & Rahman, M. (2023). Assessing the critical success factors for implementing industry 4.0 in the pharmaceutical industry: Implications for supply chain sustainability in emerging economies. *PloS One*, *18*, e0287149. https://doi.org/10.1371/journal.pone.0287149

Dikhanbayeva, D., Aitzhanova, M., Lukhmanov, Y., Turkyilmaz, A., Shehab, E., & El-Thalji, I. (2023). Industry 4.0 Readiness Assessment of Enterprises in Kazakhstan. In E. Alfnes, A. Romsdal, J. O. Strandhagen, G. von Cieminski, & D. Romero (Eds.), *Advances in Production Management Systems. Production Management Systems for Responsible Manufacturing, Service, and Logistics Futures* (pp. 297–310). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-43662-8_22

Durana, P., Kral, P., Stehel, V., Lazaroiu, G., & Sroka, W. (2019). Quality Culture of Manufacturing Enterprises: A Possible Way to Adaptation to Industry 4.0. *Social Sciences*, *8*(4), Article 4. https://doi.org/10.3390/socsci8040124

Dvořáková, L., Horák, J., Caha, Z., Machová, V., Hašková, S., Rowland, Z., & Krulický, T. (2021). Adaptation of small and medium-sized enterprises in the service sector to the conditions of Industry 4.0 and Society 4.0: Evidence from the Czech Republic. *Economic Annals-XXI*, *191*, 67–87. https://doi.org/10.21003/ea.V191-06

Fasuludeen Kunju, F. khan, Naveed, N., Anwar, M. N., & Ul Haq, M. I. (2021). Production and maintenance in industries: Impact of industry 4.0. *Industrial Robot: The International Journal of Robotics Research and Application*, *49*(3), 461–475. https://doi.org/10.1108/IR-09-2021-0211

Fatima, A., & Ali, S. (2023, September 22). *On Economic Impact of Industry 4.0: Time-Driven Activity-Based Costing System*. https://doi.org/10.4271/2023-01-5065

Fernando, Y., Sari, I., Gui, A., Ikhsan, R., Mergeresa, F., & Ganesan, Y. (2022). A mixed-method study on the barriers of industry 4.0 adoption in the Indonesian SMEs manufacturing supply chains Indonesian SMEs manufacturing supply chains. *Journal of Science and Technology Policy Management*, *14*. https://doi.org/10.1108/JSTPM-10-2021-0155

Ferreira, J. J., Lopes, J., Gomes, S., & Rammal, H. (2023). Industry 4.0 implementation: Environmental and social sustainability in manufacturing multinational enterprises. *Journal of Cleaner Production*, 404. https://doi.org/10.1016/j.jclepro.2023.136841

Höse, K., Amaral, A., Götze, U., & Peças, P. (2023). Manufacturing Flexibility through Industry 4.0 Technological Concepts—Impact and Assessment. *Global Journal of Flexible Systems Management*, 24. https://doi.org/10.1007/s40171-023-00339-y

Jaafar, M., Muhamat, A. A., Alwi, S., & Abdul Karim, N. (2018). Determinants of Financial Distress among the Companies Practise Note 17 Listed in Bursa Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 8. https://doi.org/10.6007/IJARBSS/v8-i11/4956

Jarašūnienė, A., Čižiūnienė, K., & Čereška, A. (2023). Research on Impact of IoT on Warehouse Management. *Sensors*, *23*(4), Article 4. https://doi.org/10.3390/s23042213

Joppen, R., Kühn, A., Förster, M., & Dumitrescu, R. (2023). Evaluation of Industry 4.0 Applications in Production. *Journal of the Knowledge Economy*, *14*(3), 2479–2514. https://doi.org/10.1007/s13132-022-00959-2

Khlil, A., Shi, Z., Umar, A., & Ma, B. (2023). A New Industry 4.0 Approach for Development of Manufacturing Firms Based on DFSS. *Processes*, *11*(7), Article 7. https://doi.org/10.3390/pr11072176

Maganga, D., & Taifa, I. (2022). Quality 4.0 transition framework for Tanzanian manufacturing industries. *The TQM Journal*, *35*. https://doi.org/10.1108/TQM-01-2022-0036

Nakandala, D., Yang, R. (Chunhui), Lau, H., & Weerabahu, S. (2023). Industry 4.0 technology capabilities, resilience and incremental innovation in Australian manufacturing firms: A serial mediation model. *Supply Chain Management: An International Journal*, *28*. https://doi.org/10.1108/SCM-08-2022-0325

Nikolova, N. I. (2023). Human Capital in The Changing Work Environment of Industry 4.0. *Environment. Technologies. Resources. Proceedings of the International Scientific and Practical Conference*, *3*, 187–193. https://doi.org/10.17770/etr2023vol3.7177

Nirmal, D. D., & Reddy, K. N. (2024). Industry 4.0 Technologies: Opportunities in the Sustainable Supply Chain Management. In K. E. K. Vimal, S. Rajak, V. Kumar, R. S. Mor, & A. Assayed (Eds.), *Industry 4.0 Technologies: Sustainable Manufacturing Supply Chains: Volume 1—Theory, Challenges, and Opportunity* (pp. 125–136). Springer Nature. https://doi.org/10.1007/978-981-99-4819-2_9

Ocakci, E., Draghici, A., & Niemann, J. (2023). *Resources Collaboration and Optimisation in Industry 4.0 Environments* (pp. 483–494). https://doi.org/10.1007/978-3-031-15602-1_35

Oláh, J., Novotná, A., Sarıhasan, İ., Erdei, E., & Popp, J. (2022). Examination of The Relationship Between Sustainable Industry 4.0 and Business Performance. *Journal of Competitiveness*, *14*, 25–43. https://doi.org/10.7441/joc.2022.04.02

Oláh, J., Hidayat, Y. A., Gavurova, B., Khan, M. A., & Popp, J. (2021). Trust levels within categories of information and communication technology companies. *Plos one*, *16*(6), e0252773. https://doi.org/10.1371/journal.pone.0252773

Papouskova, K., Telecký, M., & Čejka, J. (2020). Process Efficiency Analysis of Selected Automotive Companies in Europe. *Communications - Scientific Letters of the University of Zilina*, *22*, 20–27. https://doi.org/10.26552/com.C.2020.4.20-27

Rawat, P., Kaushik, Y., & Purohit, J. K. (2023). Barriers to industry 4.0 implementation in Indian SMEs. *AIP Conference Proceedings*, *2782*(1), 020144. https://doi.org/10.1063/5.0154347

Saihi, A., Awad, M., & Ben-Daya, M. (2021). Quality 4.0: Leveraging Industry 4.0 technologies to improve quality management practices – a systematic review. *International Journal of Quality & Reliability Management*, *ahead-of-print*. https://doi.org/10.1108/IJQRM-09-2021-0305

Sawangwong, A., & Chaopaisarn, P. (2021). The impact of applying knowledge in the technological pillars of Industry 4.0 on supply chain performance. *Kybernetes*, *ahead-of-print*. https://doi.org/10.1108/K-07-2021-0555

Shen, C.-Y., Huang, Y.-F., Weng, M.-W., Lai, I.-S., & Huang, H.-F. (2023). The Role of Industry 4.0 and Circular Economy for Sustainable Operations: The Case of Bike Industry. *Applied Sciences*, *13*(10), Article 10. https://doi.org/10.3390/app13105986

Silva, F. T. da, Baierle, I. C., Correa, R. G. de F., Sellitto, M. A., Peres, F. A. P., & Kipper, L. M. (2023). Open Innovation in Agribusiness: Barriers and Challenges in the Transition to Agriculture 4.0. *Sustainability*, *15*(11), Article 11. https://doi.org/10.3390/su15118562

Simionescu, M., Szeles, M. R., Gavurova, B., & Mentel, U. (2021). The impact of quality of governance, renewable energy and foreign direct investment on sustainable development in cee countries. *Frontiers in Environmental Science*, *9*, 765927. https://doi.org/10.3389/fenvs.2021.765927

Simionescu, M., Strielkowski, W., & Gavurova, B. (2022). Could quality of governance influence pollution? Evidence from the revised Environmental Kuznets Curve in Central and Eastern European countries. *Energy Reports*, *8*, 809-819. https://doi.org/10.1016/j.egyr.2021.12.031

Singh, A., Kumar, V., Verma, P., & Kandasamy, J. (2023). Identification and severity assessment of challenges in the adoption of industry 4.0 in Indian construction industry. *Asia Pacific Management Review*, *28*(3), 299–315. https://doi.org/10.1016/j.apmrv.2022.10.007

Skare, M., Gavurova, B., & Rigelsky, M. (2023). Innovation activity and the outcomes of B2C, B2B, and B2G E-Commerce in EU countries. *Journal of Business Research*, *163*, 113874. https://doi.org/10.1016/j.jbusres.2023.113874

Skare, M., Gavurova, B., & Tkacova, A. (2024a). Analytical framework for industry-oriented leading cyclical indicators: Empirical investigation of EU economic cycles. *Acta Oeconomica*, *74*(2), 145-167. https://doi.org/10.1556/032.2024.00007

Skare, M., Gavurova, B., & Rigelsky, M. (2024b). Quantification of the impact of innovations in industry and infrastructure for sustainable circular economy production and consumption. *Journal of Innovation & Knowledge*, *9*(1), 100456. https://doi.org/10.1016/j.jik.2023.100456

Škare, M., Gavurova, B., & Porada-Rochon, M. (2024c). Digitalisation and carbon footprint: Building a path to a sustainable economic growth. *Technological Forecasting and Social Change*, 199, 123045. https://doi.org/10.1016/j.techfore.2023.123045

Skare, M., Gavurova, B., & Burić, S. B. (2024d). Artificial Intelligence and Wealth Inequality: A Comprehensive Empirical Exploration of Socioeconomic Implications. *Technology in Society*, 102719. https://doi.org/10.1016/j.techsoc.2024.102719

Tostes, A. D., & Azevedo, A. (2024). A Value-Oriented Framework for Return Evaluation of Industry 4.0 Projects. In F. J. G. Silva, A. B. Pereira, & R. D. S. G. Campilho (Eds.), *Flexible Automation and Intelligent Manufacturing: Establishing Bridges for More Sustainable Manufacturing Systems* (pp. 871–878). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-38241-3_95

Trianni, A., Bennett, N., Cantley-Smith, R., Cheng, C.-T., Dunstall, S., Hasan, A. S. M. M., Katic, M., Leak, J., Lindsay, D., Pears, A., Wheatland, F. T., White, S., & Zeichner, F. (2024). Industry 4.0 for Energy Productivity: Insights and Future Perspective for Australia. In F. J. G. Silva, L. P. Ferreira, J. C. Sá, M. T. Pereira, & C. M. A. Pinto (Eds.), *Flexible Automation and Intelligent Manufacturing: Establishing Bridges for More Sustainable Manufacturing Systems* (pp. 547–554). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-38165-2_64

Withanaarachchi, A., & Silva, A. M. (2023). *Critical Success Factors Affecting the Successful Implementation of Industry 4.0 in The Sri Lankan Apparel Manufacturing Industry*, 1–8. https://doi.org/10.1109/SCSE59836.2023.10214987

Ye, F., Ouyang, Y., & Li, Y. (2023a). Digital investment and environmental performance: The mediating roles of production efficiency and green innovation. *International Journal of Production Economics*, *259*, 108822. https://doi.org/10.1016/j.ijpe.2023.108822

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request

Author Contributions: All authors contributed equally. All authors have read and agreed to the published version of the manuscript.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/x5537493962

Ondřej PECLINOVSKÝ is a researcher at the Department of School of Expertness and Valuation at the Institute of Technology and Business in České Budějovice, Czech Republic, Okružní 517/10, 37001 České Budějovice. Peclinovský's research interests are focused on macroeconomics and international economics, where he explores the broader economic factors that impact national and global economies. His role involves contributing to the academic understanding and analysis of economic trends and policies on both a national and international scale.
ORCID ID: https://orcid.org/0009-0009-2812-966X

Robin KUNJU MOL RAJ is a Research Assistant at the Institute of Technology and Business in České Budějovice, located at Okružní 517/10, 37001 České Budějovice, Czech Republic. His research interests are diverse, encompassing microeconomics, statistics, macroeconomics, and econometrics, as well as advanced computational methods like machine learning and neural networks. His work involves applying both traditional economic theories and modern data-driven techniques to analyse and interpret economic phenomena. This interdisciplinary approach allows him to contribute to the evolving fields of economics and artificial intelligence.
ORCID ID: https://orcid.org/0009-0000-3492-4074

Harinaraynan Kayathingal is a Research Assistant at the Faculty of Economics Group, Institute of Technology and Business in České Budějovice, Czech Republic. He has a strong focus on macroeconomics and financial studies, exploring the dynamics of economic systems and financial markets. With a master's degree in computer applications, Harinarayanan is also deeply interested in neural networks and machine learning, applying these advanced techniques to his research in macroeconomics. His interdisciplinary approach combines economics and technology, enabling him to provide innovative insights into economic trends and financial stability through computational methods.
ORCID ID: https://orcid.org/0009-0004-4389-1138

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

Publisher
http://jssidoi.org/esc/home

EVALUATION OF FINANCIAL PERFORMANCE OF ENGINEERING COMPANIES IN CZECH REPUBLIC AND CENTRAL EUROPE

Josef Bureš [1], Nikola Sobotková [2], Vojtěch Bartoš [3]

[1,2,3] Brno University of Technology, Faculty of Business and Management, Department of Finances, Kolejní 2906/4, 61200 Brno, Czech Republic

E-mails: [1]Josef.Bures1@vutbr.cz; [2]Nikola.Sobotkova@vutbr.cz; [2]bartos@vut.cz

Received 11 July 2024; accepted 9 November 2024; published 30 December 2024

Abstract. This article aims to analyse the development of the financial performance of engineering companies and evaluate the situation of the last decade in the Czech Republic and the neighbouring countries. The analysis of the development of the financial performance of engineering companies in the Czech Republic is carried out over the last 10 years and compared through the Winsorized mean with the situation in engineering in the neighbouring countries. The article is based on data collected in secondary research and relevant articles. The results of the selected financial indicators suggest that the engineering sector in the Czech Republic shows the best values only in terms of the indebtedness indicator. Other indicators show a more favourable position of engineering enterprises in Austria and Germany, demonstrating a higher degree of automation and innovation. Within the V4 countries, Hungary is the leading country according to the results of individual indicators. However, all the selected countries show problems in terms of the Liabilities Turnover Ratio, which is followed by an issue with low values in the profitability indicator. From the cited sources, previous articles, and the analysis carried out, engineering companies in the Czech Republic show average results in the selected financial indicators in the monitored period. In terms of financial performance, the engineering sector in Austria and Germany is in the leading position among the selected countries. The engineering sector in the Czech Republic should focus on increasing profitability, which would be facilitated by increasing technological progress and innovation.

Keywords: financial performance; engineering; Visegrad group; the EU; industry 4.0

Reference to this paper should be made as follows: Bureš, J., Sobotková, N., Bartoš, V. 2024. Evaluation of the financial performance of engineering companies in the Czech Republic and Central Europe. *Entrepreneurship and Sustainability Issues*, 12(2), 262-274. http://doi.org/10.9770/p3627979668

JEL Classifications: M21, G32

1. Introduction

The economy is divided into three sectors: primary (agriculture, etc.), secondary (industry, construction, etc.) and tertiary (services). Industry, therefore, falls within the secondary sector of the economy in the Czech Republic and is further divided into mining and manufacturing. Engineering is classified as manufacturing. Engineering itself can be divided into many sub-industries, therefore it can be considered the most complicated industry, but at the same time, it is the most important industry for the Czech economy in terms of industry, as the largest pillars of Czech industry can be considered to be the engineering, construction or food industries (Svatoš, 2009). We are in the Fourth Industrial Revolution (4IR), a trend towards automation and data exchange in manufacturing technologies and processes. Studies have shown that the Fourth Industrial Revolution technologies can improve productivity growth and safety measures (Aigbavboa et al., 2023). In recent years,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

research topics related to the fourth industrial revolution, also known as Industry 4.0, have gradually been accepted and promoted by governments and organisations worldwide (Liao et al., 2017).

We need to prepare engineering students for a future marked by volatility, uncertainty, complexity, and ambiguity ("VUCA"). Talent and skills gaps are expected to widen across all industries in the coming years (Buehler et al., 2022). Schäfer (2018) argues that the EU can create a dynamic and open environment for the fourth industrial revolution and new technologies. The engineering industry is one of the primary drivers of economic growth in every country, especially in Central Europe, where such industries as automotive, machinery, and high-tech manufacturing dominate the economic landscape. The country possesses a long tradition in engineering, which is quite similar to most of its neighbouring countries, and this sector has been playing a crucial role in the regional economy's stability and growth. Engineering is responsible for the profound transformation of human relations in the twenty-first century's first decade, altering education paradigms and business (Brito et al., 2013).

Industrial engineering strategies positively affect the overall performance of the entire business (Rajnoha et al., 2018). Nowadays, there is a lot of automation in the engineering industry. People are facing significant changes due to automation in manufacturing technologies (Skare et al. 2023; Kuzmenko et al. 2023). Current digitisation in our daily lives helps us to improve their quality. The engineering industry also undergoes enhanced digitisation (Pruskova, 2019).

The role of financial managers in engineering companies will be to uphold the good financial results shown in the past (Gavurova et al. 2022; Lukáč et al., 2022). While engineering managers recognise the significance of costing, they often overlook the actual compilation and monitoring process (Mehmood et al., 2023). They rely on software-generated costing values and may not fully understand the calculation process. The values obtained are corrected based on empirical experience and anticipated needs. This procedure can lead to errors such as assigning unrelated costs, selecting an incorrect cost allocation base, and using the same calculation procedures for all performances (Hudáková Stašová, 2023). Managerial decision-making is one of the most important factors influencing a company's competitiveness. Financial and economic analysis is an essential component of financial management in business entities (Stefko et al., 2019).

In the Czech Republic, Pilsen is the leading business centre of the West Bohemia region. Many larger and medium-sized engineering companies are in the Pilsen region (Váně et al., 2021). General engineering in Pilsen is the economy's main driver when considering the Pilsen agglomeration (Krajicek et al., 2019). In the Czech Republic, the emergence of traditional manufacturing centres was strongly linked to access to natural resources such as coal, water sources, and ore mines. Many businesses located their operations in the neighbourhoods of major Czech cities such as Ostrava and Brno, among others, and this coincidental location triggered a dynamic process of cumulative causation. The initial localised advantages shifted to physical and natural advantages, resulting in a pervasive industrialisation process (Arias-Gomez & Antošová, 2023).

The improvement of industrial engineering performance is currently a major concern. Companies can make such improvements in various ways (Spalek, 2013). Therefore, this article deals with the analysis of the development of the financial performance of engineering companies.

2. Literature Review

Financial performance in an engineering company would be deemed an understatement for understanding the sustainability, potential growth, and overall economic influence of engineering companies. In regions like the Czech Republic and Central Europe, where the engineering sector plays a vital role in the economy, assessing financial health by strong metrics is mandated (Gavurova et al., 2017). One of these metrics is the debt-to-asset ratio, which gives an understanding of the extent to which companies rely on debt to finance their assets. This paper reviews the literature available for assessing financial performance in engineering firms, which indicates the wide use of the debt-to-asset ratio as the primary analytical tool.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

Measuring and evaluating an enterprise's financial performance is one of the most important indicators of its overall market success (Malichová & Ďurišová, 2015) and The evaluation of a company's performance is an essential component of every company's management, as it allows for the determination of the impact of business management decisions on performance results, as well as the direction of the results and the decisions that must be made to improve them. Achieving exceptional financial performance is a top priority for every management team because it is critical in establishing a strong firm structure and facilitating growth (Skare et al. 2024; Baby et al., 2024). Radonic et al. (2021) help business experts identify, manage, and analyse intellectual capital and its impact on business results. Efficient technology can improve productivity and align economic and social development strategies (Tkacova & Gavurova, 2023; Muthuraman, 2020). Many researchers conducted studies to analyse the financial performance of companies (Ali et al., 2008; Jin & Xu, 2020; Lehenchuk et al., 2023). In this literature review, we discuss the method used by different researchers to analyse the financial performance of companies.

To analyse the financial performance of Healthcare companies, Tengilimoğlu et al. (2023) collected financial data from publicly traded healthcare companies and used ratio analysis to calculate three liquidity, leverage, and profitability ratios for use as financial performance indicators, then performed the Wilcoxon signed-rank test for evaluation. Simionescu (2016) conducted a study to evaluate the financial performance of 293 companies in London by using various statistical methods. The study employed regression and cluster analyses to test the influence of financial ratios—specifically book-to-market, cash-to-assets, cash flow, and leverage—on the respective financial performance of 293 companies domiciled in London during 2014. Lam et al. (2021) introduce the MDCM model, the entropy-fuzzy VIKOR model, to evaluate and compare the financial performance of construction companies. Tehrani et al. (2012) developed a model to analyse corporate performance using Data Envelopment Analysis (DEA) and tested it on a group of companies. By using financial ratios as input and output indices in the DEA model, the resulting model can evaluate the financial performance of companies. Tsolas (2020) research uses the RAM (Range Adjusted Measure)-Tobit model to assess the performance of a sample of Greek construction firms. Kangari et al. (1992) employ a quantitative model based on financial ratios (Current ratio, total liabilities to net worth, total assets to revenues, revenues to net working capital, return on total assets, and return on net worth) to evaluate the financial performance and grade of a construction company.

Financial ratio analysis is a fundamental tool for evaluating company performance. In the paper "An Investigation Using Machine Learning," the authors have collected financial data for construction companies in Egypt, computed major ratios like the Current Ratio and Return on Equity, and then applied machine learning techniques—that is, K-means clustering—for recognising unique financial characteristics. This is trying to enhance financial performance evaluation by using sophisticated artificial intelligence techniques(Salah et al., 2021). Using descriptive statistics, tests of difference between means, and multiple linear regression, Filho et al. (2024) revealed that internationalisation negatively impacts financial performance in Brazilian companies, whereas, in European companies, the relationship between the constructs is positive.

The number of studies on how innovation or digitalisation affects the financial performance of companies, including engineering companies, has been increasing in recent years. One of the studies in question is The Role of Digitalization in Business and Management (Calderon-Monge & Ribeiro-Soriano, 2024). Another study offering an overview of digital transformation and its impact on performance in various industries, including engineering, is Digital Transformation in Business and Management Research (Kraus et al., 2022). While existing research on financial innovations, such as Bitcoin, examines their potential impact on national economies, studies highlight that, despite Bitcoin's similarities to traditional currency characteristics, its volatility and lack of centralised regulation pose significant challenges, particularly for the financial performance and stability of engineering firms in the Czech Republic and Central Europe (Vochozka et al., 2024).

Recent studies on the price development and investment potential of precious metals, such as gold, silver, and platinum, have highlighted the strategic importance of metal pairs, particularly gold-platinum, and silver-platinum, for optimising returns amidst market volatility. Given their reliance on these metals for production, this consideration could significantly influence the financial performance metrics of engineering companies in

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

the Czech Republic and Central Europe (Kunju Mol Raj et al., 2024). The analysis of the development of the financial performance of engineering companies in the Czech Republic is carried out over the last 10 years and compared through the Winsorized mean with the situation in engineering in the neighbouring countries. In this research, we used comparative analysis to evaluate the performance of engineering companies by comparing financial indicators (Debt-to-Assets Ratio, Added Value on Sales, Return on Sales, and Total Assets Turnover Ratio) among the six European Countries (Czech Republic, Hungary, Slovakia, Austria, Germany, Poland).

3. Methodological Approach

The article is based on a secondary research method, drawing on literature and data obtained from the ORBIS database. In the database, active enterprises fulfilling the following criteria were selected for further investigation: enterprises belonging to the engineering sector, operating in the selected six countries, corresponding in size to small, medium, and large enterprises according to the European Commission classification, for the selected period 2014-2023. These enterprises were subjected to an analysis of their financial performance within the selected financial ratios and then a comparison between the countries. For this paper, the following financial indicators have been selected:

3.1 Debt to Assets Ratio

The Debt-to-Assets Ratio measures the proportion of a company's assets financed by debt. It indicates the level of financial leverage used by the company. A higher ratio suggests a greater reliance on debt to finance assets, which can increase financial risk**.**

$$\text{Debt-to-Assets Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}} \qquad (1)$$

3.2 Added Value on Sales

Added Value on Sales shows how much value a company adds to its products or services relative to its total sales. "Value Added" typically refers to the difference between sales revenue and the cost of raw materials or services purchased. This ratio indicates how efficiently a company creates additional value from its sales activities.

$$\text{Added Value on Sales} = \frac{\text{Value Added}}{\text{Total Sales}} \qquad (2)$$

3.3 Return on Sales

Return on Sales (ROS) measures a company's profitability by calculating the percentage of net profit generated from total sales. It shows how efficiently a company converts sales into profit, with a higher ROS indicating better operational efficiency and profitability.

$$\text{Return on Sales (ROS)} = \frac{\text{Net Profit}}{\text{Total Sales}} \qquad (3)$$

3.4 Total Assets Turnover Ratio

The Total Assets Turnover Ratio measures how efficiently a company uses its assets to generate sales. It shows the relationship between a company’s sales and total assets, with a higher ratio indicating a more efficient use of assets to produce revenue.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

$$\text{Total Assets Turnover Ratio} = \frac{\text{Net Sales}}{\text{Total Assets}} \quad (4)$$

4. Results and Discussion

These indicators were chosen because they are interrelated and provide an essential picture of the business's financial performance. Their interconnectedness will be highlighted within each indicator. The calculated data of the indicators are processed using the aforementioned Winsorised mean. Table 1 shows the classification of entities by size based on employee count, net turnover, and total assets.

Table 1. Categorisation of the enterprises

Category of entities	Number of employees	Annual total of net turnover	Assets in total
Micro	<10 employees	<2 mil. EUR	<2mil. EUR
Small	<50 employees	<10 mil. EUR	<10 mil. EUR
Medium	<250 employees	<50 mil. EUR	<43 mil. EUR
Large	>250 employees	>50 mil. EUR	>43 mil. EUR

Source: Own processing according to European commissions

This chapter will describe the development of the indicators selected above. The following Figures present the development of selected financial indicators for the selected period within all selected states to easily compare the situation. The exact data values are then presented in the tables below the Figure.

Data for the last ten years, i.e. 2014-2023, in the engineering sector within the selected six EU countries, are analysed. There has been a considerable increase in the Return on Sales and Liabilities Turnover Ratio in the last year, which has caused the fluctuation in the below Figures (Figure 3 & Figure 4). To avoid extracting the year 2023 from the Figures, this problem has only been addressed graphically by lowering/shortening the curve in 2023 and indicating its incomplete growth to preserve the narrative value of the graph in terms of the remaining curves. This will be further commented on for the indicators concerned.

4.1 Debt-to-Assets Ratio

The first indicator where the evolution of data in the engineering sector was compared was the Debt-to-Assets ratio. The indicator is given in percentage terms.

From Table 2, it can be said that engineering enterprises in the Czech Republic show the lowest values in terms of debt, which correspond to the recommended values. Engineering enterprises in Hungary and Poland show average values. The highest debt levels are reported by engineering enterprises in Germany, and Austria and, within the V4, by enterprises in Slovakia. However, all the compared engineering enterprises show a debt ratio in the range of 40-60%, which means that the enterprises are in a range that is not considered to be risky. High indebtedness may limit the Added Value on Sales indicator in terms of increased debt and interest costs, limiting the increase in Added Value. High indebtedness could also have a negative impact on Return on Sales, but if debt is used efficiently, higher indebtedness can lead to an increase in Return on Sales. These arguments will be discussed further below.

Table 2. Debt-to-Assets ratio

Debt-to-assets ratio (%)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
CZ	45,42	43,23	43,15	43,75	43,39	42,52	42,92	44,43	44,85	39,89
SK	61,43	60,53	60,44	60,43	59,32	57,03	55,35	56,19	57,11	49,90
PL	46,25	44,91	45,40	48,32	48,57	49,56	49,80	51,43	52,11	48,54
HU	49,71	49,07	45,77	46,86	48,74	47,77	49,69	52,18	52,98	50,87
A	59,92	60,52	59,50	58,53	59,25	58,27	59,34	58,31	59,04	52,63
DE	57,86	57,66	57,63	57,92	57,99	56,94	56,72	57,44	57,16	64,22

Source: Own processing according to ORBIS

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

Figure 1 shows the graphical representation of the Debt-asset-ratio.

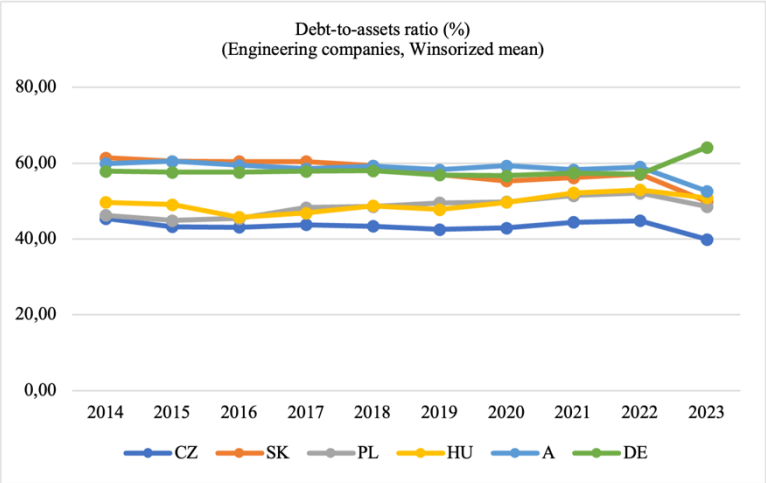


Figure 1. Debt-to-Assets ratio (Engineering)

Source: Own processing

4.2 Added Value on Sales

The next indicator where the evolution of data in the engineering sector was compared was the Added Value to Sales indicator, which is presented as a percentage. Furthermore, the Added Value on Sales indicator can also be related to the Return on Sales indicator, as higher added value leads, as a rule, to higher profitability.

Table 3 below shows that the Visegrad Group countries score lower on this indicator. The lowest values are achieved by enterprises in Poland and Slovakia. Engineering enterprises in the Czech Republic show average values of Added Value on Sales compared to the sample of enterprises surveyed. The best results are recorded for engineering enterprises in Germany and Austria. In 2023 for engineering enterprises in Hungary, the value of this indicator jumped more than twice, so we will not conclude and wait for the results from this year.

As already indicated in the context of the Debt-to-Assets ratio, these two ratios may be related if foreign capital is used to invest in machinery modernisation. This is apparent for engineering companies within Germany and Austria, where these companies perform best on this indicator despite having the highest percentage of debt. Thus, it can be concluded that these engineering enterprises can produce higher added-value products despite their higher indebtedness. The engineering enterprises in the Czech Republic have the lowest indebtedness but do not show the best but rather average results in terms of the Added Value on Sales indicator. The situation is the opposite for engineering enterprises in Poland and Slovakia, where they show the lowest values of Added Value on Sales.

Table 3. Added Value on Sales

AV/S (%)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
CZ	27,69	30,32	33,56	33,21	33,16	34,09	35,13	33,57	32,82	32,27
SK	29,82	29,05	30,89	29,34	29,83	28,89	34,04	28,07	25,21	29,84
PL	28,48	28,81	30,03	29,91	29,08	25,66	26,98	26,67	25,42	31,89
HU	30,57	31,59	31,65	31,29	31,18	31,03	33,48	32,24	30,43	68,78
A	49,33	44,03	36,16	35,52	34,50	34,53	36,50	35,77	35,27	41,02
DE	35,72	35,71	36,61	36,94	37,27	36,79	38,43	38,48	36,71	63,90

Source: Own processing according to ORBIS

Figure 2 shows the graphical representation of the Added value on sales.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

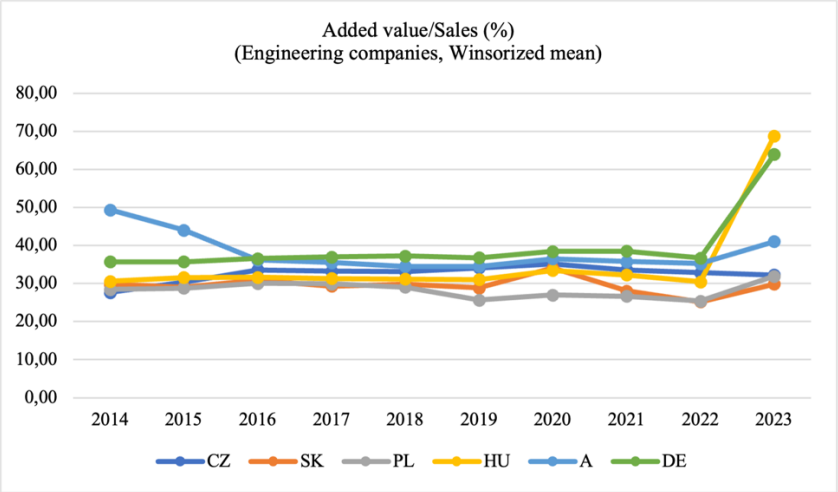


Figure 2. Added Value on Sales (Engineering)

Source: Own processing

According to the Česká spořitelna's analysis for international comparison, the Czech Republic's total added value is one of the lowest in the EU. Higher added value is preceded by business investment, as innovative products bring higher added value. Thus, it can also be clearly stated that enterprises in Germany and Austria, in addition to higher added value, also show higher investment activity.

4.3 Return on Sales (ROS)

The next indicator where the development of data in the engineering sector was compared, was profitability of sales. This indicator is given in percentage terms. As already indicated, there is a huge increase in 2023 for engineering companies in Germany and, therefore, a fluctuation, which would affect the narrative of the graph. For this reason, the Return on Sales curve for enterprises in Germany is truncated, and a further increase above the 14% threshold is indicated. The following table shows this enormous increase of 19.75%, according to the data obtained.

Table 4 shows this enormous increase of 19.75%, according to the data obtained. In terms of Return on Sales, engineering companies in the Czech Republic again show rather average values; however, in the last period, we can see an increasing tendency of this indicator, which is a positive phenomenon. The best results for Return on Sales are found in Hungary and Poland. The Hungarian companies showed a downward fluctuation last year. On the other hand, Germany and Austria show the lowest Return on Sales in the period under review until 2022.

As mentioned above, both of the previous indicators can impact the profitability of sales. It can be seen that the assumption of a negative impact of high indebtedness on ROS is met. It is the companies in Germany, Austria, and Slovakia that have the highest percentage of indebtedness and the lowest Return on Sales. Furthermore, it is noticeable that the enterprises in Hungary and Poland also have a higher percentage of indebtedness, but their ROS is the highest compared to the enterprises in Germany and Austria. In contrast, enterprises in the Czech Republic have an average ROS despite having the lowest debt burden. Another impact on Return on Sales can also be seen in the Added Value on Sales indicator, where companies in the Czech Republic again show average values in both cases compared to the monitored engineering companies in Central Europe. Higher Added Value should lead to higher profitability. These considerations are distorted by the results of the enterprises in Germany and Austria, which, despite having the highest values of the Added Value on Sales indicator, have the lowest profitability on sales among the compared enterprises in Central Europe. This refutes the directly proportional relationship between Added Value on Sales and Return on Sales. The explanation can be found in the added value itself, as companies in Germany and Austria seem to have higher added value than the V4 countries but

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

lower sales. Engineering companies in Austria and Germany show higher added value as they generally strive to invest more in innovation and new technologies than companies in the V4 countries.

As many studies have shown, the only way to increase the added value of companies in the Czech Republic is to focus on new technologies, optimisation of production processes, and the use of robots in production. On the positive side, enterprises in the Czech Republic have a lower debt level than those analysed in Germany, Austria, Poland, Slovakia, and Hungary. Therefore, there is room for using foreign capital for these investments. An increase in indebtedness may also affect a higher Return on Equity if the financial leverage is positive.

Table 4. Return on Sales

ROS (%)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
CZ	2,67	4,06	6,64	6,50	6,19	5,49	4,86	5,26	4,95	8,25
SK	5,36	5,70	5,57	5,48	5,05	4,15	4,45	5,85	5,26	6,44
PL	7,87	7,72	7,07	6,80	6,46	6,96	6,90	7,64	7,75	9,30
HU	8,25	8,32	8,94	8,54	7,99	7,98	8,07	8,71	9,85	4,55
A	6,77	6,98	4,30	4,83	4,35	4,08	4,65	5,94	5,32	7,48
DE	5,84	5,37	5,02	5,17	5,56	4,30	3,44	5,09	4,81	19,75

Source: Own processing according to ORBIS

Figure 3 shows the graphical representation of the Return Value on Sales.

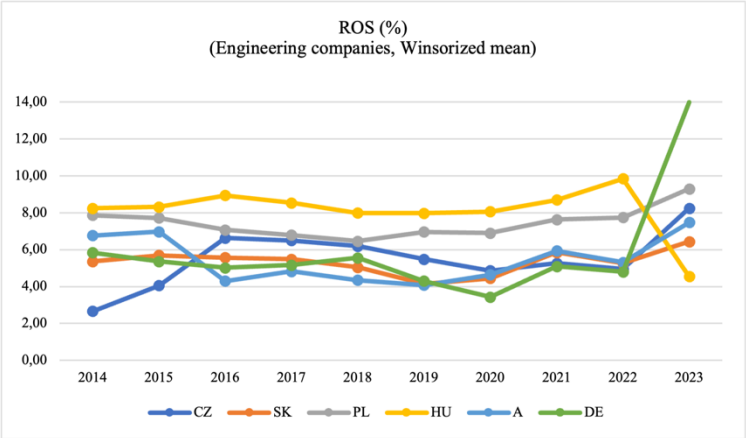


Figure 3. Return on Sales (Engineering)

Source: Own processing

4.4 Total Assets Turnover Ratio

Another indicator that is appropriate to include in this analysis of engineering companies because of their evolution is the Total Assets Turnover ratio. It is appropriate to assess the utilisation of total assets. We are aware that current assets are also included, but this indicator has a higher narrative value for comparisons between enterprises in different countries. There was a significant fluctuation in the last monitored year, 2023, especially for enterprises in Hungary, so we will not include the year.

As can be seen in Table 5, engineering companies in Germany and Austria make the best use of their total assets. The lowest values of Total Assets Turnover are achieved by enterprises in Hungary. Unfortunately, we can see that all engineering enterprises are at the lower recommended value for total asset utilisation. This indicator may be affected by the purchase of more expensive technology in the period under review, as well as by the size of inventories and receivables. The size of the inventory has been affected by the fluctuation not only in the price of steel but also by the unavailability of steel during the period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

Table 5. Total Assets Turnover ratio

Total Assets Turnover ratio (number of turns)	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
CZ	1,34	1,33	1,28	1,28	1,30	1,29	1,17	1,20	1,27	1,68
SK	1,47	1,46	1,37	1,41	1,45	1,37	1,23	1,25	1,35	1,31
PL	1,40	1,37	1,29	1,26	1,29	1,27	1,14	1,16	1,20	1,23
HU	1,42	1,36	1,30	1,24	1,24	1,27	1,06	1,09	1,14	0,56
A	1,24	1,36	1,44	1,49	1,56	1,59	1,41	1,44	1,38	1,48
DE	1,56	1,54	1,48	1,57	1,60	1,59	1,45	1,43	1,40	1,27

Source: Own processing according to ORBIS

Figure 4 shows that the total Assets turnover ratio (number of turns):

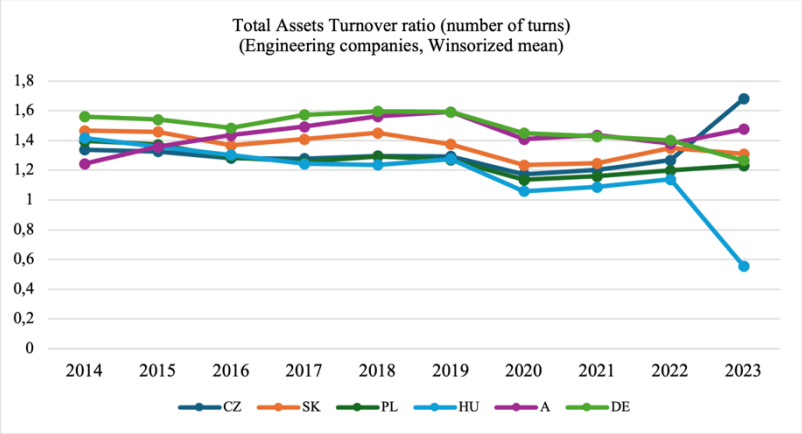


Figure 4. Total Assets Turnover ratio (Engineering)

Source: Own processing

For the Total Assets Turnover ratio, a value between 1.6 and 3 is appropriate. As can be seen in Figure 5, the price increase in the Iron Ore 62% from December 2015 to July 2021 was fivefold. Engineering companies must respond to these fluctuations. Despite these fluctuations, the Total Assets Turnover ratio has not seen significant changes. This indicator is also influenced by the setup of operations in engineering enterprises, whether single-shift or three-shift. That is, whether the machines run for 24 hours.



Figure 5. Steel market price development (USD/tonne)

Source: tradingeconomics.com

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

5. Conclusions

As already mentioned, engineering is one of the leading sectors of the national economy. The fact remains that the Czech Republic, a country belonging to the Visegrad Four countries, is at the level of the Central European average in terms of these financial indicators in the engineering field. In terms of overall indebtedness, engineering companies in the Czech Republic show better, i.e., the lowest values. This is a good finding for possible further investment in innovation and technology in these enterprises. The analyses clearly show a better position of engineering enterprises in Austria and Germany, which display a higher degree of automation and innovation, which corresponds, for example, with the results of the Added Value on Sales indicator, where these enterprises show the best results, despite the highest percentage of debt or lower profitability of sales. All enterprises analysed could also focus on monitoring asset utilisation.

High technical level, tradition, professionalism, and a certain self-sufficiency are among the strongest points of Czech engineering. Threatening factors include, on the other hand, low interest in engineering professions, especially among graduates, insufficient capital strength of Czech companies, or lower added value. Increasing added value requires constant innovation and, therefore, investment. Engineering companies in the Czech Republic should focus on increasing their added value and take inspiration from engineering companies, mainly in Germany or Austria. As it has been found, they can use foreign resources to invest in innovation.

The main trends of innovation in the field of engineering can generally be considered to be the continued expansion of robotics, automation, and digitalisation in the area of Industry 4.0. Nowadays, the use of new technologies, such as additive manufacturing technology, which represents a new quality in production, or the application of artificial intelligence or the development of cybernetics, is of growing importance. Digital technology would replace human labour in routine and arduous production processes, allow existing workers to increase their training to fill senior positions and eliminate the shortage of skilled labour.

To maintain the competitiveness of Czech engineering companies, it is therefore necessary to create production with higher added value. The Czech engineering industry has spare potential to use foreign resources to finance the necessary innovations, contributing to increased added value within the relatively low overall debt ratio compared to engineering enterprises in Germany, Austria, Poland, Slovakia, and Hungary.

References

Aigbavboa, C. O., Ebekozien, A., & Mkhize, N. (2023). An assessment of South African airlines' growth in the era of Fourth Industrial Revolution technologies: The unexplored dimension. *Journal of Facilities Management*, ahead-of-print(ahead-of-print). https://doi.org/10.1108/JFM-07-2022-0076

Ali, Z., McGreal, S., Adair, A., Webb, J. R., & Roulac, S. E. (2008). Corporate Real Estate Strategies and Financial Performance of Companies. *Journal of Property Research*, 25(3), 241-267. https://doi.org/10.1080/09599910802696722

Arias-Gomez, H. Y., & Antošová, G. (2023). Regional manufacturing in the Czech Republic. *Urban, Planning and Transport Research*, 11(1) https://doi.org/10.1080/21650020.2023.2222154

Baby, A., Mia, M. A., & Pitchay, A. A. (2024). A systematic review of financial performance in the manufacturing industry. *Future Business Journal*, 10(1), 70. https://doi.org/10.1186/s43093-024-00353-1

Brito, C., Ciampi, M., Vasconcelos, R., Amaral, L., & Barros, V. (2013, June 23). Engineering impacting social, economical and working environment. Conference. ASEE Annual Conference & Exposition https://doi.org/10.18260/1-2--19525

Buehler, M. M., Jelinek, T., & Nubel, K. (2022). Training and Preparing Tomorrow's Workforce for the Fourth Industrial Revolution. *Education Sciences*, 12(11), 782. https://doi.org/10.3390/educsci12110782

Calderon-Monge, E., & Ribeiro-Soriano, D. (2024). The role of digitalisation in business and management: A systematic literature review. *Review of Managerial Science*, 18(2), 449-491. https://doi.org/10.1007/s11846-023-00647-8

Filho, A.R.A., Garcia, E.A.D.R., & Vasconcelos, A.C.d.V. (2024). The Influence of Internationalization on the Financial Performance of Brazilian and European Companies. *Revista Gestao Organizacional*, 17(1), 6-33. https://doi.org/10.22277/rgo.v17i1

Gavurova, B., Soltes, M., & Kovac, V. (2017). Application of cluster analysis in process of competitiveness modelling of Slovak Republic regions. *Transformations in Business & Economics*, 16(3), 129-147.

Gavurova, B., Schonfeld, J., Bilan, Y., & Dudas, T. (2022). Study of the Differences in the Perception of the Use of the Principles of Corporate Social Responsibility in Micro, Small and Medium-Sized Enterprises in the V4 Countries. *Journal of Competitiveness*, 14(2), 23–40. https://doi.org/10.7441/joc.2022.02.02

Hudáková Stašová, L. (2023). Advantages and Suitability of Activity-Based Costing: A Study from Engineering Industry. *Central European Business Review*, 12(4), 1-31 https://doi.org/10.18267/j.cebr.330

Jin, Z., & Xu, J. (2020). Impact of Environmental Investment on Financial Performance: Evidence from Chinese listed Companies. *Polish Journal of Environmental Studies*, 29(3), 2235-2245. https://doi.org/10.15244/pjoes/111230

Kangari, R., Farid, F., & Elgharib, H. M. (1992). Financial Performance Analysis for Construction Industry. *Journal of Construction Engineering and ManagementList of Issues*, 118(2) https://doi.org/10.1061/(ASCE)0733-9364(1992)118:2(349)

Konkurenceschopnost analýza HK. (2022). Online. Hospodářská komora České republiky. https://www.komora.cz/app/uploads/2024/06/konkurenceschopnost_material_final.pdf

Krajicek, P., Novak, V., & Palcrova, S. (2019). Economic Performance of Manufacturing Industry of Pilsen Agglomeration. In V. Klimova & V. Zitek (Eds.), 22nd International Colloquium on Regional Sciences, (pp. 61-68). Masarykova Univ. https://doi.org/10.5817/CZ.MUNI.P210-9268-2019-7

Kraus, S., Durst, S., Ferreira, J. J., Veiga, P., Kailer, N., & Weinmann, A. (2022). Digital transformation in business and management research: An overview of the current status quo. *International Journal of Information Management*, 63, 102466. https://doi.org/10.1016/j.ijinfomgt.2021.102466

Kunju Mol Raj, R., Dlouhy, P., Kovac, V. & Turinska, L. (2024). Investing in Pairs of Precious Metals: Portfolio Theory Application. *Acta Montanistica Slovaca*, 28(v28/i4), 941-951. https://doi.org/10.46544/AMS.v28i4.12

Kuzmenko, O., Bilan, Y., Bondarenko, E., Gavurova, B., & Yarovenko, H. (2023). Dynamic stability of the financial monitoring system: Intellectual analysis. *Plos One*, 18(1), e0276533. https://doi.org/10.1371/journal.pone.0276533

Lam, W. S., Lam, W. H., Jaaman, S. H., & Liew, K. F. (2021). Performance Evaluation of Construction Companies Using Integrated Entropy–Fuzzy VIKOR Model. *Entropy*, 23(3), Article 3. https://doi.org/10.3390/e23030320

Lehenchuk, S., Raboshuk, A., Zhyhlei, I., Zakharov, D., & Fedoryshyna, L. (2023). Financial Performance Determinants of Ukrainian Agricultural Companies in the Pre-War Period. *Agricultural and Resource Economics-International Scientific E-Journal*, 9(4), 102-118. https://doi.org/10.51599/are.2023.09.04.05

Liao, Y., Ramos, L. F. P., Saturno, M., Deschamps, F., de Freitas Rocha Loures, E., & Szejka, A. L. (2017). The Role of Interoperability in The Fourth Industrial Revolution Era. *IFAC-PapersOnLine*, 50(1), 12434-12439. https://doi.org/10.1016/j.ifacol.2017.08.1248

Lukáč, J., Olexová, C., & Kudlová, Z. (2022). Factors predicting companies' crisis in the engineering industry from the point of view of financial analysis. *Plos One* https://doi.org/10.1371/journal.pone.0264016

Malichová, E., & Ďurišová, M. (2015). Evaluation of Financial Performance of Enterprises in IT Sector. Procedia Economics and Finance, 34, 238-243. https://doi.org/10.1016/S2212-5671(15)01625-1

Mehmood, S., Jabeen, R., Khan, M. A., Khan, M. A., Gavurova, B., & Oláh, J. (2023). Impact of despotic leadership and workplace incivility on innovative work behavior of employees: Application of mediation-moderation model. *Heliyon*, 9(9). https://doi.org/10.2139/ssrn.4371870

Muthuraman, B. (2020). Performance Efficiency of Engineering Industries in India. *International Journal of Research in Entrepreneurship & Business Studies*, 1(2), 44-53. https://doi.org/10.47259/ijrebs.125

Pruskova, K. (2019). Beginning of Real Wide Use of BIM Technology in the Czech Republic. IOP Conference Series: Materials Science and Engineering, 471(10), 102010. https://doi.org/10.1088/1757-899X/471/10/102010

Radonic, M., Milosavljevic, M., & Knezevic, S. (2021). Intangible Assets as Financial Performance Drivers of It Industry: Evidence from an Emerging Market. *E & M Ekonomie a Management*, 24(2), 119-135. https://doi.org/10.15240/tul/001/2021-2-008

Rajnoha, R., Gálová, K., & Rózsa, Z. (2018). Measurement of Impact of Selected Industrial Engineering Practices on Companies' Economic Performance. *Engineering Economics*, 29(2), Article 2. https://doi.org/10.5755/j01.ee.29.2.19871

Salah, O., Georgy, M., & Ragab, A. (2021). Financial ratio analysis in construction industry: an investigation using machine learning. Proceedings of International Structural Engineering and Construction, 8(1). https://doi.org/10.14455/ISEC.2021.8(1).CON-11

Schäfer, M. (2018). The fourth industrial revolution: How the EU can lead it. *European View*, 17(1), 5-12. https://doi.org/10.1177/1781685818762890

Simionescu, M. (2016). The Competition between London Companies Regarding Their Financial Performance. *Journal of Competitiveness*, 8(2), 5-16. https://doi.org/10.7441/joc.2016.02.01

Skare, M., Gavurova, B., & Kovac, V. (2023). Investigation of selected key indicators of circular economy for implementation processes in sectorial dimensions. *Journal of Innovation & Knowledge*, 8(4), 100421. https://doi.org/10.1016/j.jik.2023.100421

Skare, M., Gavurova, B., & Rigelsky, M. (2024). Quantification of the impact of innovations in industry and infrastructure for sustainable circular economy production and consumption. *Journal of Innovation & Knowledge*, 9(1), 100456. https://doi.org/10.1016/j.jik.2023.100456

Spalek, S. (2013). Improving Industrial Engineering Performance through a Successful Project Management Office. *Inzinerine Ekonomika-Engineering Economics*, 24, 88-98. https://doi.org/10.5755/j01.ee.2.24.2.3087

Stefko, R., Jencova, S., Vasanicova, P., & Litavcova, E. (2019). An Evaluation of Financial Health in the Electrical Engineering Industry. *Journal of Competitiveness*, 11(4), 144-160. https://doi.org/10.7441/joc.2019.04.10

Svatos, M. (2009). Zahraniční obchod: teorie a praxe. Praha: Grada. ISBN 978-80-247-2708-0.

Tehrani, R., Mehragan, M., & Golkani, M. (2012). A Model for Evaluating Financial Performance of Companies by Data Envelopment Analysis—A Case Study of 36 Corporations Affiliated with a Private Organization. *International Business Research*, 5. https://doi.org/10.5539/ibr.v5n8p8

Tengilimoğlu, D., Tümer, T., Bennett, R. L., & Younis, M. Z. (2023). Evaluating the Financial Performances of the Publicly Held Healthcare Companies in Crisis Periods in Türkiye. *Healthcare*, 11(18), Article 18. https://doi.org/10.3390/healthcare11182588

Tkacova, A., & Gavurova, B. (2023). Economic sentiment indicators and their prediction capabilities in business cycles of EU countries. *Oeconomia Copernicana*, 14(3), 977-1008. https://doi.org/10.24136/oc.2023.029

Tradingeconomics.com. (2023). *Steel Market Price Development.* From: https://tradingeconomics.com/commodity/ironore62

Tsolas, I. (2020). Financial Performance Assessment of Construction Firms by Means of RAM-Based Composite Indicators. *Mathematics*, 8, 1347. https://doi.org/10.3390/math8081347

Váně, J., Kalvas, F., & Basl, J. (2021). Engineering companies and their readiness for Industry 4.0. *International Journal of Productivity and Performance Management*, 70, 1072-1091. https://doi.org/10.1108/IJPPM-06-2020-0318

Vochozka, M., Skoda, M., Kunju Mol Raj, R. & Blahova, A. (2024). Bitcoin as a National Currency: A Case Study for the Czech Republic. *Acta Montanistica Slovaca*, 29(v29/i1), 13–25. https://doi.org/10.46544/AMS.v29i1.02

Author Contributions: All authors contributed equally. All authors have read and agreed to the published version of the manuscript.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/p3627979668

Josef BUREŠ, MSc, MBA, is affiliated with the Faculty of Business and Management at Brno University of Technology, specifically within the Department of Finances in Brno, Czech Republic. His research interests center on corporate finance. In addition to his academic role, Bureš serves as the Chairman of the Board of Directors at NC Line a.s., a significant leadership position within the company. His dual roles in academia and industry provide him with a practical and theoretical perspective on financial management in corporate settings.
ORCID ID: https://orcid.org/0009-0008-4848-9649

Nikola SOBOTKOVÁ is a faculty member at the Faculty of Business and Management, Brno University of Technology, located in Brno, Czech Republic. She is part of the Department of Finances, where her work focuses on corporate finance and controlling. Her research interests include studying financial strategies, management practices, and controlling mechanisms within businesses. Sobotková contributes to both academic research and the practical application of financial management theories. Through her work, she supports the development of efficient financial practices in corporate environments.
ORCID ID: https://orcid.org/0009-0002-6042-7543

Vojtěch BARTOŠ serves as the Dean of the Faculty of Business and Management at Brno University of Technology in Brno, Czech Republic. In addition to his administrative role, he is a senior researcher and associate professor in the Department of Finances. His academic focus is on corporate finance and the financial and economic analysis of enterprises. Bartoš is deeply involved in both teaching and research, contributing to the understanding of financial dynamics in business settings. His expertise supports the development of strategies for financial management and analysis in enterprises.
ORCID ID: https://orcid.org/0000-0002-2984-275X

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

Publisher
http://jssidoi.org/esc/home

ONLINE REPUTATION OF TRAVEL AGENCIES: AN EMPIRICAL STUDY ON THE CZECH MARKET*

Michal Konečný [1]*, Kateřina Kutová [2], Radim Dušek [3], Daniel Chamrada [4,5]

[1,2,3] Institute of Technology and Business in České Budějovice, Faculty of Corporate Strategy, Department of Tourism and Marketing, Okružní 517/10, 370 01 České Budějovice, Czech Republic*
[4] University of Žilina, The Faculty of Operation and Economics of Transport and Communications, Department of Economics, Univerzitná 8215, 010 26 Žilina, Slovak Republic
[5] Institute of Technology and Business in České Budějovice, Faculty of Corporate Strategy, Department of Management, Okružní 517/10, 370 01 České Budějovice, Czech Republic

E-mails:[1] michal.konecny@mail.vstecb.cz (Corresponding author); [2] 29099@mail.vstecb.cz; [3] dusek@mail.vstecb.cz; [4,5] chamrada@mail.vstecb.cz*

Received 18 July 2024; accepted 10 November 2024; published 30 December 2024.

Abstract. The article aims to analyse the online reputation of six selected travel agencies in the Czech Republic and identify the crucial factors behind the commonly held opinions. The chosen agencies include Blue Style, Fischer, Exim Tours, Čedok, České kormidlo and Alexandria, using descriptive analysis, content analysis and analysis of variance. The reviews cover websites like Mapy.cz, Mahalo.cz, RecenzieCestovie.sk and Google reviews from 2019 through 2023, revealing dramatic changes in opinions in the event of Blue Style, Fischer, Čedok, České kormidlo and Alexandria through the monitored period. Our results are much appreciated by agency owners, offering a deep insight into customer requirements varying in time. The critical factors behind the reputation involve the services offered, transport, quality of couriers, customer service and staff, and vary in significance throughout the agencies. The analysis of variance unveiled differences in the average rating in various periods, i.e. before, during and after the Covid-19 pandemic. Exim Tours was the only exception, indicating a stable average rating. The study is limited by a potential bias in the customer reviews, possibly written by the employees or owners of the agencies. Our outcomes may contribute to strategic planning service improvement, deepening the understanding of the intrinsic factors affecting customer satisfaction and loyalty.

Keywords: tourism; online reputation; reviews; travel agencies; key factors

Reference to this paper should be made as follows: Konečný, M., Kutová, K., Dušek, R., Chamrada, D. 2024. Online reputation of travel agencies: an empirical study on the Czech market. *Entrepreneurship and Sustainability Issues*, 12(2), 275-294. http://doi.org/10.9770/r5543285992

JEL Classifications: M14, M21, M31

1. Introduction

Consumer behaviour in travel agencies is subject to many factors, including evident and hidden biases relating to consumer ethnocentrism. Strong ethnocentrism may discourage customers from purchasing products from abroad (Kim & Hyun, 2024). COVID-19 pandemic and global armed conflicts dramatically altered consumer behaviour in tourism, emphasising safety, emotions, hospitability and the quality of services (Krupenna & Kokhan, 2022; Pollák et al., 2022; Markovič et al., 2022; Straková, Talíř & Váchal, 2022; Vochozka,

* *This article is one of the partial outputs of the currently solved research project IVSUPS2305. This research was funded by the Institute of Technology and Business in České Budějovice, grant number IVSUPS2305*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

Neuschlová & Janíková, 2023; Vochozka, Novotná & Borovková, 2022; Bartoš, Vochozka & Šanderová, 2022; Pollák et al., 2021; Straková et al., 2021; Vochozka et al., 2021; Vochozka et al., 2020). The research on tourists' preferences in the market of travel agencies indicates that previous travel habits, a need for rest and a desire for unforgettable experiences are powerful stimuli (Gavurova et al. 2020). Good post-purchase communication, prompt responses and pleasing websites are imperative for enticing and keeping customers (Mazurek-Kusiak, 2022; Gavurova et al. 2021). Vacationers plan their holiday according to demographic and social variables, including age, marital status and financial circumstances in online and offline purchases (Dudek, Jaremen & Michalska-Dudek, 2023). Travel agencies should understand these determinants to keep customers satisfied and loyal. Our thesis analyses the online reputation of six selected travel agencies in the Czech Republic, including Blue Style, Fischer, Exim Tours, Čedok, České kormidlo and Alexandria. The study explores changes in their rating, expressed by the number of stars on multiple websites, while identifying the determining factors and unveiling whether the rating was subject to change through the periods. We formulated three research questions: What are the key factors behind the customers' preferences of individual travel agencies? Did customers change their opinion between January 2019 and December 2023? Is the average rating of the travel agencies variable before, during and after the Covid-19 pandemic?

2. Theoretical background

Travel agencies employ many marketing strategies to attract customers, promoting a positive image via consumer sentiment analyses (Isya', Suratno & Azzam, 2023; Dorčák, Markovič & Pollák, 2017). They also encourage word-of-mouth marketing when consumers discuss their products and services in daily dialogues (Roberts-Lombard& Steyn, 2022; Ivaniova et al., 2021), and use social networking sites to communicate and interact with customers (da Silva et al., 2021; Dorčák, Štrach &Pollák, 2015). Tourism relies heavily on marketing to promote services, raise customer awareness and offer generous discounts to win their loyalty (Ganatra et al., 2021; Gavurova et al., 2023). The strategies involve complete product packages, competitive prices, special offers and efficient usage of social media platforms in the local language to address a vast audience (Isya', Suratno & Azzam, 2023). The agencies run promotional campaigns on social networking sites and cooperate with influences. They also engage in traditional marketing ventures, including radio advertisements and billboards, to gain exposure and entice customers (da Silva et al., 2021). The effective combination of these strategies may attract and poach customers from competitive markets. Positive reviews are vital to business success, influencing consumers' decisions (Kamble et al., 2020; Skare et al., 2023). Online reviews of travel agencies provide a clear picture of hotels, encouraging or disheartening readers based on the comments' volume, value and quality (Kamble et al., 2020). A sentiment analysis like DC-CBLA helps gather valuable information from reviews on travelling and better understand consumer emotions to improve services (Li et al., 2023). The effective management and interpretation of online comments are imperative to entice customers, acquire an unrivalled reputation and corner the market (Straková &Kostiuk, 2023; Ruschak et al., 2023). Anindita et al. (2023) argue that negative reviews may reveal grey areas that need improvement, including poor management, faulty refund systems and other errors. These findings help travel agencies improve their services and win customer loyalty. Li et al. (2023) suggest that sentiment analysis is essential for understanding consumer emotions. According to Rezvani & Rojas (2022), reacting to reviews also plays an important role in online reputation. Responding to the comments improves your customer rating. Hamdan et al. (2022) identified factors like the platform features and personal motivation contributing to the status. The active reactions to customer feedback and solving their problems may earn a good reputation, win customer loyalty, and give a competitive advantage. Travel agencies use many tools for receiving and analysing the feedback, including online surveys, social media like Twitter and advanced technologies like artificial intelligence and machine learning (Vasquez et al., 2023; Efthymiou & Orphanidou, 2022; Fardeen et al., 2023; Ramnarayan et al., 2022). Travel agencies may also employ sentiment analysis, assess consumer mindset, detect grey areas and tailor the services to customer needs (Fardeen et al., 2023). The tools for receiving feedback involve Net Promoter Score (NPS) and Customer Satisfaction Index (CSI), measuring customer loyalty and satisfaction, giving Mriya Resort & SPA as an example (Gurov, 2022). This complex approach allows travel agencies to promptly deal with problems and improve customer services, leading to intense customer loyalty and satisfaction. Travel agencies employ many methods for receiving customer feedback, including traditional channels like paper and electronic questionnaires, comment cards, oral feedback, suggestion boxes and telephonic surveys and modern platforms like e-mail and physical surveys, travel booking and travel rating

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

platforms (Efthymiou & Orphanidou, 2022). Some agencies use online travel agencies for data on customer satisfaction ratings via the SERVQUAL questionnaire, sentiment analysis and nonprobability sampling design and analyse them in Microsoft Excel (Vasquez et al., 2023).

On the other hand, airlines use social media like Twitter to assess consumer sentiment, identify grey areas and tailor the services to customer needs, applying sentiment analysis and classification like Support Vector Machine and Naïve Bayes (Fardeen et al., 2023). Agencies in Western Cape province try to establish close relationships with strategic contractors to improve customer satisfaction and stimulate the word-of-mouth environment (Roberts-Lombard & Steyn, 2022). Lastly, online travel agencies acquire their reputation via online services on their websites, mobile applications and social media, cleverly swaying customer booking intentions through many factors, including political instability (Chen, Kamalanon & Janupiboon, 2022).

3. Research objective and methodology

This thesis analyses the online reputation of six selected travel agencies in the Czech Republic, including Blue Style, Fischer, Exim Tours, Čedok, České kormidlo and Alexandria. Our study aims to identify key factors influencing their online reputation using descriptive analysis, content analysis and analysis of variance. The examined reviews involve Czech and foreign customers, gathering data from the following websites: Blue Style, Fischer, Exim Tours and Čedok from Mapy.cz, Mahalo.cz and RecenzeCestoviek.sk; for České kormidlo from Mapy.cz and Recenze Cestoviek.sk; and for Alexandria from Mapy.cz, Mahalo.cz and Google reviews. We apply content analysis to the first research question concerning critical factors affecting online reputation. The reviews observe the aspects identified as the key determinants for choosing the travel agency. The second question explores and examines the changes in customer opinions from January 2019 through December 2023. The average star rating goes to MS Excel, undergoing the calculation of averages for separate years displayed in a graph for each travel agency. The third research question compares the average rating of the agencies before, during and after the COVID-19 pandemic, including three separate periods: 2019 (before the pandemic), 2020-2021 (during the pandemic) and 2022-2023 (after the pandemic). MS Excel involves graphs and analysis of variance to assess the statistical significance of the differences between the periods at the level of importance of 5% using the ANOVA function, i.e. MS Excel factor containing an analysis of rating variability over individual periods.

4. Results

4.1. Blue Style Travel Agency

The first part of the thesis involved the content analysis of the Blue Style travel agency, including 224 reviews published from January 2019 through December 2023. As five reviews did not contain a verbal assessment, the total comprised 219 comments from the following sources: 100 reviews from Mapy.cz, 9 from Mahalo.cz and 115 from RecenteCestoviek.sk. Reviewers were the most prolific in June, July, August, September and October, providing eight critical factors: courier, transport, offer, customer service, staff, location, websites and price. The offer was the most discussed aspect, appearing in 73 reviews, followed by a courier (62 comments) and transport (60 comments). Staff appeared in 57, and customer service in 50 reviews. The office location was discussed in three comments, while websites appeared only once. Absolute frequency shifted to a relative frequency, expressed in per cent. The relative frequency of websites and prices was 0.32%, office location 0.98%, staff 18.57%, customer service 16.29%, courier 20.20% and transport 19.54%. The offer was the most frequent determinant, showing 23.78% relative frequency. 224 reviews contained 118 negative ones, indicating 53.88% of the total opinions. People mostly complained about accommodation, which did not match the expectations from the photos or poor service. Other issues concerned couriers' unwillingness to deal with customer complaints or being completely inaccessible. Clients also criticised customer service, namely handling customer complaints and, to a lesser extent, transport. Positive reviews equalled 46.12% of the total analysed opinions.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

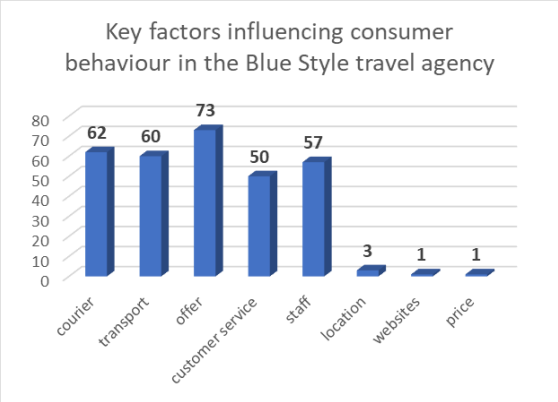


Figure 1. Key factors influencing consumer behaviour in the Blue Style travel agency
Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The second part focuses on evaluating customers of the Blue Style travel agency. The analysis deals with developing the average number of stars from a total of 224 reviews awarded between 2019 and 2023. In 2019, the office received 8 reviews with an average rating of 3.3 stars. 13 reviews were added in 2020 with an average of 2.57 stars. In 2021, the average increased to 3.21 stars from 17 reviews, an increase of 0.64 stars. In 2022, the office received 75 reviews with an average rating of 2.83 stars. 2023 had the most reviews at 111 with an average rating of 2.71 stars. The overall average rating for Blue Style over the entire period under review is shown in red in Figure 2 and is 2.8 stars. This average is based on reviews on the websites Mapy.cz, Mahalo.cz and RecenzeCestovek.cz for the years 2019 to 2023.

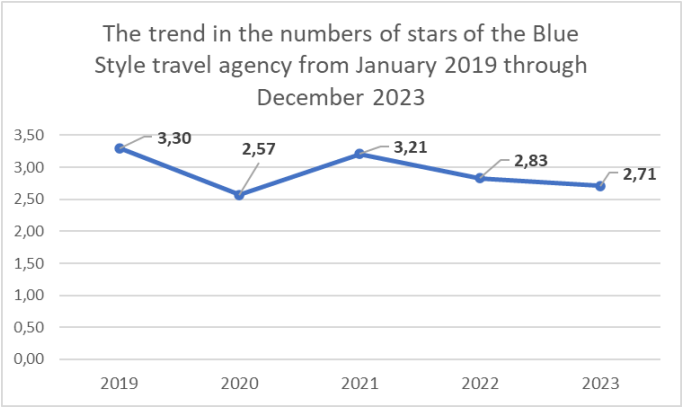


Figure 2. The trend in the numbers of stars of the Blue Style travel agency from January 2019 through December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The next part focuses on the overall average of stars received by the Blue Style travel agency in three different periods: before the pandemic (year 2019), during the COVID-19 pandemic (years 2020 and 2021) and now (years 2022 and 2023). 8 reviews were analysed for 2019, 30 reviews for the pandemic period and 186 reviews for the current period from the websites Mapy.cz, Mahalo.cz and RecenzeCestovek.cz. As shown in Figure 3, the average rating gradually decreased during these periods. Before the pandemic, Blue Style had an average rating of 3.30 stars. During the COVID-19 pandemic, this average decreased by 0.37 stars to 2.93. Currently, in 2022 and 2023, the average rating has dropped to 2.76 stars, representing a decrease of 0.17 stars compared to the pandemic period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

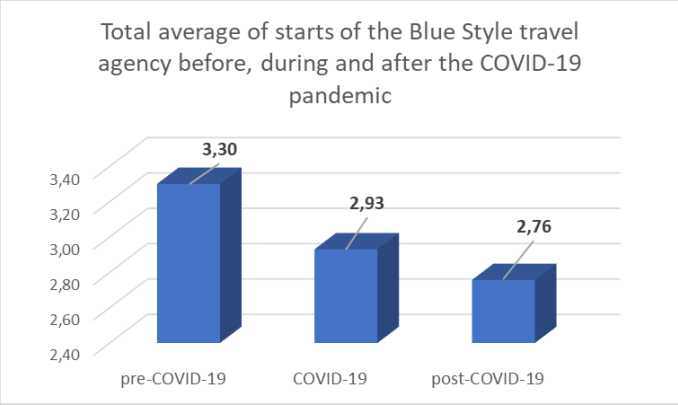


Figure 3. Total average of starts of the Blue Style travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

In addition to comparing the average rating for individual periods, we conducted an analysis of variance (ANOVA) from the reviews in the MS Excel program. The null hypothesis in this analysis states that the mean rating of Blue Style travel agency differs pre-pandemic, during the COVID-19 pandemic, and now. The alternative hypothesis assumes that the average rating does not differ between these periods. As shown in Table 1 below, the P value is 0.610214, corresponding to approximately 61.02%. Compared to the significance level, which is set at 5%, the P value is much higher. The null hypothesis is confirmed, and the average rating differs between periods. We reject the alternative hypothesis.

Table 1. Analysis of variance of the Blue Style travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selections	2.86	2	1.429782	0.495052	0.610214	3.03671
All selections	638.28	221	2.888146			
Total	641.14	223				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

4.2. Fischer Travel Agency

First, we conducted a content analysis of reviews of the Fischer travel agency, analysing 137 reviews published between January 2019 and December 2023, of which 11 did not contain any verbal rating. The resulting analysis focused on 126 customer reviews. Nine reviews were analysed from the Mahalo.sk website, 20 reviews from Mapy.sk and 108 reviews from RecenzeCestoviek.sk. Most reviews were added in July, August and September. Based on customer reviews, seven key factors were identified: offer, courier, staff, customer service, transport, price and location. Customers mentioned transportation the most, which was mentioned 35 times, closely followed by courier, which was mentioned 33 times. The supply factor was mentioned 29 times. Other factors mentioned were customer service (17 times), staff (13 times), price (1 time) and location (1 time). These factors are also graphically represented in Figure 4. Conversion to relative frequency shows that transport had the largest share, 27.13%. The courier had a share of 25.58%, offer 22.48%, customer service 13.17%, staff 10.08% and price with location 0.78% each. Of the total of 137 reviews, 78 were negative, which represents 61.90%. Negative reviews often mentioned poor communication with customer service and disrespectful behaviour from couriers. Other problems included unrealistic expectations regarding hotels and, to a lesser extent, transportation. Positive reviews represented 38.10% of the analysed reviews on Mapy.cz, Mahalo.cz and RecenzeCestovek.cz.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

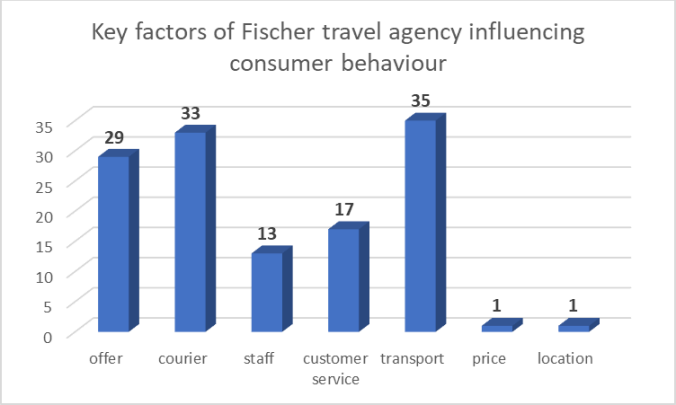


Figure 4. Key factors of Fischer travel agency influencing consumer behaviour

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The second part focuses on the evaluation of Fischer Travel Agency customers. Here is an analysis of the average number of stars from a total of 137 reviews awarded in the period 2019-2023. In 2019, the office received 23 reviews with an average rating of 2.89 stars. In 2020, six reviews were added, with an average of 1.98 stars. In 2021, the average rating increased to 2.38 stars from 17 reviews. In 2022, the travel agency received 53 reviews with an average rating of 2.10 stars. In 2023, it received 38 reviews with an average of 2.05 stars. Figure 5 shows the overall average rating of the Fischer travel agency, which was 2.25 stars for the entire period on the Mapy.cz, Mahalo.cz and RecenzeCestovek.cz websites.

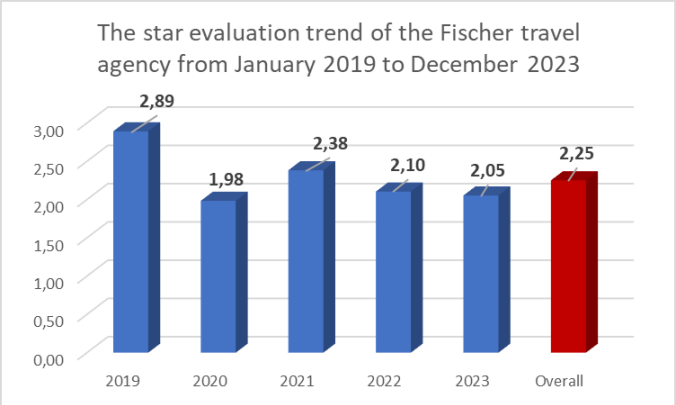


Figure 5. The star evaluation trend of the Fischer travel agency from January 2019 to December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The next part focuses on the average rating of the Fischer travel agency in three time periods: before the pandemic (year 2019), during the pandemic (years 2020 and 2021), and now (years 2022 and 2023). Twenty-three reviews were analysed for 2019, another 23 reviews for the period of the COVID-19 pandemic, and 91 reviews for the present from the sites Mapy.cz, Mahalo.cz and RecenzeCestovek.cz. As Figure 6 shows, the average rating gradually decreased during these periods. In 2019, the Fischer travel agency had an average rating of 2.89 stars. During the COVID-19 pandemic, the average dropped by 0.61 stars to 2.28. In 2022 and 2023, which is now, the rating has fallen to 2.08 stars, a drop of 0.20 stars compared to the pandemic period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

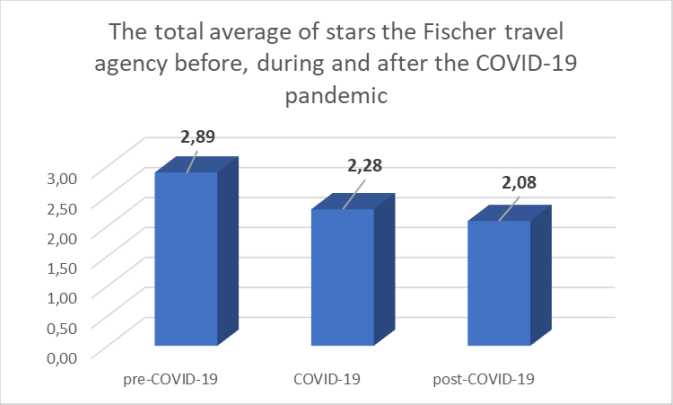


Figure 6. The total average of stars the Fischer travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

In addition to comparing the overall average for individual periods, an analysis of variance, also known as ANOVA, was performed from the reviews in the MS Excel program. The null hypothesis states that the average rating of the Fischer travel agency differs in the period before the pandemic, during the pandemic and now. An alternative hypothesis states that the average rating of the Fischer Travel Agency does not differ in these periods. Table 2 shows that the P value is 0.0603549, which is approximately 6.04%. Compared to the significance level, which is set at 5%, the P value is higher. The null hypothesis is valid, indicating that the mean rating does differ between the pre-pandemic period, during the pandemic period, and now. The alternative hypothesis is therefore rejected.

Table 2. Analysis of variance of the Fischer travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selection	12.03	2	6.016538	2.867165	0.0603549	3.063715
All selections	281.19	134	2.098427			
Total	293.22	136				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

4.3. EXIM tours Travel Agency

First, we conducted a content analysis of the reviews of the travel agency Exim Tours. The total number of analysed reviews from January 2019 to December 2023 is 132, of which 16 reviews did not contain any verbal evaluation. Therefore, we examined only 116 reviews, including six reviews from Mahalo.cz websites, 49 reviews from Mapy.cz and 77 reviews from RecenzeCestovek.cz. Most reviews were added in August, September and October. The reviews observed five key factors: offer, courier, staff, customer service and transport. Exim Tours customers most often mentioned transportation, showing positive evaluation in 34 cases. Other significant factors were customer service (29 reviews) and courier (25 reviews), as shown in Figure 7. The range of tours to various destinations was appreciated by 24 customers and the quality of the staff by 20 reviews. Absolute frequencies were converted to relative values. The total number of mentions is 132. Transport has the highest representation with 25.76%, supply at 18.18%, personnel at 15.15%, customer service at 21.97% and courier at 18.94%. A total of 89 reviews out of 116 were negative, which is 76.72%. Customers complained the most about customer service, which did not respond to administrations and refund requests. There were also problems with couriers who were not present or had rude communication with customers and with the lengthy and uncomfortable transport. There were a smaller number of complaints about misleading hotel photos. Positive reviews made up 23.28%.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

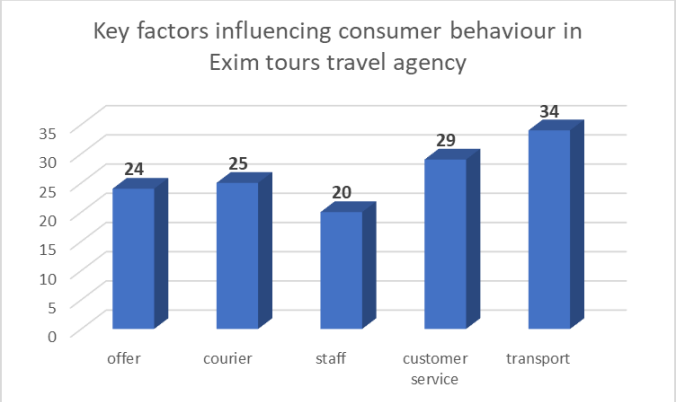


Figure 7. Key factors influencing consumer behaviour in Exim tours travel agency

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The next part focuses on customer ratings using the number of stars for the Exim Tours travel agency. The development of the average number of stars from the total number of 132 reviews awarded by customers in the years 2019-2023 is investigated. In 2019, the office received 12 reviews with an average rating of 3.90 stars. The following year, Exim Tours received four reviews with an average rating of 1.88 stars. In 2021, the average rating increased by 0.20 stars to 2.08 from 17 reviews. In 2022, the office received 2.32 stars from 62 reviews. In 2023, 37 reviewers gave an average of 2.28 stars. Figure 8 shows in red the overall average rating of the travel agency Exim Tours for 2019-2023, which is 2.41 stars on the websites Mapy.cz, Mahalo.cz and RecenzeCestovek.cz.

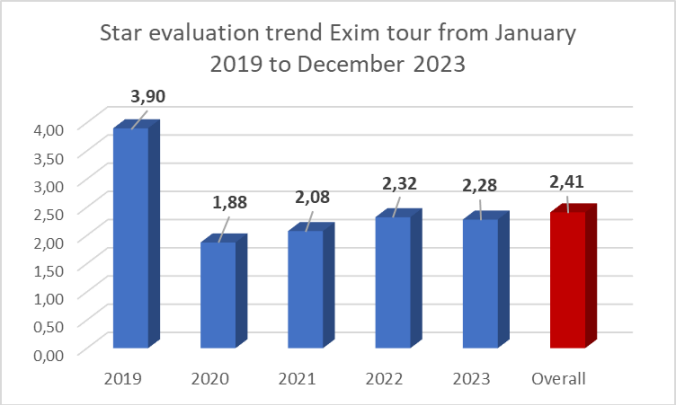


Figure 8. Star evaluation trend Exim tour from January 2019 to December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The third part deals with the average star rating of the Exim Tours travel agency in three periods: before the pandemic (year 2019), during the COVID-19 pandemic (years 2020 and 2021) and now (years 2022 and 2023). We analysed 12 reviews from 2019, including twenty-one customer reviews from the COVID-19 period and 99 post-pandemic reviews from Mapy.cz, Mahalo.cz and RecenzeCestovek.cz were reviewed. Figure 9 shows that the average rating decreased in individual periods. Before the pandemic, Exim Tours had an average rating of 3.90 stars. During the COVID-19 pandemic, this average dropped by 1.86 stars to a rating of 2.04. In 2022 and 2023, the current period, the average rating rose to 2.31 stars, a slight increase of 0.27 stars from the pandemic period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

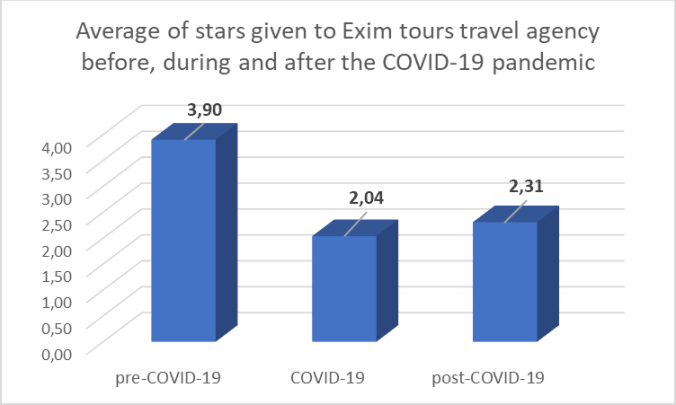


Figure 9. Average of stars given to Exim tours travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

In addition to the overall average for individual periods, a variance analysis was made from the reviews in the MS Excel program. The null hypothesis states that the average rating of Exim Tours travel agency before, during the COVID-19 pandemic and nowadays is different. The alternative hypothesis assumes that the average rating does not differ in these periods. Table 3 shows the P value, indicating 0.0011144, or approximately 0.11%. Compared to 5% significance level, the P value is significantly lower. The results show that the null hypothesis is rejected and the alternative hypothesis is that the average rating of the travel agency before, during, and after the pandemic does not differ.

Table 3. Analysis of variance of the Exim tours travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selections	30.59	2	15.29726	7.170731	0.0011144	3.066391
All selections	275.19	129	2.13329			
Total	305.79	131				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

4.4. Čedok travel agency

In the introductory part, we analysed the reviews of the Čedok travel agency, including 291 from January 2019 to December 2023. Twenty-two reviews did not contain verbal evaluation, subjecting only 269 reviews to a content analysis. We selected 94 reviews from Mapy.cz, seven from Mahalo.cz and 190 reviews were found on RecenzeCestovek.cz. Most online customer reviews appeared in July, August and September. The reviews observed five key factors: offer, courier, staff, transport and customer service. Customers of the Čedok travel agency most often mentioned the courier factor, which occurred 90 times. Other frequent factors included transport (71 times) and staff (60 times). The quality and wide range of tours appeared 49 times, and customer service occurred in 28 reviews, as shown in Figure 10. Factors such as location, price and website were completely absent. Absolute frequencies are converted to relative: courier (30.20%), transport (23.83%), offer (16.44%), staff (20.13%) and customer service (10.08%). Of the total number of 291 reviews, 169 were negative. Customers complained most about hotel accommodation and meals that did not match the photos and services offered, an unwilling or unavailable courier and customer service issues, particularly about claims and refunds for cancelled tours. They also cited problems with transportation. The total number of negative reviews is 169, which is 62.83% of the analysed reviews. The number of positive customer reviews is 37.17%.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

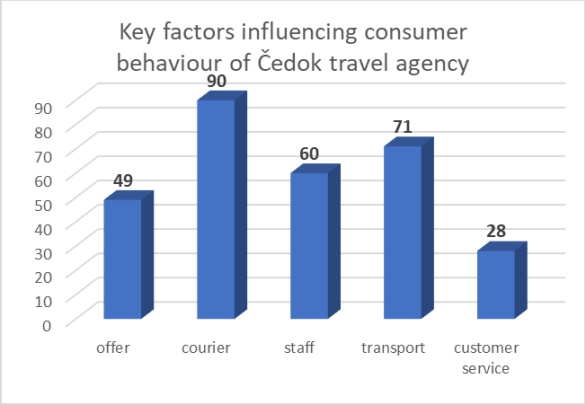


Figure 10. Key factors influencing consumer behaviour of Čedok travel agency

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The second part focuses on the customer opinions on the Čedok travel agency. Here is an analysis of the evolution of the average number of stars from the total number of 291 reviews given by customers in 2019-2023. In 2019, the travel agency received 25 reviews with an average rating of 2.93 stars. In the following year, 2020, Čedok received 10 reviews with an average rating of 1.77 stars. In 2021, the average rating increased to 2.66 stars from 38 reviews. In 2022, the travel agency received 104 reviews with an average rating of 2.83 stars. In 2023, Čedok received the highest number of reviews, 114, with an average rating of 2.57 stars. Figure 11 shows the overall average rating of the Čedok travel agency over 2019–2023, which is 2.68 stars from the websites Mapy.cz, Mahalo.cz and RecenzeCestovek.cz.

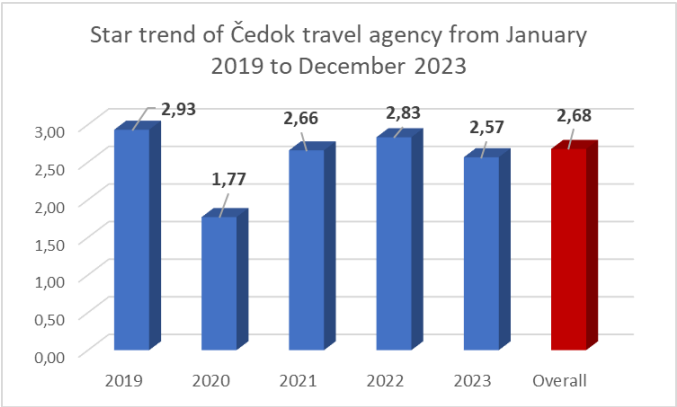


Figure 11. Star trend of Čedok travel agency from January 2019 to December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The next part focuses on the overall average of the stars of the Čedok travel agency in three periods: before the pandemic (2019), during COVID-19 (years 2020 and 2021) and now (years 2022 and 2023). We analysed 25 reviews for 2019, 48 for the COVID-19 pandemic, and 218 for the post-pandemic period from Mapy.cz, Mahalo.cz and RecenzeCestovek.cz. Figure 12 shows that the average rating decreased in individual periods. In the period before the pandemic, Čedok had an overall average of 2.93 stars. During COVID-19, the average dropped by 0.46 stars to 2.47. In 2022 and 2023, the average rose to 2.69 stars, indicating an increase of 0.22 stars compared to the COVID-19 pandemic.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

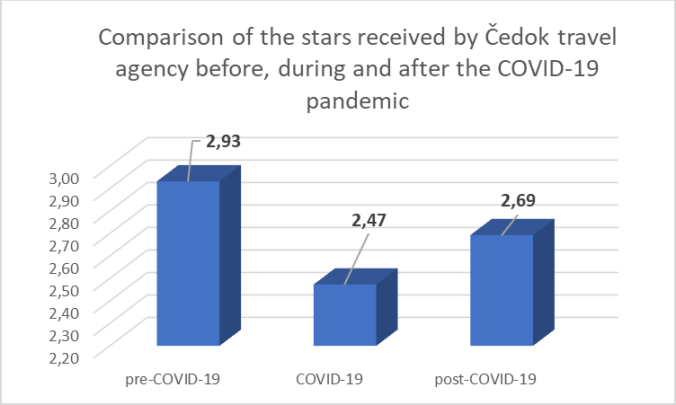


Figure 12. Comparison of the stars received by Čedok travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

On top of comparing the overall average for individual periods, an analysis of variance (ANOVA) of the reviews of the Čedok travel agency was performed in the MS Excel program. The null hypothesis claims that the average ratings of Čedok in the period before the pandemic, during COVID-19 and now are different. On the other hand, the alternative hypothesis claims that the average ratings of Čedok in these periods are the same. Table 4 shows the P value of 0.5215341, indicating approximately 52.15%. This P value is significantly higher than the specified 5% significance level, indicating insufficient evidence to reject the null hypothesis. It means that the average ratings of the Čedok travel agency before the pandemic, during COVID-19 and nowadays are similar, denying the alternative hypothesis.

Table 3. Analysis of variance of Čedok travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selections	3.68	2	1.839145	0.652454	0.521534	3.027111
All selections	811.82	288	2.818811			
Total	815.50	290				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

4.5. České kormidlo travel agency

In the first part, a content analysis of the reviews of the travel agency České kormidlo is carried out. The total number of reviewed reviews published from January 2019 to December 2023 is 117. Only 21 reviews did not contain verbal ratings, so 96 customer reviews were subject to content analysis. Ninety-one opinions involved the Mapy.cz website and 26 from the RecenzeCestovek.cz website. Most customer reviews came from June, July, August and September. The reviews reflected six key factors: offer, staff, transport, customer service, courier and price. The most frequently mentioned factor was the offer, mentioned in 38.84% of the reviews. Other factors concerned transportation (26.21%) and courier (23.30%). Negative reviews accounted for 50.55% of all analysed reviews, where customers most often criticised inadequate accommodation, the unavailability of a courier and the organisation of tour guides. On the contrary, positive reviews made up 49.45% of the total reviews.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

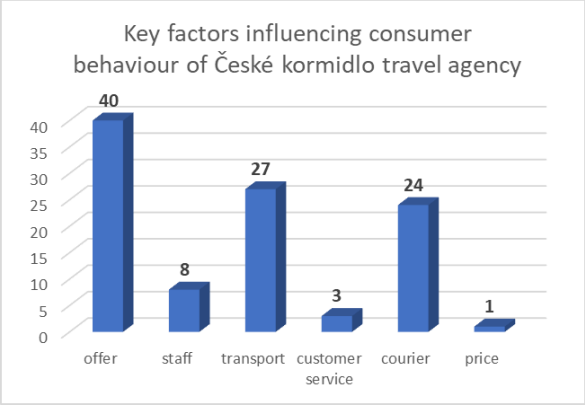


Figure 13. Key factors influencing consumer behaviour of České kormidlo travel agency

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The second part focuses on the customer evaluation of the České kormidlo travel agency. Here is an analysis of the evolution of the average number of stars from the total number of 117 reviews given by customers for the period 2019-2023. In 2019, ten reviews were added to the office with an average rating of 3.40 stars. A year later, there were six reviews with an average of 2.67 stars. In 2021, the average increased to 4.14 stars with 11 reviews. In 2022, the office received a rating of 2.42 stars out of 37 reviews. The year 2023 saw the highest number of reviews, 53, with an average rating of 3.01 stars. Figure 14 shows the overall average of the Česká kormidlo travel agency, which represented 2.94 stars on the Mapy.cz and RecenzeCestoviek.sk websites for 2019–2023.

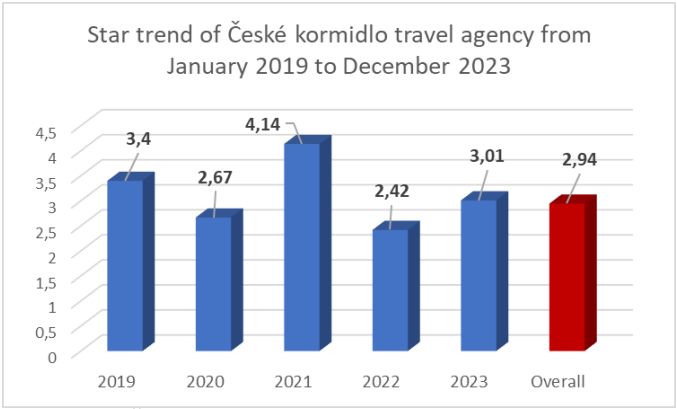


Figure 14. Star trend of České kormidlo travel agency from January 2019 to December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

The last part analyses the overall average rating of the České kormidlo travel agency in three time periods: before the pandemic (year 2019), during the COVID-19 pandemic (years 2020 and 2021) and now (years 2022 and 2023). Ten reviews were considered from 2019, 17 reviews from the period of the COVID-19 pandemic, and currently 90 reviews from the websites Mapy.cz and Mahalo.cz. Figure 15 shows that the average rating decreased in individual periods. In the period before the COVID-19 pandemic, the overall average rating of the travel agency České kormidlo reached 3.40 stars. During the COVID-19 pandemic, this average increased by 0.22 stars to 3.62. In 2022 and 2023, the average rating dropped to 2.77 stars, a decrease of 0.85 stars from the COVID-19 pandemic period.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

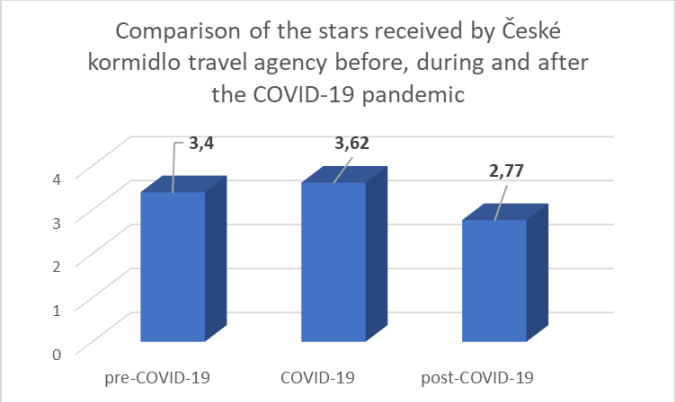


Figure 15. Comparison of the stars received by České kormidlo travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

In addition to comparing the overall rating average for individual periods, an analysis of variance (ANOVA) was performed based on the available reviews in the MS Excel program. The null hypothesis in this analysis claims that the average rating of the travel agency České kormidlo differs in the period before the pandemic, during the COVID-19 pandemic and now. The alternative hypothesis, on the other hand, claims that the average rating does not differ in these periods. Table 5 shows that the P value is 0.1584195, corresponding to approximately 15.84%. Compared to the significance level set at 5%, the P value is higher by 10.84%. Based on this, the null hypothesis is confirmed, which means that the average rating of the travel agency České kormidlo does not differ statistically significantly in individual periods, and the alternative hypothesis is rejected.

Table 3. Analysis of variance of Exim tours travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selections	12.62	2	6.312092	1.872611	0.1584195	3.075853
All selections	384.26	114	3.370743			
Total	396.89	116				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz a RecenzeCestovek.cz.

4.6. Alexandria travel agency

In the first part, a content analysis of reviews of the travel agency Alexandria was carried out. The total number of published reviews for the observed period from January 2019 to December 2023 is 37, of which 19 did not contain any verbal evaluation. Therefore, only 18 customer reviews were examined through content analysis. Most reviews were published on Mapy.sk website (21 reviews), one review was from on Mahalo.cz, and 15 reviews were found on the Google review overview. Most reviews were added to individual websites in August, September and October. Based on these reviews, three main factors were identified: courier, offer and staff. Alexandria travel agency customers most often emphasised the staff, which appeared in 5 reviews. Other numerous mentions were recorded by the factors courier (2 reviews) and offer (4 reviews), shown in Figure 16. For a better idea, these absolute numbers were converted to relative numbers, expressed in percentages. The total number of frequencies is 11. The personnel factor has the highest share, representing 45.46%. The offer has a share of 36.36% and the courier 18.18%. Of the total number of 18 reviews, 11 were negative. Most often, customers complained about accommodation in a hotel that did not correspond to the photos and described services. Other complaints related to the unavailability of the courier and problems with the return of deposits. The total negative reviews represent 61.11% of the 18 analysed reviews. The share of positive customer reviews is 38.89%.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

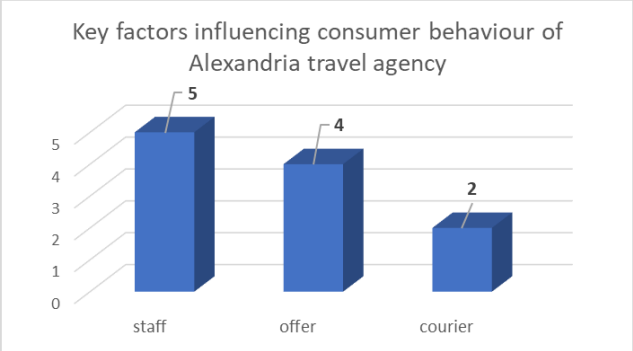


Figure 16. Key factors influencing consumer behaviour of Alexandria travel agency

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz and Google.cz

The second part focuses on the evaluation of Alexandria travel agency customers. Here is an analysis of the development of the average number of stars from the total number of 37 reviews given by customers of this agency for the period 2019-2023. In 2019, the number of reviews increased by two, and the average rating was five stars. The following year, Alexandria received six reviews with an average rating of 4.08 stars. In 2021, the average dropped by 1.33 stars to 2.75 when customers wrote four reviews. In 2022, the travel agency received 2.88 stars from 12 reviews. The highest number of reviews, 13, came in 2023, when the average number of stars was 3.18. Figure 17 shows the overall average of the Alexandria travel agency, which was 3.28 stars from Mapy.cz, Mahalo.cz and Google reviews for 2019-2023.

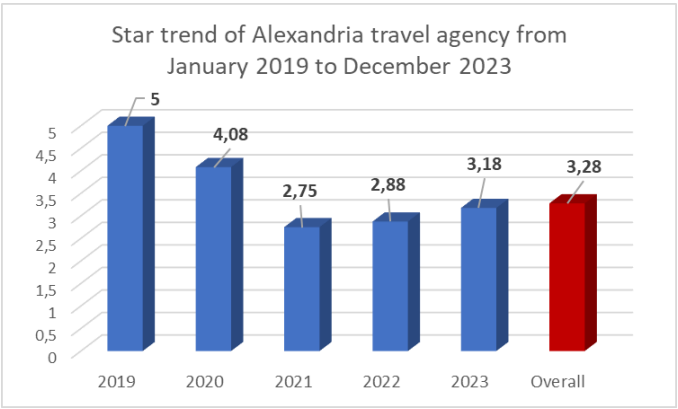


Figure 17. Star trend of Alexandria travel agency from January 2019 to December 2023

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz and Google.cz

The next part focuses on the overall average rating of the Alexandria travel agency in three time periods: before the pandemic (year 2019), during the COVID-19 pandemic (years 2020 and 2021) and now (years 2022 and 2023). 2 reviews from 2019, 10 reviews from the time of the covid-19 pandemic and currently 25 reviews from the websites Mapy.cz, Mahalo.cz and from the Google review overview are examined. Figure 18 shows that the average rating decreased in individual periods. In the period before the COVID-19 pandemic, the travel agency averaged five stars. During the COVID-19 pandemic, this average dropped by 1.45 stars to 3.55. For 2022 and 2023, i.e. currently, the average number of stars dropped to 3.03, indicating a reduction of 0.52 stars compared to the time of the COVID-19 pandemic.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

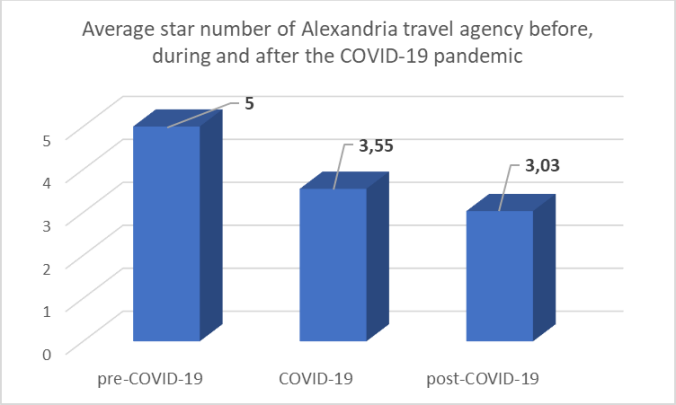


Figure 18. Average star number of Alexandria travel agency before, during and after the COVID-19 pandemic

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz and Google.cz

In addition to comparing the overall average for individual time periods, an analysis of variance (ANOVA) was performed based on the provided reviews in the MS Excel program. The null hypothesis of this test stated that the average ratings of Alexandria travel agency differ between pre-pandemic, COVID-19 and now. The alternative hypothesis, on the other hand, claimed that these ratings do not differ. The results showed that the P value was 0.3178827, 31.79%. This P value was then compared to a predetermined significance level of 5%. The P value is higher by 26.79%, which means insufficient evidence to reject the null hypothesis, indicating that the average rating of Alexandria travel agency does not differ in different periods (before the pandemic, during the COVID-19 pandemic and now), and thus the alternative hypothesis was rejected.

Table 3. Analysis of variance of Alexandria travel agency

ANOVA						
Variability source	SS	Difference	MS	F	P value	F crit
Inter-selections	8.18	2	4.091651	1.185588	0.3178827	3.275898
All selections	117.34	34	3.451159			
Total	125.52	36				

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz and Google.cz

The overall averages of the ratings of selected travel agencies over 2019-2023 are compared, including Blue Style, Fischer, Exim Tours, Čedok, České kormidlo and Alexandria. Travel agency Alexandria achieved the highest average rating, namely 3.28 stars, with the participation of 37 customers. In second place was České kormidlo with an average of 2.94 stars. The total number of reviews was 117. Blue Style occupied the third place with 2.80 stars, representing a decrease of 0.14 stars. This rating reflected 224 customer reviews. Fourth place belongs to Čedok, averaging 2.68 stars from 291 reviews for 2019-2023. Exim Tours received an average rating of 2.41 stars, indicating 0.27 stars less than Čedok, with 132 customers participating. Fischer travel agency hit the trough with an average of 2.25 stars based on 137 reviews.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

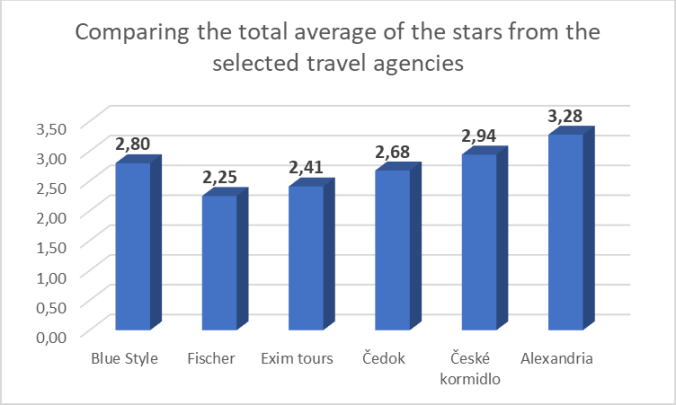


Figure 19. Comparing the total average of the stars from the selected travel agencies

Source: Author's elaboration from the following data sources Mapy.cz, Mahalo.cz, Google.cz and recenzecestovek.cz

5. Discussion

Based on the results of this work, it is possible to answer all three research questions posed at the beginning of the research. The study focused on six travel agencies: Blue Style, Fischer, Exim tours, Čedok, České kormidlo and Alexandria.

Research Question No 1: What are the key factors that lead customers to purchase from selected travel agencies?

The information was obtained from the websites Mapy.cz, Mahalo.cz, RecenzeCestovek.cz and from reviews on Google. Based on the content analysis of customer reviews, key purchase factors in individual travel agencies were identified:

- Offer: This factor implies that customers are interested in the variety and quality of available tours and services.
- Transport: Customers are concerned about the comfort and reliability of transport during travel.
- Courier: Customers value the quality of services and communication with the courier during the tour.
- Customer service: This factor suggests that customers appreciate the quality and care provided by the agency.
- Staff: This factor may include a friendly and professional approach from agency employees.

These factors vary depending on the specific travel agency:

- Blue Style: The most frequently mentioned factors are offer (73 times), transport (62 times) and courier (60 times).
- Fischer: The crucial factors are transport (35 times), courier (33 times) and offer (29 times).
- Exim tours: The most frequently mentioned factors are transport (34 times), customer service (29 times) and courier (25 times).
- Čedok: The most mentioned factors are the courier (90 times), transport (71 times) and staff (60 times).
- Czech Rudder: The decisive factors are offer (40 times), transport (27 times) and courier (24 times).
- Alexandria: The most mentioned factors are staff (5 times), offer (4 times) and courier (2 times).

A similar issue was addressed by Soifer, Choi & Lee (2021), who examined the star ratings of hotels and their ancillary services in online reviews. They found that five elements, such as free Wi-Fi, spa, pool, hotel membership, and restaurants, significantly affected users' ratings. However, the key factors for travel agents differed from the hotel sector, as elements such as swimming pool or spa are not common in travel agents, while factors such as delegates or transport are not important in hotels.

Research Question No. 2: Has customer opinion about selected travel agencies changed from January 2019 to December 2023?

The results show that travel agency ratings have changed over the years, reflecting changing customer opinions:

- Blue Style: Rating changed from 3.3 stars in 2019 to 2.71 stars in 2023.
- Fischer: Rating changed from 2.89 stars in 2019 to 2.05 stars in 2023.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r5543285992

- Exim tours: Ratings ranged from 3.90 stars in 2019 to 2.28 stars in 2023, with ratings not changing significantly.
- Čedok: Rating dropped from 2.93 stars in 2019 to 2.57 stars in 2023.
- Czech Helm: Rating changed from 3.4 stars in 2019 to 3.01 stars in 2023.
- Alexandria: Rating dropped from 5 stars in 2019 to 3.18 stars in 2023.

The online reputation of travel agencies is influenced by customer reviews, especially star ratings and verbal ratings. Positive reviews can significantly increase profits, while negative reviews lead to decreased revenue. Therefore, it is essential for travel agents to respond to reviews correctly. However, some reviews can be fake. False customer reviews may represent a limitation of this analysis, as it raises the question of whether all the reviews examined are from real customers or have been artificially created by travel agency staff. Most current methods detect these types of reviews offline, however, there are now efforts to detect fake reviews online as well. Wang & Chen (2020) proposed a novel online monitoring method that detects fraudulent product reviews and focuses on detecting fake reviews associated with reputation manipulation.

Research question No. 3: Does the average rating of the selected travel agencies differ before, during and after the pandemic?

The analysis showed that the average rating varies depending on the period for all travel agencies except Exim tours. For this office, the average rating did not change significantly in individual periods. The results are influenced by the star ratings given by customers to travel agents, especially during the COVID-19 pandemic. Similar research was conducted by Rodriguez Pallas, Montoya Reyes & Lorenzo Pérez (2023), who investigated the impact of the pandemic on travel agents in La Coruña, Spain. They used in-depth interviews with experts and an analysis of variance to compare the impact of previous health crises on travel agencies. They found that the pandemic did not force businesses to adapt to government restrictions fully, but teleworking became a key factor in keeping the business running. When compared, it can be seen that Czech travel agencies faced similar impacts from the pandemic as Spanish ones. Our results can be useful for experts in the field of reputation management, owners and managers of travel agencies, and for potential customers considering the purchase of a tour. Further research could focus on the impact of reviews on customer purchasing behaviour and methods to detect fake reviews.

Conclusions

Our study aimed to assess the reputation of six selected travel agencies in the Czech Republic based on online reviews and to identify key factors influencing this reputation, analysing Travel agencies Blue Style, Fischer, Exim Tours, Čedok, České kormidlo and Alexandria from reviews from the websites Mapy.cz, Mahalo.cz, RecenzieCestoviek.sk and Google in the period 2019-2023. Content analysis identified the key factors of the purchase decision. For example, the travel agency Blue Style focuses predominantly on the offer, transport and couriers. A similar trend regarding key factors was found in other agencies. The study also analysed changes in customer sentiment over the years 2019-2023. It turned out that opinions varied, except for Exim Tours, where customer opinions did not differ. 2020 saw an overall downgrade, reflecting the unexpected response of travel agencies to the COVID-19 pandemic. In 2021, most offices saw an improvement in their rating, which shows their ability to adapt to new market conditions. The Alexandria travel agency had the highest average rating of 3.28 stars, followed by Czech Helm with 2.94 stars and Blue Style with 2.80 stars. Finally, an analysis of variance was performed, which showed that the average rating varied among travel agencies across periods. The results indicate that reviews significantly shape the reputation of travel agencies and highlight the need for further research on the authenticity and impact of reviews on customer purchasing behaviour.

References

Anindita, K., Siswantini, S., Thanra, D., & Rajasa, F.I. (2023). Content Analysis Of Customers' Negative Reviews Of An Indonesian Online Travel Agency On The Google Play APP. *Cakrawala Repositori IMWI*, 6(4), 1341-1351. https://doi.org/10.52851/cakrawala.v6i4.398

Bartoš, V., Vochozka, M., & Šanderová, V. (2022). Copper and Aluminium as Economically Imperfect Substitutes, Production and Price Development. *Acta Montanistica Slovaca*, 27(2), 462-478. https://doi.org/10.46544/AMS.v27i2.14

da Silva, D.L.B., da Silva, J.R., Ferreira, L.B., & Sousa, E.D.N. (2021). Customer Communication via Social Networks: from acquisition to post-sales strategies by travel agencies in São Luís do Maranhão, Brazil. *Turismo, Visão e Ação*, 23(1), 216-241. https://doi.org/10.14210/rtva.v23n1.p216-241

Dorčák, P., Markovič, P., & Pollák, F. (2017). Multifactor Analysis of Online Reputation as a Tool for Enhancing Competitiveness of Subjects from Automotive Industry. *Ekonomický časopis/Journal of Economics*, 65(2), 173-186.

Dorčák, P., Štrach, P., & Pollák, F. (2015). Analytical view of the perception of selected innovative approaches in marketing communications. *Quality Innovation Prosperity*, 19(1), 74-84. https://doi.org/10.12776/qip.v19i1.441

Dudek, A., Jaremen, D.E., & Michalska-Dudek, I. (2023). Factors Determining ROPO Behaviors of Travel Agencies Customers during the COVID-19 Pandemic. *Sustainability*, 15(7), 6142. https://doi.org/10.3390/su15076142

Efthymiou, L., & Orphanidou, Y. (2022). Customer Feedback. In B. Dimitrios (Ed.), Encyclopedia of Tourism Management and Marketing (pp. 729–731). Cheltenham (UK): Edward Elgar Publishing Limited. https://doi.org/10.4337/9781800377486

Fardeen, N., Ansari, M., Hanzala, S., Nadim, S., & Shaikh, A. (2023). Customer Review Analysis and Identifying Spam Reviews. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)*, 3(2), 710-716. https://doi.org/10.48175/IJARSCT-8908

Ganatra, V., Gde Satia Utama, A.A., Pawar, P., Verma, S., Pandey, R., Whiryawan, J., Sin, L.G., Ling, C.C., Kee, D.M.H., Jin, C.Y., Min, T.H., & Chen, L.S. (2021). Marketing Strategies of Travel and Tourism Industry. *International Journal of Tourism and Hospitality in Asia Pasific*, 4(1), 43-52. https://doi.org/10.32535/ijthap.v4i1.1020

Gavurova, B., Ivankova, V., Rigelsky, M., & Přívarová, M. (2020). Relations between tourism spending and global competitiveness–an empirical study in developed OECD countries. *Journal of Tourism and Services*, 11(21), 38-54. https://doi.org/10.29036/jots.v11i21.175

Gavurova, B., Belas, J., Valášková, K., Rigelský, M., & Ivankova, V. (2021). Relations between infrastructure innovations and tourism spending in developed countries: A macroeconomic perspective. *Technological and Economic Development of Economy*, 21(5), 1072-1094. https://doi.org/10.3846/tede.2021.15361

Gavurova, B., Rigelský, M., & Mikeska, M. (2023). Relationships between road transport indicators and expenditure of visitors in the context of European countries' tourism competitiveness. Equilibrium. *Quarterly Journal of Economics and Economic Policy*, 18(2), 393-418. https://doi.org/10.24136/eq.2023.012

Gurov, S.A. (2022). Feedback as a tool to manage change in hotel service on the example of a five-star hotel. *Гостиничное дело*, 9, 581-588. https://doi.org/10.33920/igt-2-2209-04

Hamdan, M., Canós-Darós, L., & Guijarro, E. (2022). The impact of customer reviews in social media on the brand reputation for the online accommodation sector. In F.J. Garrigós-Simón, S.E. Miguel, J.O.M. Andrés & Y. Narangajavana (Ed.), INNODOCT/22. International Conference on Innovation, Documentation and Education. Valencia, November 2nd-7th 2022 (pp. 93–100). València (Spain): Editorial Universitat Politècnica de València. https://doi.org/10.4995/INN2022.2022.15785

Chen, J.-S., Kamalanon, P., & Janupiboon, T.P. (2022). Company websites and mobile apps versus social media: which service experience creates more customer value for online travel agencies? *Service Business*, 16 (4), 1081-1110. https://doi.org/10.1007/s11628-022-00511-x

Isya', A.D.K., Suratno, B., & Azzam, A. (2023). Analysis of Travel Agent Online Marketing Strategies on Social Media Content Using Sentiment Analysis and Social Network Analysis. *Journal of Information Systems and Informatics*, 5(4), 1764-1778. https://doi.org/10.51519/journalisi.v5i4.630

Kamble, Z., Doan, Q. T., Nguyen, H. N., Zeng, Z., & Liao Zihui, L. (2020). The Significance of Online Reviews for Hotel Entrepreneurial Success. In A. Masouras, G. Maris, & A. Kavoura (Eds.), *Entrepreneurial Development and Innovation in Family Businesses and SMEs* (pp. 75-86). IGI Global. https://doi.org/10.4018/978-1-7998-3648-3.ch005

Kim, H.L., & Hyun, S.S. (2024). Impact of travelers' consumer ethnocentrism on purchase and behavior intention: moderating effect of implicit prejudice. *International Journal of Tourism Research*, 26(1), e2607. https://doi.org/10.1002/jtr.2607

Krupenna, I., & Kokhan, M. (2022). Consumer behavior in tourism: features of the model and methods of study. *Economic Bulletin of Cherkasy State Technological University*, 66, 69-78. https://doi.org/10.24025/2306-4420.66.2022.268565

Li, H., Li, W., Zhao, J., Yu, P., & Huang, Y. (2023). A sentiment analysis approach for travel-related Chinese online review content. *PeerJ Computer Science*, 9, e1538. https://doi.org/10.7717/peerj-cs.1538

Markovič, P., Pollák, F., Vavrek, R., & Kostiuk, Y. (2022). Impact of Coronavirus Pandemic on Changes in e-Consumer Behaviour: Empirical Analysis of Slovak e-Commerce Market. *Ekonomický časopis/Journal of Economics*, 70(4), 368-389. https://doi.org/10.31577/ekoncas.2022.04.04

Mazurek-Kusiak, A. (2022). Model of Tourist Service Purchasing Decisions in Travel Agencies. *Folia Turistica*, 58, 9-33. https://doi.org/10.5604/01.3001.0016.0328

Pollák F., Markovič P., Vavrek R., & Konečný M. (2022). Return to the New Normal: Empirical Analysis of Changes in E-Consumer Behavior during the COVID-19 Pandemic. *Behavioral Sciences*, 12(3), 85. https://doi.org/10.3390/bs12030085

Pollák, F., Vavrek, R., Váchal, J., Markovič, P., & Konečný, M. (2021). Analysis of Digital Customer Communities in terms of their interactions during the first wave of the COVID-19 pandemic. *Management & Marketing*, 16(2), 134-151. https://doi.org/10.2478/mmcks-2021-0009

Ramnarayan, Joshi, K., Reshi, J., Memoria, M., Gupta, A., & Rastogi, N. (2022). AI/ML Based new smart customer feedback system for hospitality Industry. In *2022 7th International Conference on Computing, Communication and Security (ICCCS 2022), Seoul, South Korea, 3-5 November 2022* (pp. 1–4). IEEE. https://doi.org/10.1109/ICCCS55188.2022.10079480

Rezvani, E., & Rojas, C. (2022). Firm responsiveness to consumers' reviews: The effect on online reputation. *Journal of Economics & Management Strategy*, 31(4), 898-922. https://doi.org/10.1111/jems.12484

Roberts-Lombard, M., & Steyn, D. (2022). The referral-marketing practices of travel agencies: an exploratory study of word-of-mouth communication in the travel-agency industry in the Western Cape. *Communicare: Journal for Communication Studies in Africa*, 29 (1), 21-39. https://doi.org/10.36615/jcsa.v29i1.1674

Rodriguez Pallas, A., Montoya Reyes, A., & Lorenzo Pérez, C. (2023). COVID-19's effect on Spanish retail travel agency management. The case of A Coruña. *Revista interamericana de ambiente y turismo*, 19(2), 100-111. http://dx.doi.org/10.4067/S0718-235X2023000200100

Ruschak, M., Caha, Z., Talíř, M., & Konečný, M. (2023). The application of CSR in marketing communication and its potential impact on customer perceived value. *Entrepreneurship and Sustainability Issues*, 10(4), 223-244. https://doi.org/10.9770/jesi.2023.10.4(14)

Sharma, A., Sharma, P., Manalo, J.V.I., & Anh, D.N. (2023). Customers online Reviews and Its impact on Purchase Intention in Hospitality Industry: A Quantitative Investigation. *Journal of Informatics Education and Research*, 3(1), https://doi.org/10.52783/jier.v3i1.62

Skare, M., Gavurova, B., & Polishchuk, V. (2023). A large-scale decision-making model for the expediency of funding the development of tourism infrastructure in regions. *Expert Systems*, e13443. https://doi.org/10.1111/exsy.13443

Soifer, I., Choi, E.K., & Lee, E. (2021). Do Hotel Attributes and Amenities Affect Online User Ratings Differently across Hotel Star Ratings? *Journal of Quality Assurance in Hospitality & Tourism*, 22 (5), 539-560. https://doi.org/10.1080/1528008X.2020.1814935

Straková, J., Korauš, A., Váchal, J., Pollák, F., Černák, F., Talíř, M., & Kollmann, J. (2021). Sustainable Development Economics of Enterprises in the Services Sector Based on Effective Management of Value Streams. *Sustainability*, 13 (16), 8978. https://doi.org/10.3390/su13168978

Straková J., & Kostiuk Y. (2023). Importance of Business Process Quality for Creating Added Value and Raising Reputation of Companies in Low-Carbon Economy. *Energies*, 16 (17), 6388. https://doi.org/10.3390/en16176388

Straková, J., Talíř, M., & Váchal, J. (2022). Opportunities and threats of digital transformation of business models in SMEs. *Economics & Sociology*, 15, 159-171. https://doi.org/10.14254/2071-789x.2022/15-3/9

Vasquez, J.G., Cantimbuhan, N., Po, W.A.R., & Deogracias, E. (2023). Travel agencies' webportal perception based on customer review in hotel luna, vigan city. *Quantum Journal of Social Sciences and Humanities*, 4 (1), 11-23. https://doi.org/10.55197/qjssh.v4i1.178

Vochozka, M., Kalinová, E., Gao, P., & Smolíková, L. (2021). Development of copper price from July 1959 and predicted development till the end of year 2022. *Acta Montanistica Slovaca*, 26(2), 262-280. https://doi.org/10.46544/AMS.v26i2.07

Vochozka, M., Horák, J., Krulický, T., & Pardal, P. (2020). Predicting future Brent oil price on global markets. *Acta Montanistica Slovaca*, 25(3), 375-392. https://doi.org/10.46544/AMS.v25i3.10

Vochozka, M., Neuschlová, L., & Janíková, J. (2023). Evaluation and prediction of polyolefin price development. *Acta Monstanistica Slovaca*, 28 (3), 733-751. https://doi.org/10.46544/AMS.v28i3.17

Vochozka, M., Novotná, A., & Borovková, B. (2022). Driving Forces Behind Gas Price in Global Markets. *Acta Montanistica Slovaca*, 28 (1), 141-156. https://doi.org/10.46544/AMS.v28i1.12

Wang, Z., & Chen, Q. (2020). Monitoring online reviews for reputation fraud campaigns. *Knowledge-Based Systems*, 195. https://doi.org/10.1016/j.knosys.2020.105685

Funding: This article is one of the partial outputs of the currently solved research project IVSUPS2305. This research was funded by the Institute of Technology and Business in České Budějovice, grant number IVSUPS2305.

Author Contributions: Conceptualisation: *Konečný*; methodology: *Kutová*; data analysis: *Kutová*; writing—original draft preparation: *Kutová*; writing, review and editing: *Konečný*; visualisation: *Dušek, Chamrada*. All authors have read and agreed to the published version of the manuscript.

Michal KONEČNÝ is an Assistant Professor at the Institute of Technology and Business, Faculty of Corporate Strategy. As a member of the Department of Tourism and Marketing, he teaches courses related to Marketing, Business Information Systems, CRM systems and Business Activities. In 2023, he successfully defended his dissertation thesis and received his PhD. degree at the University of Economics in Bratislava, Faculty of Business Management, where he specialised in economics and management. He is engaged in research, project and publication activities. Main research interests: His current research includes corporate reputation in the context of sustainable development.
ORCID ID: https://orcid.org/0000-0001-7926-257X

Kateřina KUTOVÁ is a junior researcher at the Institute of Technology and Business in České Budějovice. In 2024, she completed her bachelor's studies in Business Economics at the Institute of Technology and Business in České Budějovice, where she successfully defended her bachelor's thesis and received her Bc. degree. She is currently continuing her master's studies in Business Economics at the Institute of Technology and Business in České Budějovice specialising in Business Economy - Product and value management. Main research interests: She focuses on issues related to corporate reputation in the context of sustainable development.
ORCID ID: https://orcid.org/0009-0009-0029-6634

Radim DUŠEK is an Assistant Professor at the Institute of Technology and Business, Faculty of Corporate Strategy. As a Deputy Head of Department and a member of the Department of Tourism and Marketing, he teaches courses related to marketing, marketing communication, marketing management, public relations, and advertising and media practices. He is engaged in research, project and publication activities. Main research interests: His current research includes the latest global trends in digital marketing communication.
ORCID ID: https://orcid.org/0000-0003-1381-0064

Daniel CHAMRADA is an Assistant at the Institute of Technology and Business, Faculty of Corporate Strategy. As a member of the Department of Management, he teaches courses related to project management and crisis management. He is currently continuing his PhD studies at the University of Žilina, The Faculty of Operation and Economics of Transport and Communications. He is engaged in research, project and publication activities. Main research interests: His current research includes theory of constraints.
ORCID ID: https://orcid.org/0000-0002-3934-7840

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

Publisher
http://jssidoi.org/esc/home

RESEARCH ON EMPLOYEE SUCCESS, PERFORMANCE, AND SATISFACTION IN THE BULGARIAN IT INDUSTRY*

Ivan Dimitrov [1], Yoana Krumova [2], Adile Dimitrova [3]

[1,2,3] Prof. Dr Asen Zlatarov University-Burgas, 1 Prof. Yakimov str, 8010 Burgas, Bulgaria

E-mails: [1]i.t.dimitrov@abv.bg; [2]yoana.krumova@mail.com; [3]adiledimitrova@abv.bg

Received 31 October 2024; accepted 10 December 2024; published 30 December 2024

Abstract. In the heart of Bulgaria's booming IT industry, a hidden blueprint for success is emerging. Sustaining competitive advantage requires a nuanced understanding of the factors that drive employee performance, satisfaction, and retention. This study investigates how different elements of the job requirements influence workforce dynamics among IT professionals in both technical and managerial roles. Through a comprehensive quantitative survey, this research examines the impacts on achievements, performance, and role fulfilment, revealing that Bulgarian IT employees prioritise balanced workdays, defined advancement pathways, and compensations that respect their talent. Matching quality standards with a solid people-centred focus optimise productivity, while career development opportunities partially offset the need for higher compensation, enhancing overall satisfaction. The findings offer actionable recommendations for human resource strategies uniquely suited to Bulgaria's IT sector. To foster a thriving workforce, IT firms are advised to invest in initiatives supporting work-life balance, structured career development, and employee recognition, strengthening engagement and satisfaction. By addressing the distinct needs of Bulgaria's IT professionals, this research enriches the discourse on human resource management in technology sectors, proposing a framework that empowers organisations to cultivate a resilient, motivated workforce. This approach ensures that Bulgaria's IT industry remains well-positioned to thrive within the fast-evolving, high-demand global market, ultimately contributing to sustainable sectoral growth and innovation.

Keywords: employee success; employee performance; job satisfaction, Bulgarian IT industry; workforce retention; career development; employee engagement; work-life balance; compensation satisfaction; talent management

Reference to this paper should be made as follows: Dimitrov, I., Krumova, Y., Dimitrova, A. 2024. Research on employee success, performance, and satisfaction in the Bulgarian IT industry. *Entrepreneurship and Sustainability Issues*, 12(2), 295-313. http://doi.org/10.9770/j8746832232

JEL Classifications: M12, M50, J23, J24

1. Introduction

As a rapidly evolving and high-growth sector, Bulgaria's IT industry has become an essential contributor to the national economy, drawing on a rich legacy of technical expertise and innovation (Stefanov, Boeckholt, & Pontikakis, 2021) (Duque, Collins, Abbate, Azambuja, & Snaprud, 2007) (Đorđević, 2021). The industry's success is primarily attributed to a technically proficient, multilingual workforce concentrated in key cities, including Sofia, Plovdiv, Varna, and Burgas (NCube, 2022). This workforce, comprising over 70,000 skilled professionals, serves a diverse range of international clients, primarily in Europe and the US, with more than 80% of the sector's revenue generated through exports (International Trade Administration, 2024).

* *This research was funded by Prof. Dr. Asen Zlatarov University – Burgas, Bulgaria, Project NIH 485/2023*

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

Bulgaria also ranks among the top in Europe for software development quality, highlighting its professionals' technical rigour and problem-solving capabilities (Trikha, 2016). This industry has shown resilience and adaptability, achieving a 10% revenue increase even during the economic challenges of the COVID-19 pandemic, while the national GDP declined by 5.5% (BASSCOM, 2023). However, as the IT industry expands, it faces critical challenges in retaining top talent and meeting employee expectations for career development, work-life balance, and job satisfaction. Addressing these complications in workforce retention and skill development will be essential for the Bulgarian IT sector to sustain its competitive advantage.

This study explores the factors influencing employee success, performance, and satisfaction in the Bulgarian IT sector, where these dynamics are particularly pertinent due to the industry's high demand and competitive job market. Through a quantitative survey targeting IT professionals across various technical and managerial roles, this research examines trends, experiences, and skill levels to gain insights into workforce dynamics. Main constructs are analysed to understand their impact on employee outcomes, including productivity, job satisfaction, and role fulfilment.

By investigating these relationships, this study seeks to offer actionable insights into employee engagement and retention strategies that align with the unique needs of the Bulgarian IT industry. The findings will contribute to the broader knowledge base on talent management in tech, guiding IT firms in Bulgaria to develop targeted interventions that foster a sustainable, competitive workforce.

2. Theoretical background

Employee success, performance, and satisfaction are interconnected aspects of workforce dynamics that are critical to organisational productivity and employee retention (Prentice, 2022; Pepple & Ambilichu, 2024). Success, as a concept in the workplace, is multi-dimensional, encompassing personal achievements, career advancement, and fulfilment of professional objectives. It integrates cognitive abilities, personality traits, educational background, and social competencies—all factors highly valued by companies and that enhance individual employability and career growth (Hogan, Chamorro-Premuzic, & Kaiser, 2013). Early career success is typically grounded in support systems, resilience, and work-life balance, while long-term success benefits from continuous learning, goal-setting, and the acquisition of business and leadership skills (Bell, Cake, & Mansfield, 2019). Research has shown that employee conscientiousness, extraversion, and age are strong predictors of perceived job success. This achievement is often associated with higher personal accomplishment, lower levels of emotional exhaustion, and more stable, responsibility-driven roles (Rubio-Valdehita, Díaz-Ramiro, & López-Núñez, 2023). Happiness, rather than merely resulting from workplace success, serves as a catalyst, encouraging greater engagement and productivity (Boehm & Lyubomirsky, 2008; Raza & Yousufi, 2023; Hemsworth et al., 2024; Shah et al., 2024).

In industries like Bulgaria’s IT sector, where talent is a core driver of success, a deep understanding of these factors is essential for companies aiming to attract and retain top employees.

Employee performance, particularly in the IT sector, is complex, requiring technical and soft skills. Defined as the quality and quantity of work delivered by employees (Pradhan & Jena, 2017), performance encompasses productivity, quality of work, and goal achievement. Effective performance relies on goal alignment, where employees have clear targets and are aware of how to direct their efforts toward them (Lawler & Porter, 1967). Managing employee performance requires setting goals, providing feedback, and evaluating progress (Osmani & Maliqi, 2012). Employee performance can be measured through various indicators—productivity, work quality, customer satisfaction, and behavioural traits like creativity, problem-solving, teamwork, communication, and self-management (Murphy & Cleveland, 1995). Self-management skills, in particular, are essential for IT professionals who often work in autonomous or flexible environments. Campbell also emphasises that performance is an individual-level variable or something a single person does (Campbell, 1990).

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

This skill enables employees to set priorities, manage time effectively, and maintain focus in a high-demand workplace.

Employee satisfaction is closely linked to both success and performance. Employee satisfaction captures employees' overall perceptions and attitudes toward their job roles, workplace environment, and the organisation. It involves the degree to which employees feel that their needs and expectations are met in the workplace, encompassing elements such as job fulfilment, engagement, and the level of support and direction provided by leadership (Saari & Judge, 2004). Satisfaction is often influenced by critical factors like compensation, work-life balance, opportunities for advancement, and the company's culture, which shape employees' willingness to invest in their roles and remain committed to the organisation (Melián-González, Bulchand-Gidumal, & López-Valcárcel, 2015; Shafagatova et al., 2023). Satisfied employees are more likely to deliver high-quality service, which improves customer satisfaction, supports employee retention, and contributes to the long-term profitability and efficiency of the business (Fang, Gao, & Hu, 2021).

The relationship between these three constructs—employee success, performance, and satisfaction—forms a complex web that businesses must navigate to foster a thriving workforce. This research explores these interconnections within the Bulgarian IT sector, providing insights that can inform best practices in recruitment, retention, and employee development. By addressing the unique challenges and opportunities present in this rapidly evolving industry, the study seeks to contribute to the body of knowledge on human resource management and organisational behaviour in Bulgaria.

3. Research objectives and methodology

This study uses a quantitative approach, utilising an online survey to capture demographic, technical, and experiential data from IT professionals. The target population consists of technical professionals employed in the Bulgarian IT industry. This includes a range of technical and managerial roles, such as software development, DevOps, cybersecurity, project management, and IT support. The sampling is meant to capture a diverse cross-section of the Bulgarian IT workforce, recognising the industry's various skills, responsibilities, and career stages. Specifically, the research aims to:

- ✓ Examine demographic trends across various technical roles and career stages to reveal patterns that may impact employee advancement.
- ✓ Explore the distribution and self-assessment of technical skills across different job functions to determine how perceived expertise varies with role type and seniority.
- ✓ Analyse workplace experience constructs—work-life integration, employee reward systems, collaboration practices, etc.—and assess their impact on job satisfaction and productivity.
- ✓ Investigate the relationship between specific predictors (self-management, career development resources, compensation satisfaction) and their combined effects on employee success and role fulfilment.
- ✓ Explore the moderating role of interaction effects between factors like user satisfaction and quality emphasis to provide insights into how IT professionals balance technical rigour with user-centred outcomes.

With these objectives, the study intends to elucidate critical aspects of workforce dynamics in the Bulgarian IT sector, inform potential interventions for enhancing employee experience, and contribute to the broader discourse on diversity and work-life balance in the technology industry.

A convenience sampling approach was used, primarily reaching participants through LinkedIn and Bulgarian IT industry networks. Invitations to participate in the study were distributed to individuals and groups within these platforms, focusing on technical employees across various firms. The survey questions were adapted from established scales used in prior research on employee satisfaction, performance, and workplace experience constructs, ensuring consistency with validated frameworks. The survey includes six main sections:

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

1) Demographic information: This section collects respondents' gender, age, educational background, type of employer, job title, and years of experience to profile the workforce and allow for comparative analysis across different groups.
2) Insights on the selection stages: Participants were asked about the duration, transparency, and perceived fairness of the hiring journey, including the types of assessments used and their perceived relevance. These responses help identify factors within the candidate's experience that may later influence job satisfaction and alignment with role expectations.
3) Workplace experience and onboarding: Questions in this section explore the onboarding resources provided, including formal training, mentorship, and on-the-job learning. Participants also rated the importance of a balanced lifestyle approach, flexibility, and cultural fit, as well as the efficacy of workplace support resources such as feedback and coaching.
4) Skills, performance, and collaboration: The survey included questions assessing self-rated technical skills, collaboration abilities, time and self-management, etc. This section also addressed employees' challenges, such as adapting to new technologies, balancing workloads, and managing work stress.
5) Employee satisfaction and motivation: Respondents evaluated their satisfaction with compensation, benefits, recognition, career development opportunities, and the supportiveness of the work environment. Motivation was also measured to understand employees' engagement and drive toward achieving personal and corporate objectives.
6) Career goals and feedback systems: This section covers goal-setting practices, methods of tracking success, and feedback-seeking habits. Additional questions assessed the extent to which respondents felt prepared and equipped for career advancement, reflecting on organisational support and personal development.

Through this methodology, the research aims to generate a comprehensive dataset that enables a robust examination of factors influencing engineers' career experiences in Bulgaria. Data analysis was performed using a combination of descriptive and inferential statistical techniques:

- Descriptive statistics: Summary statistics (e.g., means, standard deviations, and frequencies) were computed for key variables such as demographic information, self-rated technical and soft skills, satisfaction with hiring and onboarding processes, and workplace support. This provided an overview of the distribution of responses and highlighted patterns within the dataset.
- Chi-square tests: Chi-square analyses were conducted to examine associations between categorical variables, particularly demographics and other factors. This helped identify any significant patterns or disparities within various subgroups.
- Factor analysis: Principal component analysis with Varimax rotation was used to reduce and organise responses from sections covering workplace experience, skill development, and employee satisfaction. Factor analysis was conducted on responses related to job satisfaction, onboarding, feedback systems, and challenges faced in work-life balance. Loadings and reliability coefficients (Cronbach's alpha) were calculated to validate the factors and ensure internal consistency.
- Correlation analysis: Bivariate correlations were calculated to explore relationships between key variables such as compensation satisfaction, work-life balance, collaboration, and job satisfaction. These correlations provided insights into how specific skills and workplace resources are related to employee fulfilment, motivation, and success.
- Regression analysis: Multiple regression models were employed to identify predictors of productivity and role satisfaction, using independent variables such as the perceived effectiveness of feedback, career development resources, and onboarding processes. Specific focus was given to assessing how skills in self-management, technical expertise, and communication predict overall productivity and job fulfilment. Satisfaction with compensation and benefits, feedback mechanisms, and career advancement opportunities was also analysed to determine their impact on employee motivation.
- Moderation analysis: Interaction terms were created for selected variables to assess potential moderation effects. Mean-centring was applied to reduce multicollinearity, and interaction terms were tested in separate regression models to determine whether specific predictors moderated relationships with productivity and satisfaction.

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

The reliability of the constructs was assessed using Cronbach's alpha, with coefficients above 0.75 indicating good internal consistency. Sampling adequacy for factor analysis was confirmed using the Kaiser-Meyer-Olkin (KMO) measure, and Bartlett's sphericity test verified the data's appropriateness for factor analysis. Although the study's cross-sectional design and reliance on self-reported data may present limitations, including multiple items per construct mitigates these concerns. This yields a robust and credible analysis of factors influencing employee outcomes in the Bulgarian IT sector. By combining demographic profiling, technical skills assessment, and workplace experience analysis, this methodology allows for a comprehensive examination of the elements influencing employee success, performance and satisfaction in the Bulgarian IT industry.

4. Results

4.1. Demographic profile and technical skills distribution

A detailed analysis of the demographic profiles of respondents shows notable patterns in gender distribution, with 76.7% of respondents identifying as male and 23.3% as female. Although overall participation rates across roles such as backend, frontend, and full-stack development appear relatively balanced, Chi-square test results reveal significant gender disparities in several specialised technical roles (**Figure 1**). These disparities are particularly evident in fields like mobile development (χ^2=9.96, df=1, $p < 0.01$), cloud computing (χ^2=7.16, df=1, $p < 0.01$), DevOps/Security (χ^2=19.34, df=1, $p < 0.001$), and web development (χ^2=5.01, df=1, $p < 0.05$). Such roles exhibit a higher male representation, highlighting a potential area for targeted diversity initiatives to promote female participation in highly specialised technical domains.

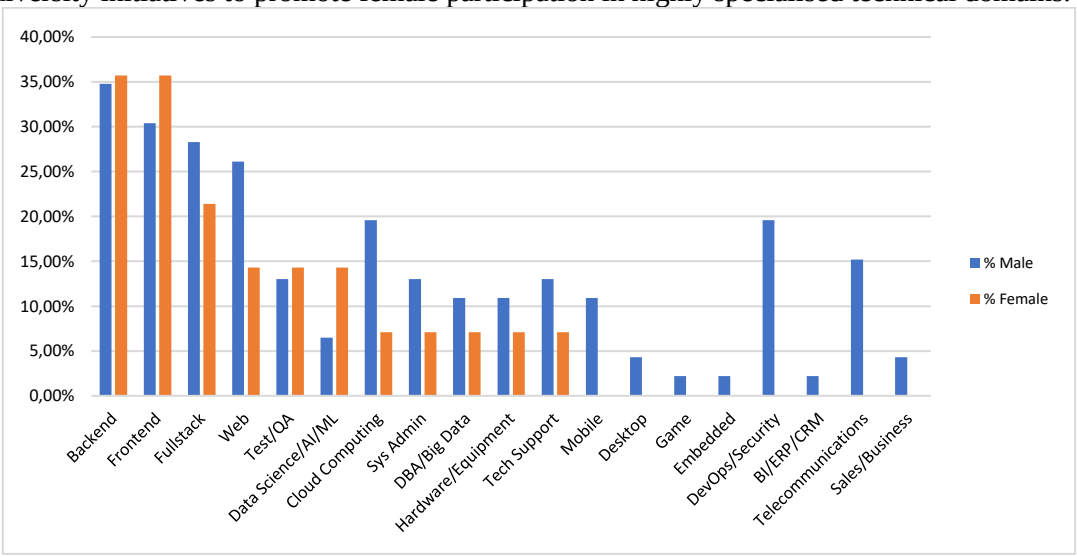


Figure 1. Gender distribution across various technical functions, visually emphasising the male-dominated nature of certain specialities

Furthermore, gender-based disparities appear to widen with increased seniority. Males are more frequently represented in senior technical roles, particularly those requiring more than five years of experience, while females are predominantly found in the early stages of their careers. This trend suggests the presence of potential barriers to advancement for women within the Bulgarian IT industry, potentially indicative of a glass ceiling effect that merits further investigation.

The educational background of participants also reflects high qualifications, with 41.7% holding a master's degree or equivalent and 38.3% a bachelor's degree, underscoring the advanced educational standards among Bulgarian IT professionals (AIBEST, 2020). However, it is notable that females are less commonly found with

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

advanced postgraduate qualifications. Higher educational attainment is correlated with more senior roles, especially in leadership positions, where respondents also rate their technical expertise at the highest levels.

Self-assessed technical expertise ratings vary significantly across roles. Multi-functional roles, such as full-stack development, show higher average self-assessment scores in technical expertise (between 4.5 and 5.0 on a 5-point scale), compared to more specialised functions, such as backend development, which averages around 3.3. This finding suggests that professionals in roles with broader scopes perceive themselves as more versatile and competent across a range of technical skills. Leadership roles also show high self-assessed expertise levels, with average ratings reaching 5.0. This reflects a concentration of perceived expertise among more senior professionals, likely attributed to extensive experience and a broader scope of responsibility.

Despite the underrepresentation of females in senior roles, women are well-represented in entry-level and early-career positions. This distribution raises an important area for further research: the potential challenges women encounter when advancing to senior technical or leadership roles. Examining factors such as structural barriers, workplace culture, and recruitment biases could shed light on whether these factors contribute to the observed disparities.

4.2. Factor structure and reliability of employee experience constructs

The factor model explained a cumulative variance of 61.9% across the first 11 factors, indicating a complex structure underlying employee experiences. Notably, Factor 1 alone accounted for 14.1% of the total variance, suggesting that a select group of variables captures a substantial proportion of the variation in employee responses. Each subsequent factor contributed incrementally, providing more nuanced insights into different dimensions of employee success and satisfaction. The rotated component matrix further clarified this structure, delineating variables into distinct factors, each representing a unique latent construct. Below is a summary of the 4 most prominent factors:

Factor 1: Assessment effectiveness and job role fit is characterised by high loadings on variables such as the usefulness of technical tests, situational cases, and work samples, reflecting the perceived effectiveness of these assessments in evaluating job fit. This suggests that rigorous testing processes are seen as critical predictors of job compatibility.

The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.83, indicating that the data is well-suited for factor analysis. Bartlett's test of sphericity was significant ($\chi^2 = 990.52$, df = 21, $p < 0.001$), confirming intercorrelations among the variables. With a Cronbach's alpha of 0.85, this factor demonstrates strong internal consistency, suggesting reliability in measuring the underlying construct. Notably, none of the items improved reliability significantly if removed, as confirmed by corrected item-total correlations and alpha values, indicating that each item contributes meaningfully to the factor.

Table 1. Key variables and loadings for factor 1: Assessment effectiveness and job role fit

Top Variables	Loading
Usefulness of Practical Assignments	1.81
Value of Work Sample Evaluations	1.63
Relevance of Cognitive Tests	1.52
Effectiveness of Group Discussions	1.25
Utility of Technical Tests	1.24
Value of Situational Cases	1.06
Usefulness of Reference Checks	1.03

Factor 2: Work-life challenges and support systems represents the interplay between personal challenges and the potential mitigating effect of support systems within the workplace. It encapsulates the difficulties employees face in managing professional and personal commitments, stress, skill demands, and time constraints

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

while also highlighting the beneficial role of support mechanisms. High loadings on stress and conflicts between professional and personal priorities indicate that employees in the Bulgarian IT industry are under considerable strain, and without adequate support, these challenges could lead to reduced engagement and performance.

A KMO of 0.78, deemed acceptable, and Bartlett's test of sphericity was significant (χ^2=2021.54, df = 45, p < 0.001), confirming the suitability of the data for factor analysis.

Table 2. Key variables and loadings for factor 2: Work-life challenges and support systems

Top Variables	Loading
Frequency of Overtime Work	0.86
Difficulty Adapting to Workplace Changes	0.56
Challenges in Work-Life Balance	1.05
Issues with Managing Work Stress	1.15
Difficulty Learning New Skills	0.62
Struggles with Technical Issues	0.67
Challenges in Time Management	0.69
Usefulness of WLB recourses // *removed for reliability*	-0.51
Effectiveness of Group Discussions // *removed for reliability*	0.51
Work & Personal Life Balance // *removed for reliability*	-1.01

After removing misaligned items, a reliability analysis revealed a Cronbach's alpha of 0.85, suggesting good internal consistency among the remaining items. This reliability score indicates that the items within this factor coherently measure the underlying construct of work-life challenges and support systems. The factor suggests that enhancing support systems and promoting healthy work-life blend may help alleviate some of these challenges, enabling employees to perform better and experience greater success in their roles.

Factor 3: Employee rewards and satisfaction capture the key elements of the workplace that contribute directly to employee satisfaction and a sense of support. High loadings on these variables suggest that employees value both tangible rewards (like fair compensation and growth opportunities) and intangible benefits (like recognition and constructive feedback). The KMO was 0.79 and Bartlett's test of sphericity was significant (χ^2=1406.78, df = 28, p < 0.001), verifying that this data set is appropriate for factor analysis. The reliability analysis yielded a Cronbach's alpha of 0.86, suggesting that the items within this factor are cohesively measuring the construct of employee rewards and satisfaction.

Table 3. Key variables and loadings for factor 3: Employee rewards and satisfaction

Top Variables	Loading
Value of Career Advancement Opportunities	0.81
Frequency of Employee Recognition	0.63
Usefulness of Constructive Feedback	0.62
Perceived Fairness of Compensation & Benefits	1.00
Comfort in Work Environment	0.62
Satisfaction with Compensation	0.72
Importance of Work-Life Balance Support	0.53
Supportiveness of Organisational Culture	0.55

The factor underscores that satisfaction in the Bulgarian IT industry is closely linked to compensation, advancement opportunities, and recognition. While work-life balance and supportive culture are valued, tangible success is also important. The insights suggest employers can enhance employee satisfaction by focusing on fair compensation, clear career advancement paths, and a positive recognition culture. This approach can help retain talent and foster a supportive and satisfied workforce.

Factor 4: Collaboration and advancement skills emphasise the dual importance of effective communication and career-focused skills in the workplace (KMO=0.77, χ^2=916.05, df = 15, p < 0.001). High loadings on

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

variables related to communication abilities—such as writing, speaking, presenting, and negotiating—underscore the value of these skills for career advancement. Mastery in these areas enables employees to navigate the workplace more effectively, take on leadership roles, and interact confidently with clients, colleagues, and stakeholders.

The factor achieved a Cronbach's alpha of 0.81, which indicates good internal consistency. Although removing the importance of career advancement would increase Cronbach's alpha to 0.85, this item was kept given the central relevance of career advancement to employee satisfaction and professional development in the Bulgarian IT industry. Thus, it was retained to provide a more comprehensive representation of the skills necessary for collaboration and career advancement.

Table 4. Key variables and loadings for factor 4: Collaboration and advancement skills

Top Variables	Loading
Importance of Career Advancement	0.78
Writing Collaboration	0.85
Verbal Communication	0.71
Negotiation Skills	0.78
Active Listening Skills	0.72
Presentation Skills	0.88

This factor suggests that employees in the Bulgarian IT industry regard communication skills as fundamental for career growth. Employers can support this by offering communication training programs, public speaking workshops, and career development resources. By fostering these skills, companies can enable employees to achieve their career goals while enhancing team collaboration and overall organisational communication effectiveness.

4.3. Correlation insights: Relationships between satisfaction, skills, and workplace support

Data for this analysis were derived from questions assessing satisfaction, confidence, and perceived usefulness of various workplace elements among IT employees in Bulgaria. Using correlation analysis, significant relationships were examined (with $r > 0.3$), reflecting relationships that may influence employee satisfaction, performance, and work-life balance.

4.3.1. Task-specific relationships

Employees who find compensation and benefits resources useful report higher satisfaction with new solution implementations ($r=0.359$). This suggests that a well-structured benefits program positively impacts adaptability and receptiveness to innovation. These correlations align with factor 3, highlighting that satisfaction with compensation is integral to overall job satisfaction and adaptability. Similarly, employees confident in their time management skills tend to be more satisfied with troubleshooting tasks ($r=0.309$). This indicates that time management is key to managing technical responsibilities and reducing frustration in problem-solving. Mentorship programs also show value; mentoring usefulness correlates positively with satisfaction in troubleshooting ($r=0.390$) and system upgrade tasks ($r=0.307$). This suggests that mentorship programs can help employees navigate challenges and adapt to technical changes more smoothly.

4.3.2. Collaboration and job satisfaction

Challenges with collaboration are associated with lower contentment with tasks that rely on teamwork, such as testing ($r=-0.327$) and presentations ($r=-0.316$). This negative relationship underscores the importance of teamwork training, as collaboration issues can reduce job fulfilment in communication-intensive tasks. Conversely, employees with strong leadership confidence report higher gratification in presentation tasks ($r=0.336$), highlighting the role of leadership development programs in building confidence for outward-facing responsibilities like public speaking and team demonstrations.

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

4.3.3. Challenges and their impact on stress and balance

The high correlation between dealing with technical issues or bugs and stress management (r=0.576) underscores the role of technical challenges in increasing workplace stress. This points to the need for both technical and stress management training. Employees who find it difficult to learn new skills also struggle with adapting to changes (r=0.550), suggesting that companies should focus on continuous skill development to foster adaptability in a dynamic environment. The strong correlation between these factors highlights the impact of stress on work-life balance (r=0.694), suggesting that businesses should prioritise stress management programs and initiatives to support balance.

4.3.4. Confidence factors and their interactions

Confidence in problem-solving is strongly linked to technical self-assurance (r=0.617), underlining the need for analytical skills training as a foundation for building domain expertise. Similarly, time management skills correlate positively with self-management (r = 0.651), showing that strong time organisation enhances overall productivity and autonomy in the workplace. Employees with confidence in managerial skills are also likely to report high levels of creativity (r=0.447), suggesting that leadership development programs could encourage creative thinking, which is essential for innovation in the IT industry.

4.3.5. The role of mentoring, feedback, and career development

The data reveal that mentoring correlates positively with perceived career growth (r=0.523), suggesting that it supports professional development by making career advancement seem more attainable. Constructive feedback also correlates with career opportunities (r=0.487), showing that an effective feedback culture can motivate employees toward professional goals. Furthermore, employees with positive perceptions of their compensation and benefits are more likely to view career advancement as achievable (r = 0.698). This highlights the motivational role that a competitive benefits package plays in fostering long-term career aspirations.

4.3.6. Culture, work-life balance, and productivity

The received feedback on work environment and culture shows a strong positive correlation with work-life balance (r = 0.727). This underscores the role of a supportive culture in helping employees achieve harmony between professional responsibilities and personal well-being. Companies that prioritise a positive work culture are likely to have more success in implementing work-life balance initiatives. Additionally, a positive work environment appears to extend beyond general culture, as satisfaction with maintenance tasks shows a moderate positive correlation with work effectiveness (r = 0.376). This suggests that employees not only benefit from an overall supportive culture but also from finding meaning in specific, routine tasks, which can enhance their performance. Maintenance tasks often represent essential, albeit repetitive, responsibilities that keep systems functioning optimally. Satisfaction in these tasks can reflect a positive work attitude, attention to detail, and resilience in handling day-to-day responsibilities. Fostering a culture that values and supports task gratification can help ensure that employees see their role's operational aspects as meaningful, thus enhancing overall productivity.

A similar moderate positive correlation (0.360) between confidence in self-management and overall productivity indicates that employees who feel capable of managing their own workload and time are more likely to be efficient. Self-management involves autonomy, discipline, and the ability to prioritise tasks effectively, which are crucial in fast-paced IT roles. Businesses should consider investing in programs that strengthen these skills, as self-management contributes to both individual performance and team efficiency. Lastly, meeting deadlines shows a positive correlation with overall productivity (r = 0.370). Adhering to timelines is essential in the IT industry, where project schedules are often stringent and delays can lead to customer dissatisfaction or additional costs. Employees who consistently meet deadlines are typically well-organised and effective in workload management, contributing to higher performance. Organisations should therefore focus on setting realistic timelines, providing resources that support efficient project management, and recognising achievements in meeting deadlines.

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

4.4. Performance drivers: A regression analysis of key predictors

This study leverages regression analysis to assess the impact of several predictors on overall success and role contentment among IT employees in Bulgaria. Employees rated their skills and goals through survey questions covering areas like communication abilities, success-tracking habits, self-management confidence, and the importance of quality work and user satisfaction. These variables were analysed to determine their influence on productivity and fulfilment.

4.4.1. Productivity Model

The regression model for productivity achieved an R^2 of 0.51, showing that 51% of the variability in productivity is explained by the included predictors. This is a robust result in social science research, suggesting that these factors have meaningful, real-world impacts on employee performance. The model's statistical significance ($p < 0.001$) further confirms that the combined effect of these predictors is unlikely due to chance, underscoring the importance of these variables.

Table 5. Regression results for predictors of productivity

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
0.71	0.51	0.5	1.12		
Table: ANOVA (overall productivity)	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	452.37	6	75.4	60.61	0
Residual	439.13	353	1.24		
Total	891.5	359			
Table: Coefficients (overall productivity)	**Unstandardised Coefficients**		**Standardised Coefficients**	**t**	**Sig.**
	B	Std. Error	Beta		
(Constant)	5.19	0.45	0	11.65	0
Speaking collaboration	0.09	0.09	0.05	1.01	0.311
Writing collaboration	0.3	0.07	0.21	4.3	0
Setting and tracking goals	-0.85	0.12	-0.27	-6.88	0
Self-management	0.49	0.07	0.29	7.29	0
Importance on high-quality work	-0.26	0.05	-0.23	-5.57	0
Importance on user satisfaction	0.36	0.05	0.29	7.02	0

The results revealed a complex relationship between collaboration skills and productivity. Writing skills emerged as a significant positive predictor, with a standardised beta coefficient (Beta) of 0.21. A one-unit increase in writing effectiveness leads to a 0.3-unit increase in performance, underscoring the importance of clear written communication in IT, where documentation and project notes are essential. Employees who effectively communicate through writing may experience smoother collaborations, fewer misunderstandings, and higher efficiency in task completion. Unlike writing skills, speaking skills did not show a significant impact on productivity, with a p-value of 0.311. This finding may reflect the industry's emphasis on written communication, such as emails, project notes, and technical documentation, over verbal interactions.

One of the most surprising findings was the negative relationship between setting & tracking goals and performance. The standardised beta for this variable was -0.27, and it showed a significant p-value ($p < 0.001$). This outcome suggests that while setting and tracking specific and measurable milestones is a common performance strategy, the process may have unintended drawbacks in this context. Tracking specific metrics could introduce added pressure or create distractions, potentially hampering overall productivity. In a field where problem-solving and creativity are crucial, rigid task-tracking may conflict with the flexibility needed for innovative thinking.

Employees' confidence in their self-management skills emerges as a strong positive predictor of performance, with a beta coefficient of 0.29 ($p < 0.001$). This result indicates that autonomous employees—those who excel

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

in time management, prioritisation, and personal accountability—are generally more productive. Self-management appears to foster a proactive attitude and resilience, helping employees handle demanding workloads effectively in the dynamic IT sector.

A somewhat counterintuitive finding was the negative relationship between the importance placed on high-quality work and productivity ($B=-0.23$, $p < 0.001$). This suggests that employees who are highly focused on quality and performance may spend additional time perfecting tasks, leading to a reduced volume of completed work. While quality is undeniably important in IT, balancing quality and productivity could be beneficial. Managers might consider providing guidelines to help employees determine when work is "good enough" to meet standards, which could help mitigate performance losses without sacrificing quality and employee performance.

User satisfaction, on the other hand, is one of the most significant positive predictors of performance, with a beta coefficient of 0.29 and a high level of significance ($p < 0.001$). Employees who prioritise user satisfaction tend to be more productive, likely because they see a direct, rewarding impact from their work. This result aligns well with motivational theories that emphasise the importance of purpose in the workplace. Employees who recognise that their work contributes to user satisfaction may be more motivated and engaged, directly enhancing overall performance. This finding suggests that emphasising the value of work to the end-user can be a powerful strategy for boosting productivity.

4.4.2. Role Satisfaction Model

The regression model for role satisfaction explains a significant portion of variability, with an R^2 of 0.68. This means that our model explains a significant portion of the variation in role gratification. The model was statistically significant ($F = 57.85$, $p < 0.001$), confirming that the predictors are collectively meaningful in explaining role satisfaction.

Table 6. Regression results for predictors of role satisfaction

R	**R Square**	**Adjusted R Square**	**Std. Error of the Estimate**		
0.83	0.68	0.67	0.5		
Table: ANOVA (role satisfaction)	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	184.65	13	14.2	57.85	0
Residual	84.95	346	0.25		
Total	269.6	359			
Table: Coefficients (role satisfaction)	**Unstandardised Coefficients**		**Standardised Coefficients**	**T**	**Sig.**
	B	Std. Error	Beta		
(Constant)	1.89	0.26	0	7.33	0
Application to offer time	-0.11	0.03	-0.12	-3.67	0
Hiring transparency	0.05	0.04	0.04	1.24	0.216
Preparation role	0.06	0.03	0.09	2.29	0.023
Time management	0.11	0.04	0.1	2.66	0.008
No progress measurement	-1.27	0.24	-0.19	-5.39	0
Training usefulness	0.14	0.04	0.13	3.72	0
Career advancement resources usefulness	0.17	0.04	0.22	4.4	0
Usefulness of compensation & benefits resources	-0.02	0.04	-0.03	-0.47	0.64
Culture support usefulness	-0.02	0.04	-0.02	-0.38	0.706
Work-life balance feedback usefulness	0.04	0.04	0.06	1.13	0.258
Deadlines success	-0.2	0.03	-0.22	-6.54	0
Compensation satisfaction	0.26	0.03	0.35	8.21	0
Work environment comfort	0.04	0.03	0.05	1.18	0.24

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

Among all variables, satisfaction with compensation (including pay, bonuses, and incentives) showed the strongest positive impact on role fulfilment (B = 0.26, p < .001). Employees who reported higher financial gratification tended to have much higher levels of role satisfaction, suggesting that competitive remuneration is a primary driver of contentment within roles. Career advancement resources also play a critical role in shaping role satisfaction, as reflected by a standardised beta of 0.22 (p < 0.001). This aligns with the idea that employees are more likely to be satisfied when they see clear pathways for growth within the company.

Similarly, the usefulness of training resources had a significant positive effect on role satisfaction (B = 0.14, p < .001), indicating that employees value the support and development offered by their companies. Investing in effective training programs can, therefore, have a substantial impact on employee satisfaction. Preparation for the role also shows a positive association with fulfilment, with a beta coefficient of 0.09 (p = 0.023). This finding highlights the importance of a thorough hiring process that equips new hires with the skills and knowledge necessary for their responsibilities. In addition, employees with strong time organisation skills who can effectively prioritise tasks and manage workloads reported higher satisfaction (B = 0.11, p = .008). This suggests that offering time management support could enhance overall job contentment. The extent to which employees feel prepared for their roles, based on the hiring and onboarding process, also influences satisfaction.

This model also identifies two strong negative predictors of role satisfaction: lack of progress measurement (B=−0.19, p < 0.001) and difficulties in meeting deadlines (B=−0.22, p < 0.001). Employees who lack tools or systems to monitor their success experience significantly lower role fulfilment, suggesting that providing mechanisms for performance evaluation could enhance their sense of achievement and satisfaction. Similarly, employees who struggle to meet deadlines report lower job contentment, indicating that support for time management and realistic project timelines (Krumova, 2024) could improve satisfaction levels. The model also identifies a minor negative impact on role fulfilment associated with lengthy application-to-offer times (B=−0.12, p < 0.001). Streamlining the hiring process could have positive downstream effects on employee fulfilment by reducing delays and uncertainties for prospective employees.

Certain factors like hiring transparency and work environment comfort, while potentially important to overall employee experience did not show a statistically significant impact on role satisfaction in this analysis. While these areas may contribute to general employee experience and organisational culture, they were not significant predictors of role fulfilment in this model. This does not imply they are unimportant but suggests they may not directly influence job contentment as strongly as the other factors examined. In summary, both productivity and role satisfaction are shaped by a combination of individual skills, organisational support, and workplace conditions. Written collaboration skills, self-management, and user experience are key to performance, while compensation, career advancement opportunities, and training resources are central to role fulfilment. Balancing quality with productivity, setting up performance assessment mechanisms thoughtfully, and supporting employees in time management are practical strategies that businesses can implement to foster an efficient, successful and satisfied workforce.

4.5. Interactive effects on employee success and satisfaction: A moderation analysis

To further explore the relationships identified in the primary regression analysis, a moderation analysis was conducted. This analysis examined whether specific predictor variables interact to affect productivity and role satisfaction, providing insights into their combined influence. By assessing interaction effects, the study aimed to understand how the impact of one predictor might vary depending on the level of another.

As part of the moderation analysis, all continuous predictor variables used in interaction terms were mean-centred. Mean-centering, which involves subtracting the variable's mean from each observed value, helps to reduce multicollinearity between predictors and their interaction terms, making it easier to interpret the interaction effects. The mean-centering formula applied for each predictor variable X is: $X_{mc} = X - \bar{X}$ where:

- X_{mc} represents the mean-centred value of the variable X
- X is the original score of the variable,

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

- $\bar{X}$ is the mean of X, calculated as: $\bar{X} = \frac{1}{N}\sum_{i=1}^{N} \mathrm{X_i}$ where N is the total number of observations.

By mean-centring, we ensure that each variable has a mean of zero, which simplifies the interpretation of regression coefficients in the presence of interaction terms. Following mean-centring, interaction terms were created by multiplying the mean-centred versions of the relevant predictor variables. Each interaction term reflects the joint influence of two predictors, indicating whether the effect of one predictor on the dependent variable modifies based on the level of the other predictor. The general formula for creating an interaction term between two mean-centred predictors X_{mc} and Z_{mc} is $Interaction\ Term = X_{mc} \times Z_{mc}$.

The interaction terms were included in the regression models as additional predictors alongside the main effects of each variable. Each interaction term was included in a separate regression model to assess its effect on the dependent variables: overall productivity and role satisfaction. The focus of the moderation analysis was on the interaction term regression coefficients, which indicate whether the effect of one predictor depends on the level of the other. Significant interaction effects were interpreted as evidence of moderation, suggesting that the relationship between one predictor and the outcome variable changes in the presence of the other predictor.

5. Findings and interpretation of interaction effects

The interaction between confidence in self-management and goal setting/monitoring was tested to determine whether performance measurement practices moderate the relationship between self-management confidence and overall productivity. The interaction term, however, was not statistically significant (B=0.23,p=0.268), suggesting that the effect of self-management on productivity remains consistent regardless of the extent to which employees engage in setting goals and tracking them. This finding implies that confidence in self-management contributes to work effectiveness independently of success-tracking habits, which may indicate that employees who are adept at managing their tasks and responsibilities do not necessarily require structured task-tracking. In this context, each predictor appears to exert an independent influence on performance and success without reinforcing or detracting from each other's effects.

A significant positive interaction effect was found between the importance placed on user experience and emphasis on high-quality work (B=0.16, p<0.001). This interaction suggests that, although focusing solely on high-quality work may sometimes be associated with lower overall performance, combining it with a focus on user satisfaction can mitigate this effect. Specifically, when both user satisfaction and high-quality work are valued, outcomes are more favourable than when high-quality work is prioritised alone. This indicates that a dual emphasis on quality and user satisfaction helps counterbalance potential losses from focusing exclusively on quality. From an organisational perspective, fostering an environment that values both quality and user satisfaction may lead to greater productivity gains, as employees are encouraged to deliver results that meet end-user needs while maintaining high standards.

In contrast, a significant negative interaction was found between financial gratification and the perceived usefulness of career advancement resources in relation to role satisfaction (B=−0.13, p<0.001). This result suggests that while both high compensation satisfaction and career opportunities independently boost role satisfaction, their combined effect is less than the sum of their individual impacts. In other words, for employees who prioritise career development and perceive ample growth opportunities within the company, the positive effect of high compensation on role satisfaction is somewhat diminished. This finding implies a partial substitutive relationship between compensation and career advancement; employees focused on career growth may derive satisfaction more from professional development opportunities than from monetary rewards alone. Businesses may consider balancing compensation with career advancement resources to maximise role satisfaction, particularly for employees with strong career progression aspirations.

The analysis also examined whether time management skills and work-life balance resources interact to influence role satisfaction. This interaction was not statistically significant, indicating that these two factors

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

contribute independently to satisfaction. Employees with effective time management skills tend to report higher fulfilment, likely due to their ability to prioritise tasks and handle workloads efficiently. Similarly, work-life balance resources independently promote satisfaction by helping employees manage job demands relative to personal time. The lack of interaction implies that organisations may invest in both areas separately to support employee happiness. Finally, the interaction between writing skills and confidence in overall communication skills was also non-significant ($B=-0.07$, $p=0.296$), indicating that the relationship between writing and employee performance remains unaffected by an individual's confidence in broader communication abilities. Effective writing may be sufficient to support productivity, especially in work environments that prioritise written documentation or where clear written instructions are essential. This result reinforces the idea that strong writing skills alone can be a critical asset for success, independent of other communication and collaboration abilities, suggesting that companies might prioritise training in writing skills to enhance employee performance and success.

6. Discussion

This research examined the demographic profile, technical skill distribution, and key determinants of performance, success, and role satisfaction within the Bulgarian IT sector. The data reveal a marked gender imbalance in specialised technical roles, with disparities becoming more pronounced at senior levels. This trend indicates possible obstacles to career progression for women, highlighting the presence of a possible barrier limiting their advancement potential, which aligns with global research on gender disparities in tech (Fox-Robertson & Wójcik, 2024). Given the strong correlation between technical expertise and seniority, addressing these constraints may require targeted organisational interventions, such as mentorship programs, to support career growth and retention among women in IT. Future research should delve deeper into the structural and cultural factors that may inhibit female advancement in Bulgarian tech roles, adding granularity to the understanding of industry-specific obstacles.

The results from factor analysis further highlight critical workplace experience dimensions that shape employee satisfaction and advancement potential, particularly in relation to work-life balance and support systems. High factor loadings on work-life balance variables underscore a common challenge in the IT sector, where demanding workloads and time constraints contribute to stress and potentially reduce job fulfilment. These findings echo prior research, showing that work-life conflict often detracts from overall job satisfaction (Aruldoss, Kowalski, & Parayitam, 2021). To mitigate these effects, Bulgarian IT firms could prioritise supportive mechanisms such as flexible work schedules and wellness resources, fostering a workplace environment that supports employees' well-being and enhances job contentment.

Regression and moderation analyses provided nuanced insights into how individual and organisational factors interact to influence productivity and role gratification. Notably, self-management confidence was positively associated with productivity, yet its interaction with goal-setting practices was not statistically significant. This suggests that self-managed employees may thrive in IT roles without rigid monitoring, likely due to the adaptive, problem-solving nature of IT work. These findings indicate that autonomy skills could operate independently from goal-setting routines, highlighting an opportunity for IT firms to promote autonomous work styles, especially in roles requiring high adaptability.

On the other hand, a positive interaction between user satisfaction and quality emphasis indicates that balancing quality assurance with user-centric approaches is pivotal for optimal performance. When employees focus on both quality and user impact, they tend to experience increased productivity and job fulfilment, perceiving their work as both purposeful and impactful. This finding aligns with theories on purpose-driven work, which posit that connecting tasks to clear, valued outcomes fosters motivation and enhances performance (Meyer, Roy, Lam, & Damon, 2022). For IT businesses, this dual focus on quality and user satisfaction could thus serve as a strategic approach to increase both employee engagement and end-user experience, ultimately benefiting organisational performance.

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

Financial gratification emerged as a primary predictor of overall job fulfilment. However, the moderation analysis indicated a partial substitutive relationship with career advancement resources. Employees who prioritise career development gain greater satisfaction from growth opportunities compared to solely receiving wage enhancements. This suggests that companies should offer competitive remuneration and provide visible career pathways, particularly for high-potential employees whose happiness is closely tied to their professional growth prospects.

These insights have practical implications for hiring and onboarding processes as well. Employees who perceive their roles as clearly defined and achievable reported higher levels of contentment, emphasising the value of structured onboarding programs that clarify role expectations and provide comprehensive training. Moreover, streamlining the hiring process may improve job fulfilment and long-term commitment, as prolonged recruitment timelines were associated with lower overall satisfaction.

7. Limitations and future research directions

This study provides substantial insights into the demographic, technical, and psychological factors influencing performance and satisfaction in the Bulgarian IT sector. However, several limitations warrant consideration. First, while the research captures a wide array of factors influencing employee experience, it relies heavily on self-assessment measures. Self-reported data on technical skills, expertise, and job satisfaction may introduce biases, as individuals may overestimate or underestimate their abilities and satisfaction levels. Including objective performance metrics or 360-degree feedback could enhance the reliability of these findings in future studies. Additionally, while regression and moderation analyses provide valuable insights, they do not account for potential causal relationships. Future studies employing longitudinal data could offer a more robust analysis of causation, allowing researchers to observe the long-term impacts of workplace interventions and individual factors on employee outcomes.

Following this line of thought, the findings of this study open multiple avenues for further research aimed at fostering inclusive and productive work environments in the IT industry. One key area for future exploration is the strong correlation between stress and maintaining a healthy separation between work and home, as IT companies would benefit from exploring organisational strategies for managing job-related anxiety. Future research could examine the efficacy of various balanced lifestyle approach campaigns, such as flexible working hours, wellness programs, and remote work options, in reducing stress and improving job fulfilment. Experimental studies could assess which types of work-life interventions are most effective for different demographic groups within the IT sector, considering variables like role type, seniority, and family responsibilities.

Another promising research direction is the aligned focus on user needs and quality for enhancing productivity. Investigating how businesses can balance these objectives effectively could yield actionable strategies for maximising both performance and end-user happiness. Future studies might explore training programs that synchronise technical rigour with client-centred approaches, examining how different instructional designs impact both the quality of technical output and the user experience. Additionally, exploring the role of feedback culture in this balance would provide insights into how feedback delivery style affects employee motivation and work quality.

Lastly, considering the partial interchangeability between compensation satisfaction and career development opportunities, future research should investigate how to optimise these elements within organisational reward structures. Experimental studies examining the impacts of transparent career paths versus remuneration increases on employee retention and satisfaction could inform best practices for talent management. Expanding the research to examine the role of non-monetary incentives, such as skill-building resources and leadership training, may further clarify how organisations can build comprehensive reward systems that enhance job fulfilment and professional growth.

ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

In summary, addressing these limitations and extending the research into new areas can provide more comprehensive guidance on promoting diversity, reducing stress, and balancing quality and user satisfaction in the IT sector. These insights would be valuable for developing policies and interventions that contribute to a sustainable and satisfying work environment for all employees.

Conclusions

In conclusion, this study reveals key insights into factors influencing performance, satisfaction, and overall success among IT professionals in Bulgaria. Role scope stands out as a significant contributor to self-assessed competence, with professionals in multi-functional roles reporting higher levels of expertise than those in specialised roles. Leadership roles further correlate with elevated confidence, suggesting that career breadth and seniority positively influence self-perceived technical abilities. This emphasises the value of promoting skill diversity and cross-functional training to cultivate a versatile and assured workforce.

Work-life balance challenges emerged as another pivotal factor, highlighting ongoing issues related to employee stress, time management struggles, and overtime demands. These findings suggest that current mechanisms may fail to address these challenges effectively. Enhancing support systems, such as by introducing flexible work arrangements and stress management resources, could mitigate these issues, fostering a more engaged and retained workforce.

Employee satisfaction is also shaped significantly by rewards, growth opportunities, and recognition, with compensation, career advancement pathways, and a positive feedback culture as critical drivers. The Bulgarian IT sector can enhance job satisfaction and retention by emphasising fair remuneration, establishing clear progression roadmaps, and nurturing a culture that values recognition. This approach directly impacts employees' perceptions of their roles and their sense of value within the company.

The research underscores the importance of core skills like time organisation, self-discipline, and effective communication, which are crucial for productivity and job satisfaction. High productivity is particularly associated with self-management skills, pointing to the need for businesses to support employees in developing these competencies. Additionally, writing skills emerged as an essential productivity factor, reflecting the industry's reliance on clear documentation and communication.

Interactive effects between user satisfaction and quality further reveal that a combined emphasis on these elements maximises productivity and engagement. Aligning organisational goals with end-user satisfaction and quality standards enhances performance and fosters a more motivated and purpose-driven workforce. This coupled focus can thus contribute to creating a results-oriented and highly engaged team.

Finally, findings indicate that financial gratification and career development serve as complementary satisfaction factors, although high career development aspirations may reduce the impact of compensation alone on role satisfaction. Professional growth often takes precedence over financial incentives for employees intensely focused on career advancement, suggesting that a balanced approach, combining monetary rewards with clear advancement opportunities, may yield optimal results for employee satisfaction.

This study highlights multiple factors shaping employee experiences within Bulgaria's IT sector. Addressing work-life balance issues, fostering skill diversity, and offering clear pathways for growth and recognition can collectively enhance performance, job satisfaction, and retention. These strategies provide practical insights for organisations striving to cultivate a more dynamic, resilient, and successful workforce in a rapidly evolving industry.

References

AIBEST. (2020). AIBEST Annual Report. Sofia: Association for Innovation, Business Excellence, Services and Technology. Retrieved from https://aibest.org/annualreport2020

Aruldoss, A., Kowalski, B., & Parayitam, S. (2021). The relationship between quality of work life and the work-life-balance mediating role of job stress, job satisfaction and job commitment: Evidence from India. *Journal of Advances in Management Research*, 18(1), 36-62. http://doi.org/10.1108/JAMR-05-2020-0082

BASSCOM. (2023). Annual Report On the State of the Software Sector in Bulgaria. Research, CBN - Pannoff, Stoytcheff & Co, Bulgarian Association of Software Companies, Sofia. Retrieved from BASSCOM: https://api.basscom.org/uploads/BASSCOM_Barometer_EN_2023_bf3538fc4f.pdf

Bell, M., Cake, M., & Mansfield, C. (2019). Success in career transitions in veterinary practice: perspectives of employers and their employees. *Vet Record*, 185, 232-232. http://doi.org/10.1136/vr.105133

Boehm, J., & Lyubomirsky, S. (2008). Does happiness promote career success? *Journal of Career Assessment*, 16(1), 101-116. http://doi.org/10.1177/1069072707308140

Campbell, J. (1990). Modeling the performance prediction problem in industrial and organisational psychology. In M. Dunnette, & L. Hough (Eds.), Handbook of industrial and organisational psychology (pp. 687-732). Palo Alto, CA: Consulting Psychologists Press. Retrieved from archive.org/embed/handbookofindust02ehav

Đorđević, N. (2021). Retrieved October 10, 2021, from Emerging Europe: https://emerging-europe.com/after-hours/how-the-pravetz-82-introduced-a-generation-of-bulgarians-to-the-computer/

Duque, R., Collins, M., Abbate, J., Azambuja, C., & Snaprud, M. (2007). History of ICT. In W. Shrum, K. Benson, W. Bijker, & K. Brunnstein (Eds.), Past, Present and Future of Research in the Information Society (pp. 33-45). Boston, MA: Springer. http://doi.org/10.1007/978-0-387-47650-6_3

Fang, R., Gao, B., & Hu, N. (2021). Intangible asset value of employee satisfaction in high-contact services. International *Journal of Hospitality Management*, 94, 102810. http://doi.org/10.1016/j.ijhm.2020.102810

Fox-Robertson, C., & Wójcik, D. (2024). The triple glass ceiling: FinTech gender inequalities. *Finance* and Society, 10(2), 137-156. http://doi.org/10.2218/fas.2023.16

Hemsworth, D., Muterera, J., Khorakian, A., & Garcia-Rivera, B.R. (2024). Exploring the Theory of Employee Planned Behavior: Job Satisfaction as a Key to Organizational Performance. *Psychological Reports* http://doi.org/10.1177/00332941241252784

Hogan, R., Chamorro-Premuzic, T., & Kaiser, R. (2013). Employability and career success: bridging the gap between theory and reality. *Industrial and Organisational Psychology*, 6(1), 3-16. http://doi.org/10.1111/iops.12001

International Trade Administration. (2024). Leading Sectors for US Exports & Investments. Retrieved from https://trade.gov/country-commercial-guides/bulgaria-information-and-communications-technologies

Krumova, Y. (2024). Development Timelines as a Competitive Pricing Strategy in Software Engineering. Bulgarian electronic scientific journal "Business Management", 34-47. Retrieved from https://spisanie-su.eu/wp-content/uploads/2024/06/Br_1_2024_FINAL_S.pdf#page=35

Lawler, E. E., & Porter, L. W. (1967). The effect of performance on job satisfaction. *Industrial Relations*, 7(1), 20-28. http://doi.org/10.1111/j.1468-232X.1967.tb01060.x

Melián-González, S., Bulchand-Gidumal, J., & López-Valcárcel, B. (2015). New evidence of the relationship between employee satisfaction and firm economic performance. *Personnel Review*, 44(6), 906-929. http://doi.org/10.1108/PR-01-2014-0023

Meyer, M., Roy, C., Lam, C., & Damon, S. (2022). Corporate purpose and employee sustainability behaviours. *Journal of Business Ethics*, 183(4), 933-951. http://doi.org/10.1007/s10551-022-05090-5

Murphy, K., & Cleveland, J. (1995). Understanding performance appraisal: Concepts, issues, and applications (1 ed.). (K. Murphy, & J. Cleveland, Eds.) Thousand Oaks, CA: SAGE Publications.

NCube. (2022). Retrieved July 20, 2022, from Bulgarian IT Industry: An Overview: https://ncube.com/bulgarian-it-industry-an-overview

Osmani, F., & Maliqi, G. (2012). Performance management, its assessment and importance. Procedia - Social and Behavioral Sciences, 41, 434-441. Retrieved from https://core.ac.uk/download/pdf/82210007.pdf

Pepple, D.G., & Ambilichu, C.A. (2024). Performance appraisal and employee commitment: The mediating role of job satisfaction. *European Management Review*, 21(1), 237-250. http://doi.org/10.1111/emre.12583

Pradhan, R., & Jena, L. (2017). Employee Performance at Workplace: Conceptual Model and Empirical Validation. *Business Perspectives and Research*, 5(1), 69-85. http://doi.org/10.1177/2278533716671630

Prentice, S.B. (2022). Job satisfaction or employee engagement: regardless of which comes first, supportive leadership improves them both. *Advances in Developing Human Resources*, 24(4), 275-285. http://doi.org/10.1177/15234223221112504

Raza, S.A., & Yousufi, SQ. (2023). Transformational leadership and employee's career satisfaction: role of psychological empowerment, organisational commitment, and emotional exhaustion. *Asian Academy of Management Journal*, 28(2), 207-238 http://doi.org/10.21315/aamj2023.28.2.8

Rubio-Valdehita, S., Díaz-Ramiro, E., & López-Núñez, M. (2023). What does the feeling of job success depend on? Influence of personal and organisational factors. *Societies*, 13(6), 140. http://doi.org/10.3390/soc13060140

Saari, L., & Judge, T. (2004). Employee attitudes and job satisfaction. *Human Resource Management*, 43(4), 395-407. http://doi.org/10.1002/hrm.20032

Shafagatova, A., Van Looy, A., Shamasbi, S.M. (2023). Uncovering the Combined Impact of Process Characteristics and Reward Types on Employees' Job Satisfaction: A European Quantitative Study. *Sage Open*, 13(1) http://doi.org/10.1177/21582440231160125

Shah, N.M.T.L., Bano, S., Saraih, U.N., Abdelwaheed, N.A.A., Soomro, B.A (2024). Developing organisational performance through talent management practices: employee satisfaction's mediating role in learning organisations. *Business Process Management Journal*, 30(3), 641-670. http://doi.org/10.1108/BPMJ-03-2023-0208

Stefanov, R., Boeckholt, P., & Pontikakis, D. (2021). POINT Review of Industrial Transition of Bulgaria. Luxembourg: Publications Office of the European Union. http://doi.org/10.2760/241737

Trikha, R. (2016). Which Country Would Win in the Programming Olympics? HackerRank. Retrieved from https://hackerrank.com/blog/which-country-would-win-in-the-programming-olympics

Funding: This research was funded by Prof. Dr. Asen Zlatarov University – Burgas. Bulgaria. Project NIH 485/2023

Data Availability Statement: More primary data be obtained from the corresponding author on a reasonable request.

Author Contributions: The authors contribute equally. All authors have read and agreed to the published version of the manuscript.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 234'5-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/j8746832232

Ivan DIMITROV is a Professor Dr in the Department of Economics and Management, Prof. Dr. Asen Zlatarov University – Burgas, Bulgaria. Research interests: Strategic Management, Operations, and Supply Chain Management.
ORCID ID: https://orcid.org/0000-0003-4653-8634

Yoana KRUMOVA is a Ph.D. student in the Department of Economics and Management, Prof. Dr. Asen Zlatarov University – Burgas, Bulgaria. Research interests: Talent Acquisition and Management, Strategic Management
ORCID ID: https://orcid.org/0009-0006-7731-7032

Adile DIMITROVA is an Associate Prof. Dr., Department of Economics and Management, Prof. Dr. Asen Zlatarov University – Burgas, Bulgaria. Research interests: Strategic Management, Operations and Supply Chain Management, Leadership, Human Resource Management.
ORCID ID: https://orcid.org/0000-0002-5883-1478

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

Publisher
http://jssidoi.org/esc/home

INNOVATIVE PATHWAYS TO A CIRCULAR ECONOMY IN SAUDI ARABIA AND ITS SPILLOVER EFFECTS ON THE ARAB REGION*

Ghada Alturif [1], Wafaa Saleh [2], Mohamed Ramadan A. Rezk [3], Mohammed Mahgoub Hassan [4], Leonardo Piccinetti [5], Alaa A. El-Bary [6,7,8]

[1] Department of Social Work, College of Humanities and Social Sciences, Princess Nourah bint Abdulrahman University, P.O. Box 84428, Riyadh 11671, Saudi Arabia
[2] School of Computing, Engineering and the Built Environment, Edinburgh Napier University, 10 Colinton Road, Edinburgh EH10 5DT, Scotland, UK
[3] Academy of Scientific Research and Technology, Cairo, Egypt
[4] National Center for Research, Ministry of Higher Education and Scientific Research, Khartoum- Sudan
[5] Sustainable Innovation Technology Services Ltd, Ducart Suite, Castletroy, Ireland
[6] Arab Academy for Science, Technology and Maritime Transport, P.O.Box 1029, Alexandria, Egypt
[7] National Committee for Mathematics, Academy of Scientific Research and Technology, Egypt
[8] Council of future studies and risk management, Academy of Scientific Research and Technology, Egypt

E-mails: [1] gaaltarif@pnu.edu.sa; [2] W.saleh@napier.ac.uk; [3] mramadan79@gmail.com; [4] mohkadis@yahoo.com; [5] leonardo@sinnovations.org; [6,7,8] aaelbary@aast.edu

Received 10 August 2024; accepted 11 November 2024; published 30 December 2024

Abstract. This paper examines the transition towards a Circular Economy (CE) in Saudi Arabia and its potential spillover effects on the Arab region. The concept of a Circular Economy is based on stimulating production that reduces waste and pollution, keeping revenues and consumption expenditures within a closed circle. The paper will follow the numerous pathways of innovation that Saudi Arabia is taking to develop sustainability in the light of technological advancements, policy innovations, and new business models. SWOT analysis of the identification of strengths, weaknesses, opportunities, and threats in implementing CE practices in the Kingdom; the advanced waste management, recycling initiatives, water conservation efforts, and closing with the importance of research and development. The paper highlights how Saudi Vision 2030 underlines those initiatives directed toward economic diversification, environmental sustainability, and reducing the Kingdom's reliance on oil revenues. This paper also attempts to identify how the CE efforts of Saudi Arabia are likely to impact regional collaboration and policy harmonisation, promoting economic and environmental benefits related to the Arab region. The findings underscore that the strategic investments and policy commitments will render the Kingdom a sustainable and resilient economy. The paper also discusses how public-private partnerships and international collaborations may drive the CE agenda. In a nutshell, the Kingdom of Saudi Arabia is best positioned to lead the Arab region in the practice of CE, thereby contributing to regional economic integration, promoting environmental sustainability in the Arab region, and tying the region to global sustainability efforts.

Keywords: circular economy; Saudi Arabia Vision 2030; sustainability; spillover

Reference to this paper should be made as follows: Alturif, G., Saleh, W., Rezk, M.R.A., Hassan, M.M., Piccinetti, L., El-Bary, A.A. 2024. Innovative pathways to a circular economy in Saudi Arabia and its spillover effects on the Arab Region. *Entrepreneurship and Sustainability Issues*, 12(2), 314-332. http://doi.org/10.9770/r4742847527

JEL Classifications: Q1, Q32

Additional disciplines: political sciences; ecology and environment

* *The authors extend their appreciation to Princess Nourah bint Abdulrahman University Researchers Supporting Project number (PNURSP2024R705), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.*

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

1. Introduction

A Circular Economy (CE) is a model designed to minimise waste and pollution while optimising the value of products and materials through practices like sharing, leasing, reusing, repairing, refurbishing, and recycling (Rezk et al., 2023). As it is, the model of the world economy is linear. This refers to extracting and processing natural resources to make products that frequently harm the environment and massive waste of natural resources that deplete biodiversity (Sariatli, 2017). Out of reaction to these risks and their associated high costs, governments and civil society have explored and promoted the transition to a Circular Economy. One can define a Circular Economy as a global socioeconomic model centring on improving resource efficiency and reducing an interacting environmental impact, closing material and energy loops, fostering innovation and all means toward sustainable prosperity (Smol & Marcinek, 2023). The model of the Circular Economy acts as the mainstay in modern economies; therefore, this becomes a container for a good deal of the green economy, sustainable economy, biological economy, and purposeful economy. Most, if not all, of the hypothesised models lead to harmony and an outstanding balance between pursuing economic goals and preserving the environment (Abrosimova et al., 2020).

The CE model accentuates a shift to a more sustainable economic system with efficient use of resources, long life of products, recycling, waste reduction, and other modalities that help allay risks of climate change and support the achievement of Sustainable Development Goals (Odia, 2021). Moreover, the circular economy reduces waste from production processes and promotes an environmentally conscious image for businesses, which increases ecological added value, lowers emissions, and increases wealth (Nowicki et al., 2023). The circular economy has received increasing attention from international organisations such as the United Nations and policymakers in developed countries (European Commission, 2015). However, in many low- and middle-income countries, the practical contributions of the circular economy approach have received little attention (Halog & Anieke, 2021).

One of the recent indicators in measuring countries' performances is the 2023 Circular Carbon Economy (CCE) Index (Figure 1), which gives a comparative overview of countries' position on the path to net carbon and the extent of preparedness to get there. The CCE Index rolls up quantitative data points from 38 robust sources on a composite index that covers countries representing about 90% of the global economy and carbon dioxide emissions. Saudi Arabia ranks 20 globally, with some other Arab countries, like the United Arab Emirates, Qatar, and Egypt, ranking in the top 30 countries worldwide (KAPSARC, 2024).

Developed countries like Japan, Netherlands, and Germany have implemented comprehensive CE policies. These include modern waste management systems, large recycling initiatives, and considerable incineration, pyrolysis, and anaerobic digestion expenditures. For instance, the Japanese approach to the circular economy is structured and harmonised. Its root is the "Basic Act for Establishing a Sound Material-Cycle Society," emphasising recycling, using effectively available resources, and reducing waste generation. The effect of this system would be a host of policies, including the Home Appliance Recycling Law, calling for the compulsory recycling of household appliances (Arai et al., 2023). In addition, the European Union has implemented the Circular Economy Action Plan to enhance the circularity of products, reduce waste, and retain resources within the EU economy for as long as possible. Two crucial actions in this sense are the Waste Framework Directive and the Eco-design Directive, which have laid stringent standards in waste management and product design (Mazur-Wierzbicka, 2021).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

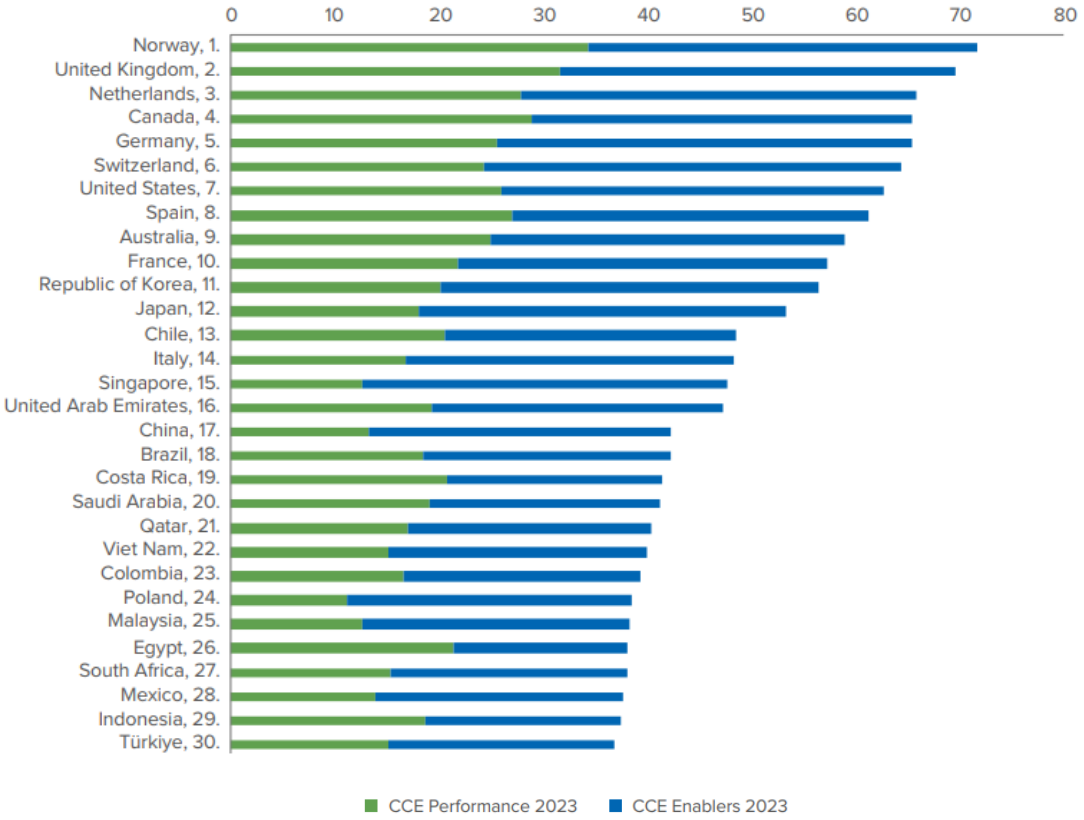


Figure 1. Top 30 countries on CCE Index 2023
Source: KAPSARC, 2024

The Netherlands is the forerunner of circular economy principles. It established ambitious goals for using at least 50% fewer primary raw materials by 2030 and a fully circular economy by 2050. This includes the Amsterdam Circular initiative on sustainable urban planning and waste management and the Green Deals establishing public-private cooperation for promoting circular projects (Verrips et al., 2019). Germany has a robust recycling culture and a well-developed framework for a circular economy; therefore, it has implemented the Packaging Act to promote recycling and the reutilization of packaging material. It also developed the Resource Efficiency Program to enhance resource efficiency in all sectors. Good waste collection and processing infrastructure, coupled with strict regulation, makes Germany one of the leading countries in implementing a circular economy (Ogunmakinde, 2019).

On the other hand, the situation is different in Arab countries, all at varied levels of implementation. Some countries, such as Jordan, Morocco, and the UAE, launched a national strategy promoting CE. Most of these countries have their agenda focused, in this regard, on reducing landfill use by increasing their respective recycling rates. Egypt is still in its CE initiative, which has done a lot, especially regarding improvements in waste management and efficient use of resources (Rezk et al., 2023). As such, transitioning into a circular economy presents challenges but simultaneously creates opportunities for the Kingdom of Saudi Arabia. There is a sizable volume of literature on various aspects of the circular economy in Saudi Arabia that provides insight into the potential benefits that may be available for enjoyment and obstacles to be overcome in the transition. (Almadhi et al., 2023; Yusuf & Lytras, 2023; Ali et al., 2022).

During its G20 presidency, Saudi Arabia proposed to the Gulf Cooperation Council to implement a circular economy model, partly guided by circular economy models developed within the framework of the EU Circular Economy Action Plan, which represents sustainable competitiveness in a variety of critical sectors such as electronics, energy, vehicles and packaging, water, etc .The ongoing circular economy model is expected to include all pre-existing circular economy initiatives in the GCC region while benefiting from the experiences of other countries and cooperation with the European Union (Yusuf & Lytras, 2023).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

Given its enormous reserves and high production capacity, Saudi Arabia has played a leading role in the global oil and gas industry. It is the world's largest producer and exporter of oil, holding more than 260 billion barrels of proven reserves—equivalent to a quarter of the world's total (Hamieh et al., 2022). Since 2021, tangible improvements in Saudi Arabia's non-oil sectors have accelerated and grown to an average of 4.8% in 2022 due to strong domestic demand. On the other hand, the 2023 prospects maintain an estimated growth of about 5% for non-oil sectors, indicating their prosperity and importance in diversifying the economy from the oil-dependence system. (IMF, 2023).

In 2021, the services sector dominated the economic structure of Saudi Arabia, consisting of 52 per cent of its GDP. Other industrial activities came second, with 33 per cent; manufacturing took 13 per cent of the GDP. Agriculture contributed a minimal proportion, representing only 2% of the economic output (Figure 2). Private consumption contributed the most to GDP at 41% compared to expenditure. Government consumption and fixed investment made a contribution of 24% each to GDP, underlining significant contributions to come from the public sector and capital formation in this economy as well. The net exports component retains 11%, indicating the country's trade balance and export activities. (IMF, 2022).

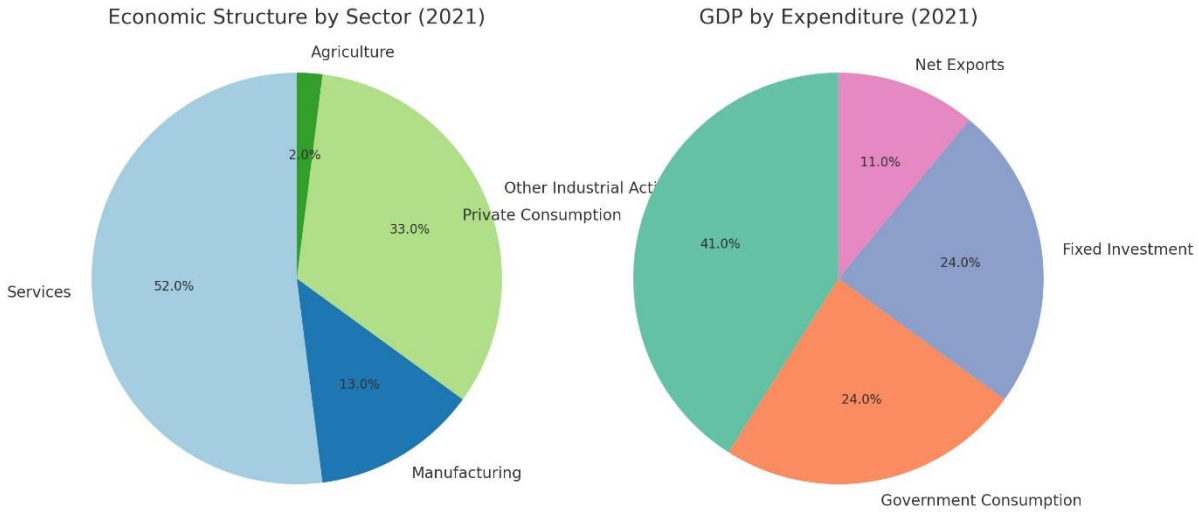


Figure 2. Saudi Arabia's economic structure by sector and GDP by expenditure for the year 2021
Source: IMF, 2022

In Saudi Arabia, industrial growth, rapid urbanisation (83% of the population living in cities as of 2010), and a high-consumption lifestyle has led to many environmental issues, including the degradation of ecosystems, depletion of natural resources, and extensive environmental pollution (Abubakar & Dano, 2019). According to the National Center for Waste Management, in 2021 only, the degradation to the environment from solid waste reached $1.3 billion, which was mainly generated by large urban centres: Riyadh, Jeddah, and Dammam, with corresponding contributions of 21%, 14%, and 8% with landfills all over the country nearing total capacity. The waste generated in Saudi Arabia is shown in Figure 3. The general trend indicates that Municipal Solid Waste (MSW) generation is increasing yearly, highlighting the need for enhanced waste management strategies to cope with growing waste (Almadhi et al., 2023).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

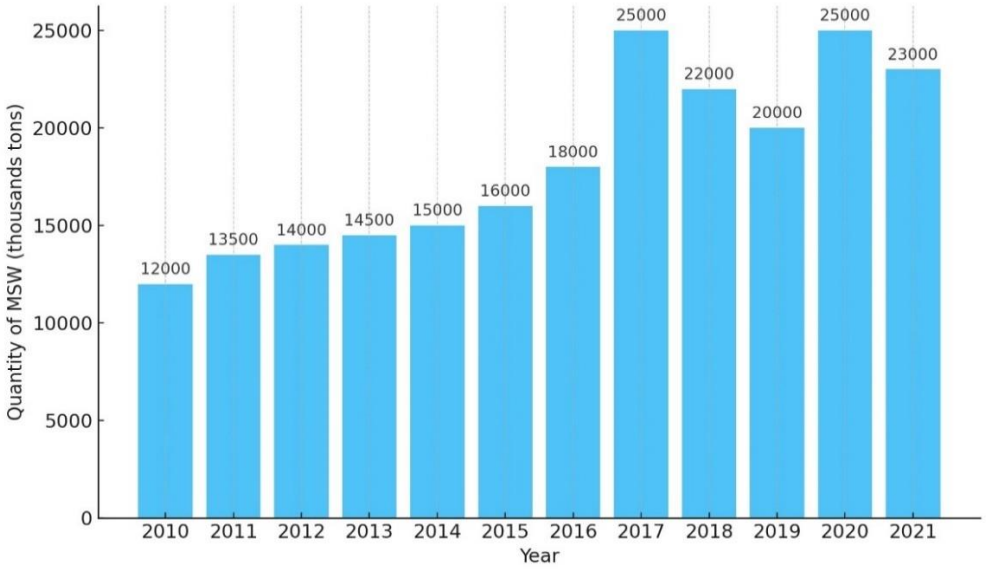


Figure 3. Quantity of MSW in Saudi Arabia
Source: Almadhi et al., 2023

Typical of this is a firm reliance on throwaway items, particularly single-use plastics, pointing out minimal recycling. Much of this waste is either landfilled without treatment or incinerated, with long-term environmental implications, as these locations are lost to any other use once filled. Landfills are generally poorly engineered in Saudi Arabia and mirror continuing problems with waste management (Sulami et al., 2024; ITA, 2024). District-wise, the residential composition of municipal solid wastes in Saudi Arabia significantly differs around urban activities and population density Figure (4), covering food wastes (40–51%), paper (12–28%), cardboard, 7%, plastics, (5–17%), glass, (3–5%), wood, (2–8%), textiles, (2–6%), and metals, (2–8%) (Nizami, 2024).

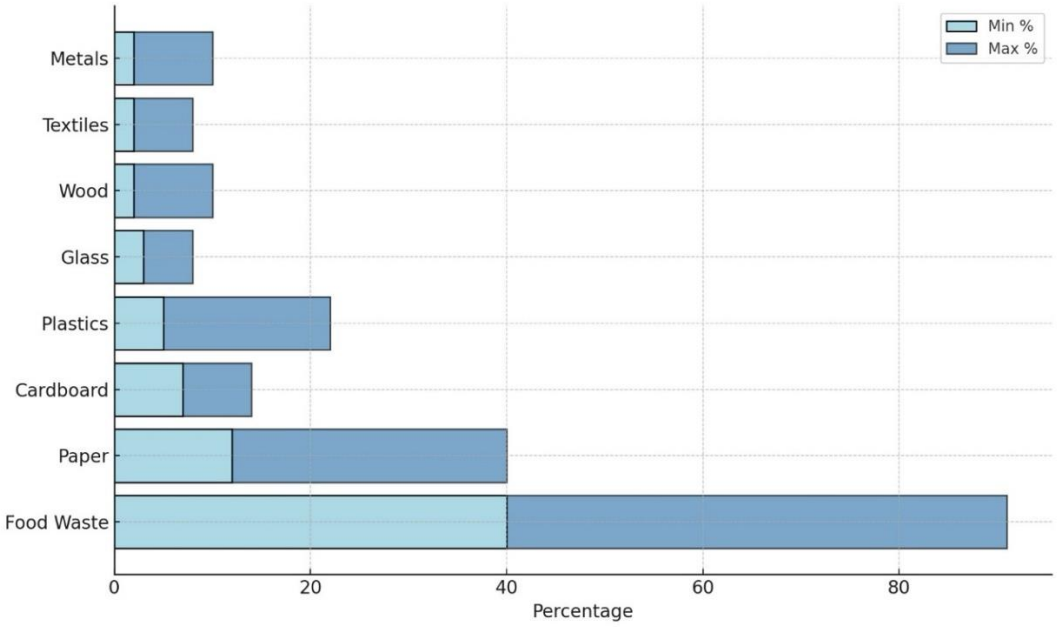


Figure 4. District-Wise Residential Composition of Municipal Solid Waste in Saudi Arabia
Source: Nizami, 2024

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

This paper aims to explore and document the innovative pathways Saudi Arabia is adopting to transition towards a circular economy, including technological advancements, policy innovations, and new business models. By performing a SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis, the paper aims to understand the current state and potential future of circular economy practices in Saudi Arabia. Additionally, the paper assesses how Saudi Arabia's circular economy initiatives can influence and foster regional collaboration, policy harmonisation, and shared economic and environmental benefits across the Arab region.

2. Methodology

This study uses a set of tools that explore the circular economy in the Kingdom of Saudi Arabia and its regional impacts. It relies on a literature review, detailed case studies, and expert interviews. The literature review includes data from academic journals, publications, and other relevant documents about the circular economy's concepts and how they are used in Saudi Arabia. It also gathers and analyses the success stories of Saudi Arabian that have successfully implemented the circular economy. Additionally, case studies in Saudi Arabia that have adopted the circular economy approach are included in the research, providing specific examples of the challenges and opportunities associated with adopting circular economy concepts in the nation.

Interviews were conducted with experts in the field of circular economy to gather their perspectives on the implementation and impact of circular economy practices in Saudi Arabia. The interviews help put the findings from the literature review and case studies into context and provide a deeper understanding of the strategic and operational considerations associated with the transition to a circular economy. A SWOT analysis is carried out to pinpoint the strengths, weaknesses, opportunities, and threats related to implementing a circular economy in Saudi Arabia, drawing upon literature reviews and discussions with experts. This analysis seeks to offer a detailed insight into the current expertise in Saudi Arabia. In addition, the international publishing database (Scopus) was relied upon to determine the rates of cooperation between the Kingdom and Arab countries in the field of the circular economy, as well as the Kingdom's ability to attract international cooperation in research and development of circular economy technologies.

3. Innovative Pathways to a Circular Economy in KSA

3.1. Saudi Vision 2030 and its Emphasis on CE

Saudi Vision 2030 is a government program launched by the Kingdom of Saudi Arabia to increase diversification economically, socially and culturally. This plan underscores the reduction in Saudi Arabia's high reliance on oil revenues to establish a more sustainable and resilient economy to meet global challenges and uncertainties. The plan that is Vision 2030 puts sustainability across the board, as well as environmental protection and resource use efficiency for sustainable development. This vision sought to protect natural resources, minimise environmental impacts, and enhance sustainable practices in every sector. Aligned with these aspirations for sustainability, Saudi Vision 2030 sets ambitious targets regarding its renewable energy sources, with an aggressive decrease in carbon emissions. It presents the issue of renewable energy, especially solar and wind power, in the world diversification of energy sources, increasing security of supply, and mitigation of global climate change (Shehri et al., 2022; Altouma et al., 2024).

Within the Vision 2030 program "Achieving Environmental Sustainability," Saudi Arabia aims to establish comprehensive recycling facilities and make waste management more efficient by reducing all types of pollution, including soil pollution from non-degradable waste. A set of goals has been set that the Saudi government seeks to achieve (Table 1), in addition to transforming its economy into a sustainable economy as stipulated in Saudi Vision 2030. (Saudi Vision 2030, 2016).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

Table 1. The Saudi Vision 2030 Themes and Targets toward circular economy and sustainability

Theme	Objectives/Targets
A vibrant Society	- To increase KSA's capacity to welcome Umrah visitors (pilgrims) from 8 million to 30 million annually. - To have three Saudi cities recognised as the top-ranked 100 cities in the world. - To raise our position from 26 to 10 in the Social Capital Index.
A thriving Economy	-To lower the rate of unemployment from 11.6% to 7%. -To increase SME contribution to GDP from 20% to 35%. -To move from our position as the 19th largest economy in the world into the top 15. -To rise from our current position of 25 to the top 10 countries on the Global Competitiveness Index. -To increase foreign direct investment from 3.8% to the international level of 5.7% of GDP. -To increase the private sector's contribution from 40% to 65% of GDP. -To raise the share of non-oil exports in non-oil GDP from 16% to 50%.
An ambitious Nation	-To increase non-oil government revenue from SAR 163 billion to SAR 1 trillion. -To raise our ranking in the Government Effectiveness Index from 80 to 20. -To raise the non-profit sector's contribution to GDP from less than 1% to 5%.

Source: Alshuwaikhat and Mohammed, 2017

The Saudi Vision 2030 goals and objectives are entwined with the circular economy in encouraging sustainability and resource efficiency in different areas. For instance, increasing the capacity for Umrah visitors is in line with encouraging sustainable tourism practices, including waste reduction and efficient resource use. Making Saudi cities featured among the top 100 in the world under smart city initiatives for sustainability and circular economy remains pegged to issues like waste management and recycling. This transfer to enrich social capital by moving up the country's rankings in the Social Capital Index shall require community engagement in sustainability, entrenching a recycling and waste reduction culture.

On the economic theme: The circular economy creates jobs in recycling, repair, and remanufacturing, which reduces unemployment. SMEs remain at the core of developing innovative solutions for sustainable production processes. These circular economy practices improve resource efficiency, thereby reducing costs and increasing the promotion of innovation that helps Saudi Arabia move up the Global Competitiveness Index, which will finally attract FDI. Incentivising private sector involvement, circular economies help industries diversify and reduce dependence on exports related to oil while increasing non-oil GDP. The circular economy generates new revenue streams and allows effective governance and the non-profit sector to participate in economic growth through sustainability projects.

3.2 Recycling and Waste Management Programs

In recent years, the Kingdom of Saudi Arabia (KSA) has shown a growing interest in promoting circular economy practices through various initiatives and projects in the recycling and Waste Management sectors. The Saudi Arabian government has recognised the need to encourage recycling and waste management in transitioning towards a more circular economy. Compared to other countries (Figure 5), Saudi Arabia, according to the 2016 Gulf Cooperation Council (GCC) Plastics Industry Indicators, has a meagre recycling rate. Among the GCC countries, the UAE, Oman, and Kuwait have more promising rates, although much is yet to be accomplished in these countries. Under this category, Qatar is the last. This disparity indicates that many better recycling initiatives and waste management infrastructure are required in Saudi Arabia, as well as in other GCC countries, to achieve what has already been done in European countries (The Economist Intelligence Unit, 2022)

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

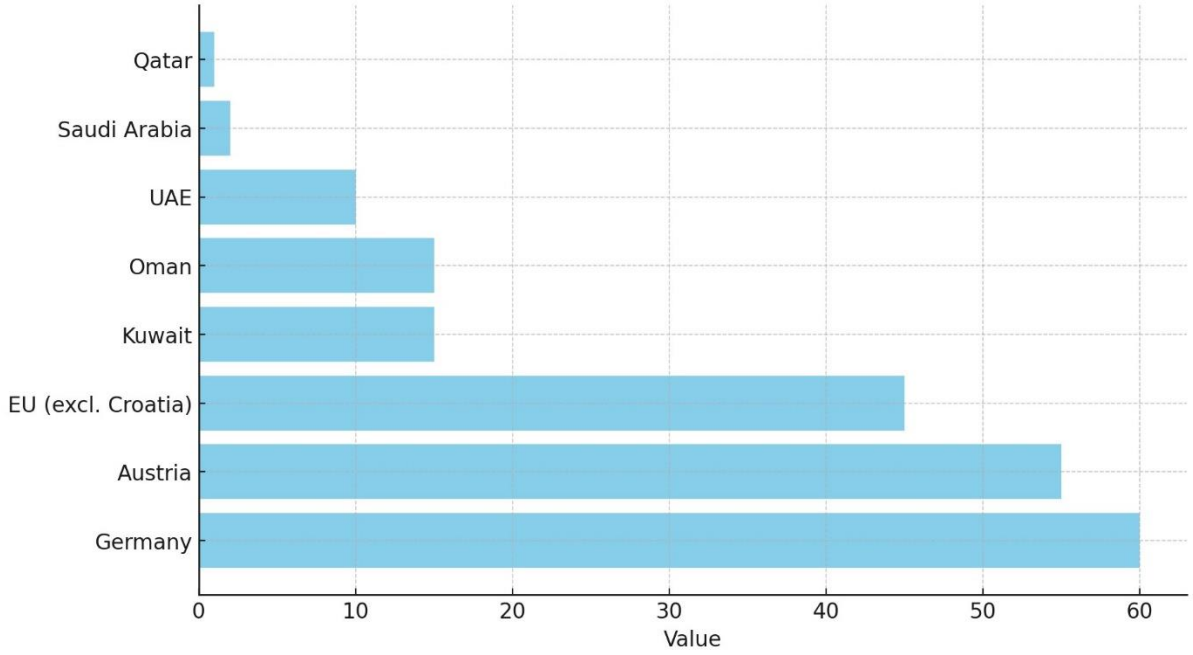


Figure 5. The recycling rate in GCC Plastics Industry Indicators
Source: The Economist Intelligence Unit, 2022

Several initiatives and schemes have been launched to increase recycling rates and waste management and hamper an overflow of landfills. One of the vital recycling initiatives in Saudi Arabia is establishing the National Waste Management Center (NWM), which oversees waste management practices and promotes recycling across Saudi Arabia. The National Center for Waste Management was established in accordance with Council of Ministers order No. 457, date 11/8/1440 AH. They aim to regulate and supervise waste management activities, encourage investment, and expand their quality based on the circular economy principle in waste management to achieve sustainable development goals. The founding pillars of the National Strategy encompass 5 ambitions, 11 strategic objectives, and 19 performance indicators reflected in 65 initiatives setting the foundation for sector transformation (The National Center for Waste Management, 2024).

The Saudi Arabian government has undertaken different regulations and strategies to address waste management challenges, including the management of medical waste (Almubarak et al., 2023), electronic waste (Madkhali et al., 2023), industrial wastewater (Rabeiy et al., 2023), urban air pollution (Alhajj, 2022), and plastic wastes (Almadhi et al., 2023). These initiatives aim to mitigate improper waste disposal practices' adverse environmental and health impacts. These policies all strive to provide an environment that enables the growth of the recycling industry, stimulate investment into its supporting infrastructure, and increase sustainable waste management practices. Furthermore, public-private partnership arrangements have been structured to drive recycling in Saudi Arabia. For example, the Saudi Investment Recycling Company (SIRC) was established to develop and operate recycling facilities, invest in recycling technology, and develop a market for recycled materials. In partnering with the private sector, the government desires to leverage businesses for expertise and access to resources that will help accelerate Saudi Arabia's realisation of a circular economy (SIRC, 2021).

3.3. Water Conservation and Reuse Initiatives in Saudi Arabia

The Kingdom of Saudi Arabia has prioritised the conservation and reuse of water because the region characterises poor water resources and high levels of water scarcity. In establishing initiatives and projects, the country has attempted to avoid avoidable use, develop better management practices, and maximise the reuse of available water resources. These efforts will be most keenly informed by circular economy principles when handling and re-purposing treated wastewater for use in agriculture and industry. Among them, there has been a leading shift towards water recycling and resource recovery from wastewater due to the increasing demand

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

for water and mitigation of environmental impacts. The country has set targets that, by 2025, the entire volume of treated wastewater will be utilised and reused, reaching an increase of 800% in reuse capacities (Dawoud et al., 2022). Agricultural irrigation during 2018, followed by landscape irrigation, represented about two-thirds of treated water reuses; the equivalent industrial water would be 13% of the total water reuse (Figure 6).

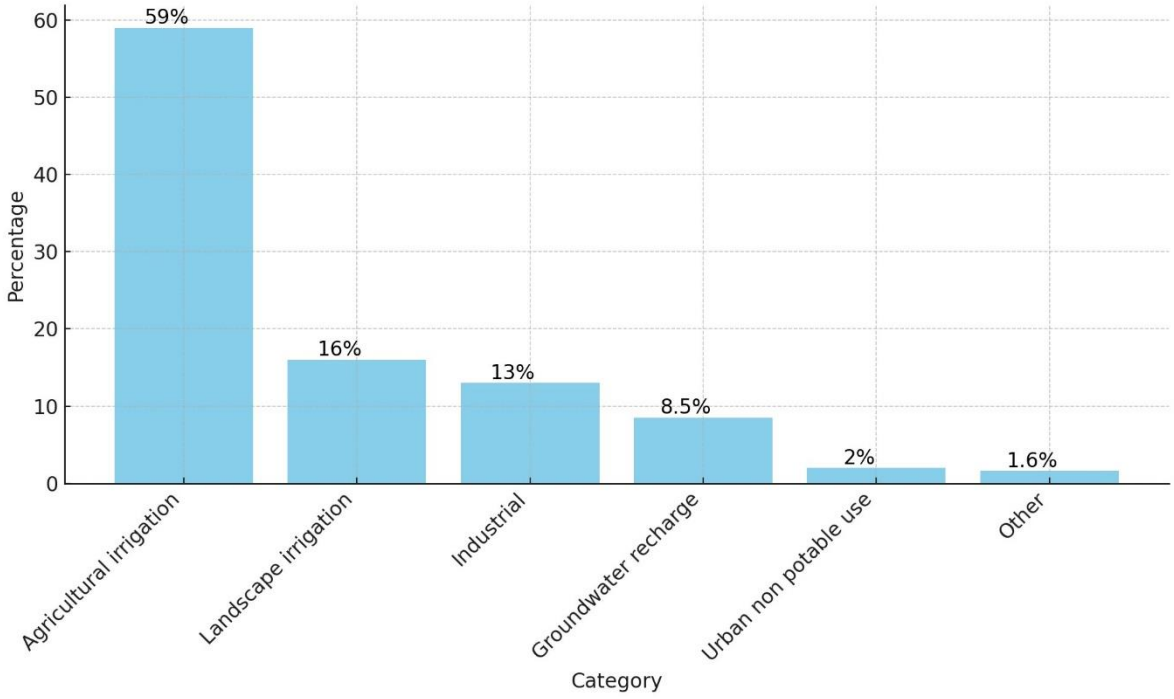


Figure 6. Wastewater Reuse in Saudi Arabia For 2018
Source: Dawoud et al., 2022

Transforming wastewater treatment plants into resource recovery factories is underway; such efforts will support climate neutrality and decarbonisation by way of integrating the production of reusable energy, water, and resources from the same factories (Ali et al., 2022). Besides, produced water from oil operations is being reused to save billions of gallons of groundwater annually and reduce the amount from seawater desalination Ahmed et al. (2022).

One of the critical initiatives regarding water conservation and reuse that Saudi Arabia has focused on is the National Water Strategy. Its purpose is to enhance water security, reduce water wastage, and promote practices that bring about sustainable water management. It comprises programs aimed at improving water efficiency in the agricultural, industrial, and urban sectors, besides initiatives to increase the reuse of treated wastewater for non-potable purposes. In the agricultural sector, water conservation and reuse help ensure the sustainability of farming operations while limiting water use. One major trend adopted in Saudi Arabia has been the use of treated wastewater for irrigation purposes, whereby farmers are less dependent on freshwater resources while reducing the impact of water scarcity on agricultural productivity. The Saudi government has also spent money on infrastructure projects that increase the capacity for wastewater treatment and promote the reuse of treated wastewater. For instance, the King Abdullah Initiative for Saudi Agricultural Investment Abroad coordinates agricultural projects in foreign countries rich in water resources and then exports the products back to Saudi Arabia, thereby reducing pressure on domestic water supplies.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

3.4. Role of Research and Development

Research in CE within the Kingdom of Saudi Arabia is critical to making this implementation of sustainability a success and leading to economic and environmental well-being. Recent research has added much value by pointing out the opportunities and challenges in shifting towards the circular economy model, according to Scopus, the Saudi Arabian expert community published 316 publications on circular economy documents within the last two years. This relatively low number gives one specific focus area within Saudi research; what is extremely interesting is the high collaboration involved in publishing those documents.

Figure 7 shows the country's co-authorship network of circular economy research publications involving Saudi Arabian researchers in the last two years. Saudi Arabia is in the middle, and it shows its contribution to collaborative research. The Saudi Arabia node's big size means most publications are done and collaborations. The most prominent countries associated with Saudi Arabia are the USA, China, the United Kingdom, Malaysia, and Egypt. These connections show that there are solid collaborative relations between these nations. The thickness of the lines between Saudi Arabia and these countries reflects how intense these collaborations are.

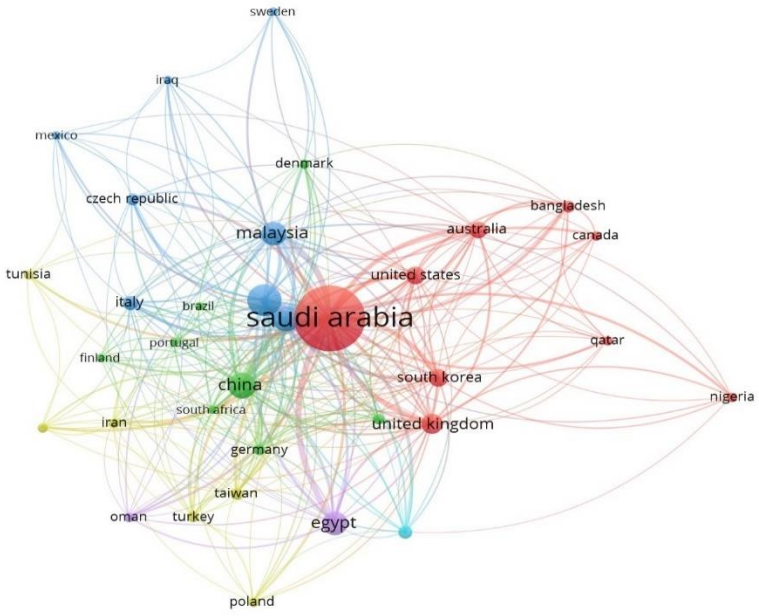


Figure 7. International Co-Authorship Network in Circular Economy Research Involving Saudi Arabian Researchers
Source: Scopus 2024

There is a mix of regional (e.g., Egypt, Iran, Turkey) and global collaboration, such as the United States, the United Kingdom, and Australia, further testifying that a good number of international research collaborations in which Saudi Arabia is actively involved. Other countries, like Malaysia, Italy, and even China, also have sizeable collaborative links with Saudi Arabia, signifying regional initiatives in research or even deeper interests in the circular economy. High rates of international collaboration are often associated with higher-impact research; this could mean anything from contributing ideas to gaining access to different methodologies for spreading the findings further.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

4. Success Stories of Saudi Arabia in the Circular Economy

4.1. Saudi Basic Industries Corporation (SABIC)

SABIC is a major company in the circular economy across Saudi Arabia. It has contributed much towards the circular carbon economy by showcasing new and exciting sustainable ways. It is a founding member of the World Plastics Council, the Alliance to End Plastic Waste, and the World Economic Forum's "Collaborative Innovation for Low-Carbon Technologies in the Chemical Industry" platform. One such notable success was the development of their Trucircle solutions, which include certified circular polymers produced from recycled mixed plastic waste. The project initiative will help reduce the dependency on raw virgin materials. Still, it will also solve the global plastic waste problem by re-processing it into valuable products.

SABIC has implemented a state-of-the-art CO2 capture and utilisation project at their United affiliate in Jubail, Saudi Arabia, and it can capture up to 500,000 metric tons every year. It produces CO2 from its ethylene glycol production. The captured CO2 is further used in the urea and methanol manufacturing process, rather than what otherwise would have been determined as wasted. This project reduces GHG, illustrating a practical application of principles in Circular Carbon (see Figure 8).

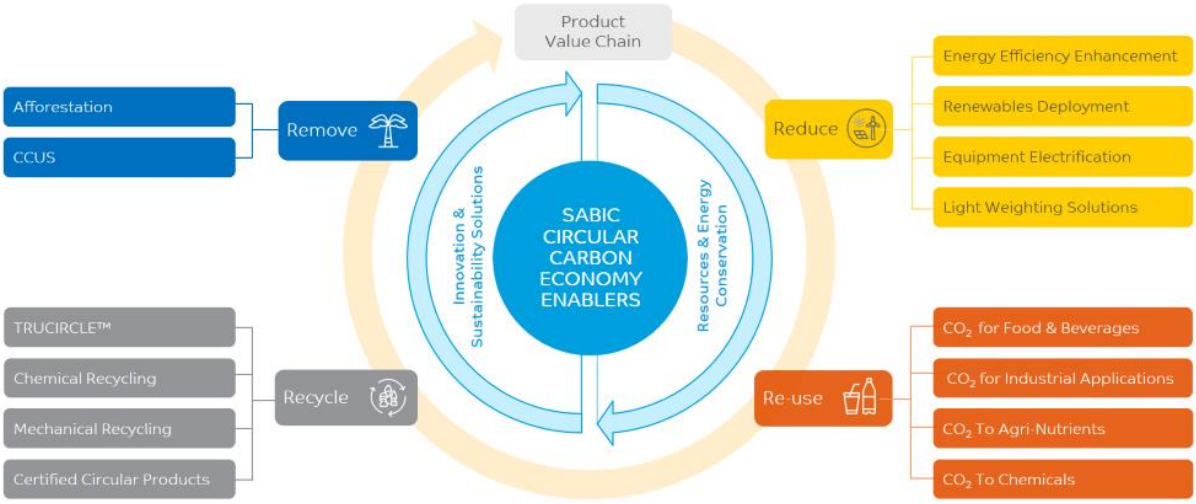


Figure 8. SABIC Circular Carbon Economy Enablers and Strategies
Source: SABIC, 2024

SABIC has invested heavily in advanced recycling technologies, particularly pyrolysis, that can turn hard-to-recycle plastic waste into pyrolysis oil, which will then be turned into feedstock to produce new plastics from waste. The partnership by SABIC with Plastic Energy, a leader in chemical recycling, has been instrumental in scaling this up and making circular solutions more feasible and impactful (SABIC, 2024).

4.2. The Saudi Investment Recycling Company (SIRC)

SIRC is one of the critical drivers for circular economy growth within the Kingdom of Saudi Arabia and aligns with the objectives outlined in Vision 2030. As a Public Investment Fund subsidiary, SIRC aims to transform waste management in the Kingdom. Resource recovery and recycling are encouraged, with a target reduction of landfill waste by 82% over the next 15 years, until 2035. SIRC investments in advanced recycling facilities ensure the processing of several waste streams municipal, industrial, construction, demolition, and electrical/electronic to recover valuable materials and reintroduce them into economic activities. The investments that this company has provided for a capital budget in the execution of its projects amount to 300 million riyals. Modern processing technologies and geographic expansion at new sites in various parts of the Kingdom are involved. This investment is dedicated to improving operational efficiency related to industrial waste treatment processes and creating direct and indirect jobs in diverse fields (SIRC, 2024).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

In this regard, SIRC also runs large-scale public awareness campaigns for citizens' input into the recycling systems. This includes community outreach programs, education partnerships with schools, and media campaigns that raise public awareness about the benefits and benefits associated with recycling. Engaging the public helps SIRC build a culture of sustainability and environment-mindedness necessary for driving circular economy practices toward successful ways. SIRC has many partnerships with local and international organisations to tap into the latest technologies and expertise in the most effective waste management practices. State-of-the-art innovations, such as automated sorting systems, chemical recycling, and waste-to-energy solutions, will also be implemented to ensure efficiency in recycling processes. Such strategic partnerships and technological advancements not only reduce the impact on the environment by conserving resources and reducing pollution but also create economic opportunities in terms of job creation and the stimulation of innovation in green technologies (SIRC, 2024)

.

5. SWOT analysis of the Circular Economy in KSA

For Saudi Arabia, the shift to a circular economy presents distinctive opportunities and challenges since its economy has traditionally significantly relied on natural resources while having ambitious Vision 2030 goals in economic diversification and environmental sustainability. Conducting a SWOT analysis projects the strengths, weaknesses, opportunities, and threats associated with transitioning toward a circular economy in Saudi Arabia, all based on the opinions of experts and literature reviews (Table 2).

Table 2. SWOT analysis of Circular Economy in KSA

Strengths:	**Opportunities:**
• The Saudi Vision 2030 initiative's focus on sustainable development creates an appropriate climate for promoting circular economy practices, In addition to initiatives aimed at sustainable development, especially in areas such as water desalination, waste recycling and agricultural water use. (Almulhim & Al-Saidi, 2023). • Saudi Arabia has significant financial resources to invest in the circular economy. • Harnessing advanced technologies and innovation in developing sustainable operations. • A growing population and consumer market can create the necessary demand for circular products and services. • Saudi Arabia has a strong industrial base that can be transformed into a circular economy. • Saudi Arabia is gradually trying to educate and raise awareness among its people regarding sustainability concerns. • The geographical location makes Saudi Arabia a gateway between Europe, Asia and Africa. This represents better opportunities for trade and cooperation. • Availability of sufficient solar and wind energy resources that support sustainable energy in a circular economy. • Multi-stakeholder partnerships exist to propose solutions and encourage sustainable practices, especially in reducing food and recycling waste (Kopnina & Blewitt, 2018). • The possibility of cooperation between the government agency and the private sector in implementing circular economy projects. • Availability of funds necessary for investment, especially those allocated to the sustainability and green technology sectors. • The existence of strong international cooperation between the Kingdom and developed countries allows for the transfer of technology • The presence of many leading and international companies in economics.	• Circular economy practices can thus help diversify the economy away from oil dependency and towards realising the Kingdom's Vision 2030. • New industries and new jobs in recycling, remanufacturing, and the design of sustainable products. • Positioning of the Kingdom of Saudi Arabia as a leader in sustainable development and circular economy practices, particularly in the Middle East. • Research and development opportunities in sustainable technologies and processes. • The possibility of establishing partnerships with international organisations and countries to promote circular economy initiatives. • Great potential to reduce environmental pollution and carbon footprint. • Developing green financing tools and sustainable investment opportunities. • Promote new business models such as the sharing economy and remanufacturing. • Taking advantage of the circular economy to promote the sustainable tourism sector. • Expanding educational programs to build skills and knowledge in sustainability and circular economy principles. • The possibility of developing and exporting circular products and technologies to other regions. • Opportunities to improve resource efficiency and reduce waste in industrial processes. • Possibilities of establishing cooperation between Arab countries and Saudi Arabia

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

Weaknesses:	**Threats:**
• Inappropriate waste management infrastructure, recycling systems, and lack of supporting and incentivising policies within the current legal framework. • Traditional consumption patterns and lack of public awareness of the benefits of implementing an economy in a circular flow. • Strong dependence of the economy on oil will act as a barrier to change towards a Circular Economy. • Lack of skilled and experienced professionals within sustainability and circular economy. • Circular economy systems and technologies require huge investments at the beginning. • Lack of data collection and metrics for measuring progress and impacts of circular economy initiatives. • The intensity of waste management practices varies across different regions of the country. • Low citizen involvement in recycling and in participating in sustainable consumption practices. • Businesses, smal- and medium-sized enterprises (SMEs), often need help making the significant investments CE requires, both in the initial launch and the continued financial support for its implementation (Rizos et al., 2016).	• Funding and priorities may change with fluctuations in world oil prices and economic instability. • Other countries embracing the implementation of the theory of a circular economy will very quickly overtake KSA • • The pace of technology changes could be faster than the capacities and resources available. • Willful opposition to new practices 'from industries and consumers • Slow development or adoption of enabling policy and regulatory frameworks • Climate change and environmental degradation could pose problems when implementing a circular economy. • Regional geopolitical tensions that can affect annual economic stability and circular economy initiatives • Over-reliance on imported technologies could open up possible supply chain disruption risks. • Changes in global economic conditions that may hinder funding and investment in circular economy projects • Potential for exacerbating social inequalities if the benefits from the circular economy are not evenly distributed.

Source: Authors

6. Spillover Effects of Saudi Arabia's Circular Economy on the Arab Region

6.1 Economic Spillovers

Economic policies and growth in Saudi Arabia truly influence the GCC. Economic initiatives that flow directly from Saudi Arabia, for instance, as is evident with Vision 2030, have the potential to cascade through and promote further economic integration, making the different countries of the GCC more resilient to any global economic shocks. Some of these initiatives also significantly impact regional market integration, which aims to diversify its economy away from oil. This diversification can reduce the region's collective economic vulnerability to oil price shocks and promote more flexible economic structures (Al-Mawali, 2015).

Economic policies and market conditions in Saudi Arabia directly impact the financial markets in neighbouring countries. Studies have shown significant impacts on returns and volatility from Saudi Arabia to other GCC markets such as Bahrain, Oman, Kuwait, Qatar and the UAE. These indirect effects prove the extent of the entanglement of economies in this zone and how much Saudi economic stability influences regional market performance. (Alotaibi & Mishra, 2015). Saudi Arabia's focus on economic diversification and sustainable practices within the framework of the circular economy model can boost trade and investment among countries in the region. Saudi Arabia can create positive new market opportunities through, for example, sustainable business practices and carbon reduction in sectors—for instance, renewable energy, waste management, and recycling—that attract investments from neighbouring countries. The circular economy in Saudi Arabia would also significantly decrease the country's reliance on oil and foster more sustainable economic practices that can, in turn, influence policy developments that neighbours might consider, thus enhancing the general regional shift towards sustainability and economic diversification. (Bahgat, 2016); see Figure 9 below.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

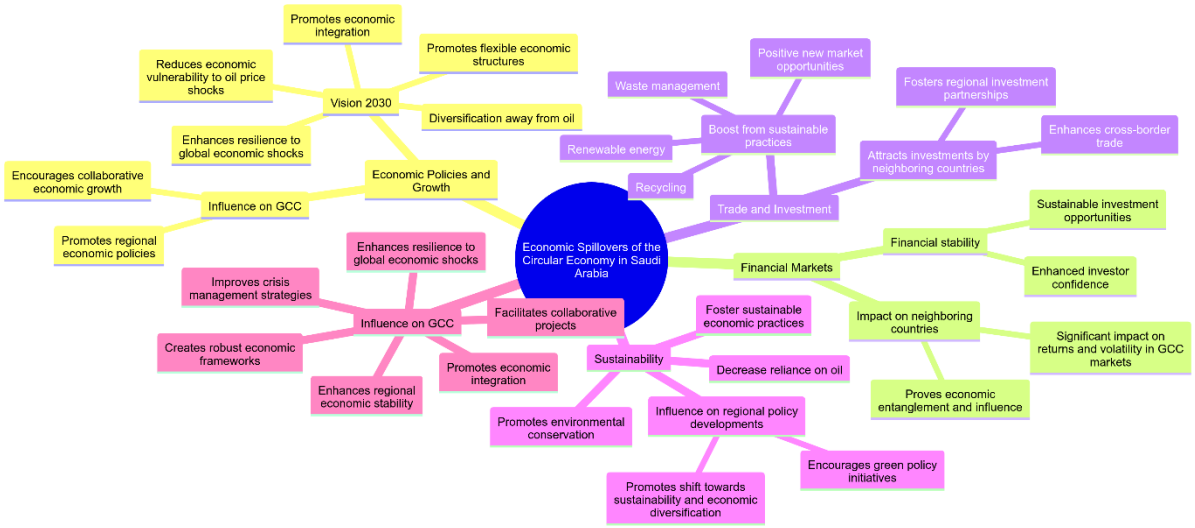


Figure 9. Economic Spillover Effects of Saudi Arabia's Circular Economy on the Arab Region
Source: Authors

6.2. Research and Development Partnerships

R&D partnerships in Saudi Arabia's circular economy are pressing to drive innovation and sustainability. One good example of such a partnership is the cooperation between Saudi Arabia and China in terms of BRI and Saudi Vision 2030. These two initiatives have greatly improved collaboration in trade, investment, power, and the newest technology development, especially by creating pre-conditions that facilitate the execution of the circular carbon economy. (Chen, 2021). Moreover, the Technology Innovation Centers, hosted at King Abdulaziz City for Science and Technology in Saudi Arabia, move toward bridging the unwarranted wide gap between research universities and private industries. It is also an example of a model bringing together academic and industrial resources to solve problems directed at sectors with the view of progressing national technological and economic objectives, moving Agenda 2030 in the circular economy forward. (Khorsheed & Al-Fawzan, 2014).

Further, among the most significant aspects of Saudi Arabia's advancement of the circular carbon economy is its numerous research collaborations. The King Abdullah Petroleum Studies and Research Center signed up to coordinate various events with the King Abdullah University of Science and Technology to track the progress and the implementation plans for the CCE. Additionally, the events will pinpoint the contribution of research in providing ways and means for the development of the public and private sectors and the execution of circular economy initiatives). Furthermore, that reality is crucial for Saudi Arabia's development strategy, as in Vision 2030. This is because the success of PPP projects is predicated on procurement transparency, risk-sharing mechanisms, and knowledge management—all needed for achieving the desired outcomes of the infrastructure and general economic development projects. (Jubair & Singh, 2022).

For Saudi Arabia, most circular economy solutions will be underpinned by new science and technology developments, which can be transferred or replicated across the Arab region. Equally, although some moving-needle solutions have already been identified in key areas, such as circular materials and resource recovery, many of these still need to improve in technological readiness. For instance, biodegradable product packaging could help lessen plastic pollution and support global consumer goods companies in their sustainable pledges. However, significant R&D still needed to be made scalable and cost-efficient. Though many consumer goods companies have excellent in-house research teams, all of them will gain from external collaborations, especially with academia, to complement internal capabilities. This helps translate academic research into applications immediately by developing strategic R&D linkages between private enterprises and leading institutes. Several examples are already in effect: Global consumer goods firms like Procter & Gamble and Nestle are already teaming up with local research institutes like King Abdullah University of Science and Technology. Such

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

partnerships help speed up the development and commercialisation of circular innovations. Knowledge and technology transfer can work both ways and for the benefit of neighbouring Arab countries (see Figure 10).

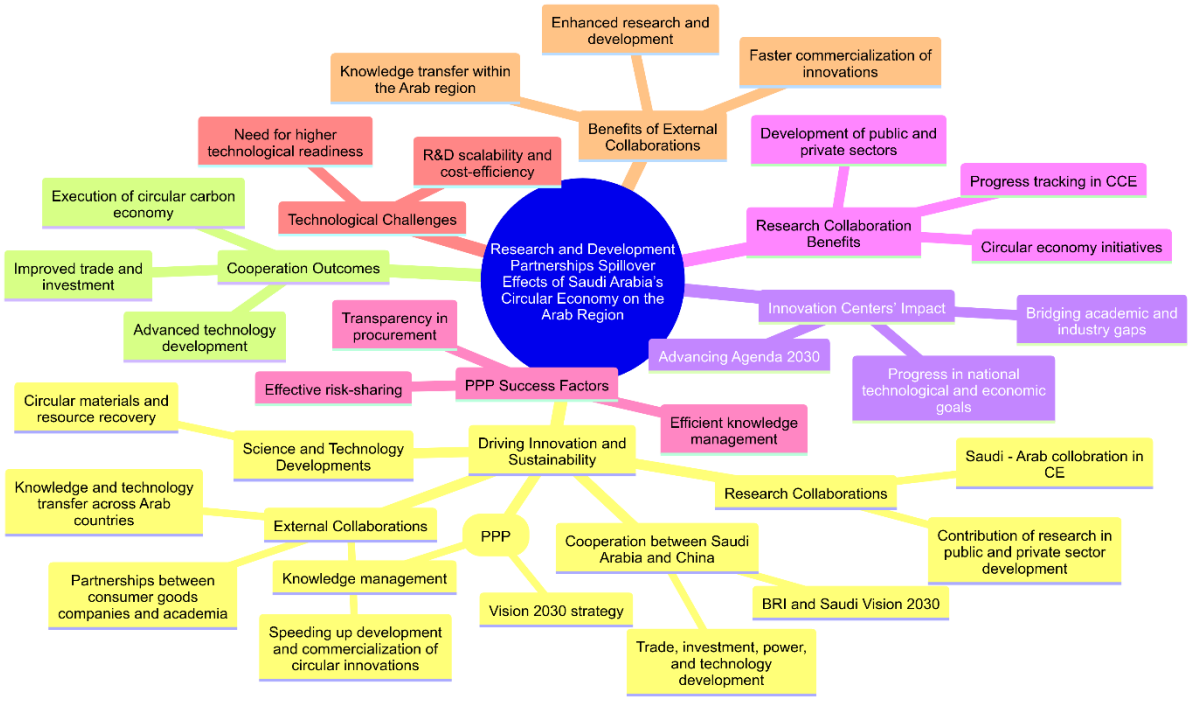


Figure 10. R&D Partnerships Spillover Effects of Saudi Arabia's Circular Economy on the Arab Region
Source: Authors

Conclusion

Therefore, the transition to a circular economy by 2030 shows immense sustainability improvements expected to be brought about by innovative, evident technologies, robust policies, and strategic business models in Saudi Arabia. The country's initiative towards recycling, waste management, and water conservation portrays a severe commitment towards protecting the environment and economic diversification. This transformation offers huge domestic benefits and is believed to have spillover potential across the Arab region, promoting regional collaboration and policy harmonisation. Among these promising drivers should be advanced recycling technologies, waste-to-energy systems, and public-private partnerships—areas in which companies such as SABIC and SIRC have excelled with some of the most successful projects. SWOT analysis reveals strengths in financial resources and technological capabilities and lists challenges such as infrastructure gaps and the need for skilled professionals. Opportunities would include job creation, economic diversification, and regional leadership in sustainability.

The practical value lies in demonstrating how Saudi Arabia can lead CE practices across the Arab region, promoting regional economic integration and environmental sustainability. Specific initiatives, such as waste management improvements, recycling, and water conservation, provide actionable strategies that other countries can adopt. The paper underscores the potential for cross-border trade, attracting investment, and fostering new market opportunities, particularly in the sustainability and renewable energy sectors. By promoting collaborative projects and regional policy harmonisation, Saudi Arabia's CE initiatives are expected to strengthen financial markets, enhance investor confidence, and provide financial stability. The spillover effects include promoting environmental conservation and reducing reliance on oil, thereby encouraging regional green policy initiatives. Technological challenges, the need for higher technological readiness and cost-efficiency in scaling R&D, are highlighted in R&D Spillover. However, benefits like faster commercialisation of innovations and the development of both public and private sectors foster progress in national technological and economic

goals. Saudi Arabia's collaboration with China and regional partners through initiatives like BRI and Vision 2030 significantly contributes to trade, investment, and CE development.

Such efforts from Saudi Arabia could inspire and catalyse similar initiatives across the Arab region for economic resilience and environmental sustainability. Future research should pay attention to detailed case studies, long-term impact assessments, and frameworks for regional cooperation to ensure fruitful implementation of circular economy practices throughout the region. In this way, Saudi Arabia can set an example of the best circular economy practices for other Arab countries to follow in realising regional cooperation toward even more overarching economic resilience and environmental sustainability. Spillovers from Saudi Arabian circular economy leadership will help boost regional integration, stretch the boundaries of sustainable development, and position the Arab region at the helm of global sustainability endeavours. This research offers valuable insights for policymakers, industry stakeholders, and researchers interested in learning more about sustainable development and circular economy strategies in the Arab context. Therefore, there is a need for further research to explore the case studies, additional measures for the long-term impacts of circular economy initiatives, and regionally collaborative frameworks that guarantee the effective uptake and implementation of circular economy practices across the Arab region.

References

Abrosimova, M., Makushev, A., Litvinova, O., Nesterova, N., Gordeeva, L., Semenova, A., & Tolstova, M. (2020). Green economy: preconditions and directions of development in the agricultural sector. IOP Conference Series. *Earth and Environmental Science*, 433(1), 012038. https://doi.org/10.1088/1755-1315/433/1/012038

Abubakar, I. R., & Dano, U. L. (2019). Sustainable urban planning strategies for mitigating climate change in Saudi Arabia. *Environment, Development and Sustainability*, 22(6), 5129-5152. https://doi.org/10.1007/s10668-019-00417-1

Ahmed, S. A., Al-Jeshi, M. A., & Al-Yousef, K. K. (2022). Produced water reuse enabling circularity in oil operations. *Desalination and Water Treatment*, 263, 60-69. https://doi.org/10.5004/dwt.2022.28223

Alhajj, A. T. (2022). Environmental behavior practice in government agencies: Evidence from Kingdom of Saudi Arabia. *Problems & Perspectives in Management*, 20(1), 262-276. https://doi.org/10.21511/ppm.20(1).2022.22

Ali, M., Hong, P. Y., Mishra, H., Vrouwenvelder, J., & Saikaly, P. E. (2022). Adopting the circular model: opportunities and challenges of transforming wastewater treatment plants into resource recovery factories in Saudi Arabia. *Journal of Water Reuse and Desalination*, 12(3), 346-365. https://doi.org/10.2166/wrd.2022.038

Almadhi, A., Abdelhadi, A., & Alyamani, R. (2023). Moving from Linear to Circular Economy in Saudi Arabia: Life-Cycle Assessment on Plastic Waste Management. *Sustainability*, 15(13), 10450. https://doi.org/10.3390/su151310450

Al-Mawali, N. (2015). Intra-Gulf Cooperation Council : Saudi Arabia Effect. *Journal of Economic Integration*, 30(3), 532-552. https://doi.org/10.11130/jei.2015.30.3.532

Almubarak, S. H., Almass, A. A., Dahlawi, S. M., & AlMuhanna, D. S. (2023). Waste management in primary healthcare centers in Saudi Arabia: a policy analysis. *International Journal of Environmental Health Research*, 1-10. https://doi.org/10.1080/09603123.2023.2214508

Almulhim, A. I., & Al-Saidi, M. (2023). Circular economy and the resource nexus: Realignment and progress towards sustainable development in Saudi Arabia. *Environmental Development*, 46, 100851. https://doi.org/10.1016/j.envdev.2023.100851

Alotaibi, A. R., & Mishra, A. V. (2015). Global and regional volatility spillovers to GCC stock markets. *Economic Modelling*, 45, 38-49. https://doi.org/10.1016/j.econmod.2014.10.052

Alshuwaikhat, H. M., & Mohammed, I. (2017). Sustainability Matters in National Development Visions—Evidence from Saudi Arabia's Vision for 2030. *Sustainability*, 9(3), 408. https://doi.org/10.3390/su9030408

Altouma, A., Bashir, B., Ata, B., Ocwa, A., Alsalman, A., Harsányi, E., & Mohammed, S. (2024). An environmental impact assessment of Saudi Arabia's vision 2030 for sustainable urban development: A policy perspective on greenhouse gas emissions. *Environmental and Sustainability Indicators*, 21, 100323. https://doi.org/10.1016/j.indic.2023.100323

Arai, R., Friant, M. C., & Vermeulen, W. J. V. (2023). The Japanese Circular Economy and Sound Material-Cycle Society Policies: Discourse and Policy Analysis. *Circular Economy and Sustainability*, 4(1), 619–650. https://doi.org/10.1007/s43615-023-00298-7

Bahgat, G. (2016). Lower for Longer: Saudi Arabia Adjusts to the New Oil Era. *Middle East Policy*, 23(3), 39-48. https://doi.org/10.1111/mepo.12215

Chen, D. (2021). China's BRI and Saudi Vision 2030. Review to Partnership for Sustainability. https://doi.org/10.30573/ks--2021-dp016

Dawoud, M. A., Ewea, H. A., & Alaswad, S. O. (2022). The future of wastewater treatment and reuse in Kingdom of Saudi Arabia. *Desalination and Water Treatment*, 263, 127-138. https://doi.org/10.5004/dwt.2022.28217

European Commission. (2015). Closing the loop—An EU action plan for the Circular Economy (COM(2015) 614 final). Brussels: European Commission. Retrieved July 4, 2024, from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015DC0614

Halog, A., & Anieke, S. (2021). A Review of Circular Economy Studies in Developed Countries and Its Potential Adoption in Developing Countries. *Circular Economy and Sustainability*, 1(1), 209-230. https://doi.org/10.1007/s43615-021-00017-0

Hamieh, A., Rowaihy, F., Al-Juaied, M., Abo-Khatwa, A. N., Afifi, A. M., & Hoteit, H. (2022). Quantification and analysis of CO2 footprint from industrial facilities in Saudi Arabia. *Energy Conversion and Management*, 16, 100299. https://doi.org/10.1016/j.ecmx.2022.100299

International Monetary Fund (IMF). (2022). World Economic Outlook Database. Retrieved June 30, 2024, from https://www.imf.org/en/Countries/SAU

International Monetary Fund (IMF). (2023). Saudi Arabia's Economy Grows as it Diversifies. Retrieved June 30, 2024, from https://www.imf.org/en/News/Articles/2023/09/28/cf-saudi-arabias-economy-grows-as-it-diversifies

International Trade Administration (ITA). (2024). Saudi Arabia - Waste Management| Trade.gov. Retrieved June 30, 2024, from https://www.trade.gov/country-commercial-guides/saudi-arabia-waste-management

Jubair, S. M. B., & Singh, J. S. K. (2022). Critical Success Factors of Public-private Partnership (PPP) Projects in the Kingdom of Saudi Arabia. *Webology*, 19(1), 1521-1540. https://doi.org/10.14704/web/v19i1/web19102

KAPSARC. (2024). The Circular Carbon Economy Index 2023: Results - KAPSARC. Retrieved July 4, 2024, from https://www.kapsarc.org/research/publications/the-circular-carbon-economy-index-2023-results/

Khorsheed, M. S., & Al-Fawzan, M. A. (2014). Fostering university–industry collaboration in Saudi Arabia through technology innovation centers. *Innovation*, 16(2), 224-237. https://doi.org/10.1080/14479338.2014.11081984

Kopnina, H., & Blewitt, J. (2018). Sustainable Business. In Routledge eBooks. https://doi.org/10.4324/9781315110172

Madkhali, H., Duraib, S., Nguyen, L., Prasad, M., Sharma, M., & Joshi, S. (2023a). A Comprehensive Review on E-Waste Management Strategies and Prediction Methods: A Saudi Arabia Perspective. Knowledge, 3(2), 163-179. https://doi.org/10.3390/knowledge3020012

Madkhali, H., Duraib, S., Nguyen, L., Prasad, M., Sharma, M., & Joshi, S. (2023b). A Comprehensive Review on E-Waste Management Strategies and Prediction Methods: A Saudi Arabia Perspective. *Knowledge*, 3(2), 163-179. https://doi.org/10.3390/knowledge3020012

Mazur-Wierzbicka, E. (2021). Circular economy: advancement of European Union countries. *Environmental Sciences Europe*, 33(1). https://doi.org/10.1186/s12302-021-00549-0

Nizami, A. S. (2024, April 23). Recycling Prospects in Saudi Arabia | EcoMENA. EcoMENA. Retrieved June 30, 2024, from https://www.ecomena.org/recycling-in-saudi-arabia/

Nowicki, P., Ćwiklicki, M., Kafel, P., Niezgoda, J., & Wojnarowska, M. (2023). The circular economy and its benefits for pro-environmental companies. *Business Strategy and the Environment*, 32(7), 4584-4599. https://doi.org/10.1002/bse.3382

Odia, J. O. (2021). Circular Economy and Climate Change in Developing Economies. In Advances in business information systems and analytics book series (pp. 225-238). https://doi.org/10.4018/978-1-7998-6788-3.ch011

Ogunmakinde, N. (2019). A Review of Circular Economy Development Models in China, Germany and Japan. *Recycling*, 4(3), 27. https://doi.org/10.3390/recycling4030027

Rabeiy, R., Almutairi, S., Birima, A., Kassem, L., & Nafady, A. (2023). A Cross-Sectional Study of Knowledge, Practice, and Management of Solid Waste Segregation in Higher Educational Institutes: A Case Study in KSA. *Sustainability*, 15(6), 5516. https://doi.org/10.3390/su15065516

Rezk, M. R., Kapiel, T. Y., Piccinetti, L., Salem, N., Khasawneh, A., Santoro, D., Montagnino, F. M., El-Bary, A. A., Sakr, M. M. 2023. Circular economy in Egypt: an overview of the current landscape and potential for growth. *Insights into Regional Development*, 5(3), 45-57. https://doi.org/10.9770/IRD.2023.5.3(3)

Rizos, V., Behrens, A., Van Der Gaast, W., Hofman, E., Ioannou, A., Kafyeke, T., Flamos, A., Rinaldi, R., Papadelis, S., Hirschnitz-Garbers, M., & Topi, C. (2016). Implementation of Circular Economy Business Models by Small and Medium-Sized Enterprises (SMEs): Barriers and Enablers. *Sustainability*, 8(11), 1212. https://doi.org/10.3390/su8111212

SABIC. (2024). Circular Economy. Retrieved July 3, 2024, from https://www.sabic.com/en/sustainability/circular-economy

Sariatli, F. (2017). Linear Economy Versus Circular Economy: A Comparative and Analyzer Study for Optimization of Economy for Sustainability. *Visegrad Journal on Bioeconomy and Sustainable Development*, 6(1), 31–34. https://doi.org/10.1515/vjbsd-2017-0005

Saudi Vision 2030. (2016). Vision 2030 Pillars. Retrieved June 30, 2024, from https://www.vision2030.gov.sa/en/vision-2030/overview/

Shehri, T. A., Braun, J. F., Howarth, N., Lanza, A., & Luomi, M. (2022). Saudi Arabia's Climate Change Policy and the Circular Carbon Economy Approach. *Climate Policy*, 23(2), 151–167. https://doi.org/10.1080/14693062.2022.2070118

SIRC. (2024). Circular Economy. Retrieved July 3, 2024, from https://sirc.sa/about.html

Smol, M., & Marcinek, P. (2023). Circular economy—the new innovation wave. In Elsevier eBooks (pp. 65–77). https://doi.org/10.1016/b978-0-323-95278-1.00024-3

Sulami, S. A., Sulami, M. A., Nasr, J., & Sharawi, H. (2024). Circular Economy Analysis as a Tool to Enhance Sustainability of Supply Chains in Kingdom Saudi Arabia and a Means to Achieve Saudi Vision 2030. *Modern Economy*, 15(05), 566–586. https://doi.org/10.4236/me.2024.155029

The Economist Intelligence Unit. (2022). In Boosting Circularity Across Saudi Arabia. The Economist Intelligence Unit. Retrieved June 30, 2024, from https://impact.economist.com/perspectives/sites/default/files/08112020_eiu_boosting_circularity_across_saudi_arabia_march_2021.pdf

The National Center for Waste Management. (2024). Retrieved June 30, 2024, from https://mwan.gov.sa/en

Verrips, A., Hoogendoorn, S., Jansema-Hoekstra, K., & Romijn, G. (2019). The Circular Economy of Plastics in the Netherlands. In Education for sustainability (pp. 43-56). https://doi.org/10.1007/978-981-13-9173-6_4

Yusuf, N., & Lytras, M. D. (2023). Competitive Sustainability of Saudi Companies through Digitalization and the Circular Carbon Economy Model: A Bold Contribution to the Vision 2030 Agenda in Saudi Arabia. *Sustainability*, 15(3), 2616. https://doi.org/10.3390/su15032616

Funding. The authors extend their appreciation to Princess Nourah bint Abdulrahman University Researchers Supporting Project number (PNURSP2024R705), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.

Author Contributions: The authors contributed equally. All authors have read and agreed to the published version of the paper.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/r4742847527

Ghada ALTURIF
ORCID ID: https://orcid.org/0000-0003-3997-3523

Wafaa SALEH
ORCID ID: https://orcid.org/0000-0003-4143-7084

Mohamed Ramadan A. REZK
ORCID ID: https://orcid.org/0000-0002-7677-3072

Mohammed Mahgoub HASSAN
ORCID ID: https://orcid.org/0000-0002-5224-2656

Leonardo PICCINETTI
ORCID ID: https://orcid.org/0000-0002-7861-5668

Alaa A EL-BARY
ORCID ID: https://orcid.org/0000-0002-8846-0487

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

Publisher
http://jssidoi.org/esc/home

EVALUATION OF HRM PROCESSES DIGITALISATION BY DIFFERENT GENDERS*

Natália Vraňaková [1]*, Augustín Stareček [2], Zdenka Gyurák Babeľová [3]

[1,2,3] Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava, Ulica Jána Bottu 2781/25, 917 24 Trnava, Slovakia*

E-mails:[1]natalia.vranakova@stuba.sk (Corresponding author); [2]augustin.starecek@stuba.sk; [3] zdenka.babelova@stuba.sk*

Received 14 July 2024; accepted 12 November 2024; published 30 December 2024

Abstract. Digital transformation is currently a topical and researched field. It includes basic processes, which are often closely related to production, and also affects human resource management (HRM) processes. Employee satisfaction is also reflected in the quality of management and the quality of setting up HRM processes. In contrast, the satisfaction itself can be different due to the gender diversity of employees. The article's main aim is to present the results of an analysis of the digital transformation in HRM processes from the perspective of gender diversity of employees in organisations in Slovakia. The current state was analysed through a research questionnaire, which was distributed online and in physical form. The research sample consisted of n = 556 respondents. The research questionnaire provided us with data for the evaluation of research questions and research hypotheses. As part of the research, we set two research questions focused on the differences between men and women in the perception of how their current job affects their future work skills and the employees' approach to developing their digital skills. Through the statistical evaluation of hypotheses, the differences between men and women in the perception of new technologies and the perception of which HRM processes are facilitated by digitalisation were tested. The presented research results can be used to make human resources management more efficient during the digital transformation.

Keywords: digitization; digital transformation; education; gender diversity; human resource management

Reference to this paper should be made as follows: Vraňaková, N., Stareček, A., Babeľová, Z.G. 2024. Evaluation of HRM processes digitalisation by different genders. *Entrepreneurship and Sustainability Issues*, 12(2), 333-347. http://doi.org/10.9770/e3652964232

JEL Classifications: J16, J24 and M15

Additional disciplines: psychology; educology; information and communication; informatics

1. Introduction

In the past three years, the COVID-19 pandemic has significantly accelerated the development of new technologies, driving digital transformation and innovation in business processes. Industrial organisations are now facing the challenges associated with Industry 4.0, which affects work organisation, employee habits, and activities. This article explores the perception of new technologies among employees in Slovakia, focusing on the impact of digital transformation on human resource management and employees' work skills and development opportunities. Additionally, it addresses workforce diversity as a crucial factor in adopting new technologies and managing digitisation. The article is structured into six chapters: an introduction to the research

* *The article is a part of project KEGA No. 010STU-4/2024: „Creation of a laboratory for the systematic knowledge transfer from the research of personnel aspects of human technology interaction into selected subjects of industrial engineering".*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

topic, a theoretical framework on digital transformation and HR processes considering workforce diversity, a description of materials and methods used for analysis, results addressing research questions and hypotheses, a discussion, and a conclusion summarising the findings, research limitations, and future research directions.

2. Literature review and development of hypotheses

The literature review is divided into three areas. The first area is devoted to digitisation as well as digital transformation. The other two parts are devoted to digital transformation and human resource management processes, focusing on employee perception. In the last part, we consider the human factor, focusing on gender diversity, which is critical from the point of view of successful digital transformation.

Digitisation and digital transformation

Academic publications are currently devoted to the issue of developing digitisation as well as the issue of digital transformation. The impact of digitisation and, at the same time, digital transformation on the functioning of organisations is great, and this is also related to the number of publications devoted to various applications, as well as recommended procedures (Venkatraman, 2017; Mahraz et al., 2019), or the management of human resources in organisations with digital tools for individual human resource management (HRM) processes. The change that occurred with the arrival of new information and digital technologies is also called an era characterised by information and communication technologies (Siemens and Connectivism, 2023). The exponential development of new digital technologies and their adoption and use (intentional or unintentional) represents a new form of transformation, which we also call digital transformation (Hanna, 2016). In organisations, this form of organisational transformation (technology-enabled) refers to using information and digital technologies to influence various aspects of the organisation (Morakanyane et al., 2017). Digitisation is a term that has been increasingly used in several areas of life in the last two decades. The term is often used in the context of process innovation, both within organisations and in the public sector. We also frequently come across the term digital transformation. At the same time, it is essential to state that digitisation and digital transformation are closely related; they are not equivalent concepts and cannot be considered synonyms. Researchers believe that digital transformation goes beyond digitalisation because it affects the entire company; on the other hand, digitalisation refers to changes in selected business processes or tasks and activities (Amit & Zott, 2001).

Digitisation generally refers to the use of digital technologies and data to generate revenue, improve business, and transform business processes, and, at the same time, is related to the creation of an environment for business. Globalisation in the last two decades has increased the pressure on organisations (mainly production) to change the usual business models. These changes require organisations to integrate effectively in order not only to stay alive but to thrive in a globally competitive environment. Effective integration and optimal performance (Gyurák Babeľová et al., 2020) can only be achieved through digital processes (White, 2012) and using sustainable management of organisations (Vrabcová & Urbancová, 2023). Digitization also provides productivity improvements, cost reductions and innovations that ""influence"" and affect the success of digital transformation (Strategic Information Management, 2020). The pressure to digitise processes within private and public organisations has increased based on the above.

In the beginning, when the term digital transformation began to be used, this term used to be defined as a process that includes all activities involving adaptation to digital changes within the system used (Hemerling et al., 2018; Young & Rogers, 2019). Digital transformation of organisations requires fundamental organisational change. Some experts say that digital transformation requires instilling a new culture that supports change while being enabled by an overarching corporate strategy (Hemerling et al., 2023). Thanks to technological progress and the integration of digital solutions into existing processes, digital transformation impacts a wide range of areas in the industry. Digital transformation has been introduced in all industry sectors to improve how businesses operate. Not all technologies can be implemented equally or in similar processes; therefore, different industries have adopted the technology to various extents (Kutnjak et al., 2019). For organisations that implement digital transformations, the effects of these transformations are especially beneficial in the areas of innovation (Zhu et al., 2006; Li, 2020), management, and modernisation. Digital transformation also positively

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

affects the competitiveness of organisations in terms of efficiency and cost reduction and affects global value chains in terms of geographic scope as well as specialisation (Leao & Silva, 2021). Examining the impact of digital transformation on different departments within an organisation allows for a deeper understanding of these effects. Managers and decision-makers can thus adopt a focused approach to overcoming the challenges they face. This will provide a better understanding of the differences between departments, including their unique cultures, work processes and resources, which may affect their ability to adopt and implement digital transformation initiatives (Hizam et al., 2023).

Digital transformation and human resource management

Digital transformation profoundly influences all aspects of business management, particularly human resource management (HRM). Organisations must adopt HRM practices that support employee behaviour and align with overall business strategies. The alignment of these practices plays a crucial mediating role in the relationship between strategy implementation and digital transformation (Nicolás-Augustín et al., 2022). Transitioning from traditional HRM methods to digital processes is vital for enhancing organisational productivity and efficiency while reducing resource consumption (Achchab & Temsamani, 2022). Digital HRM processes involve integrating digitisation into various HR functions using modern technologies. While digital transformation presents substantial benefits for business growth, it also brings challenges related to converting old HR systems into new ones and potential negative impacts from these changes (Zhang & Chen, 2023). The HRM function is critical in the digital transformation as it adapts job roles and organisational structures to new standards and operational efficiencies. Digital transformation facilitates the creation of flexible organisational frameworks, enhancing spatial, temporal, and content flexibility for employees (Barisic et al., 2021; Jesek et al., 2021). The changes in digital transformation influence not only HR processes but also how organisations engage with their employees and cultivate workplace culture. Companies increasingly invest in HR processes to harness technological solutions, making digital applications essential for streamlining HR functions (Vardarlier, 2020). Modern organisations leverage digital transformation across almost all HR activities, enabling them to achieve strategic objectives such as improved service quality, cost efficiency, and enhanced HR methods (Zehir et al., 2020). Automation transforms HR management, with many routine tasks now handled by intelligent systems, freeing human resources for more strategic roles (Zehir et al., 2020).

The recruitment and selection process, fundamental to an organisation'sorganisation's sustainable development, is undergoing significant changes due to digital transformation (Nagibina et al., 2020). The increasing use of mobile applications for job access, application tracking, artificial intelligence, and predictive analytics for candidate assessment and employer branding exemplifies this shift (DiRomualdo et al., 2018). Digitisation enhances employee onboarding, improving retention and reducing costs (Suvalova et al., 2021). Digital transformation significantly impacts education, necessitating adaptation to the evolving landscape of digital learning. Emphasis is increasingly placed on social and informal learning through digital media, while formal education is also enhanced by digital technologies (Seufert and Meier, 2016). Rapid advancements in computers and the internet have propelled lifelong learning, allowing employees to acquire transferable and specialised skills and enhancing their adaptability and competitive advantage (Bilyalova et al., 2020; Li, 2022; Sousa and Rocha, 2019). Management must identify vulnerable employee behaviours during digital transformation to facilitate a smooth transition. For instance, performance evaluations can become crucial in this phase, enabling objective assessments of how well employees adapt to new task management approaches (Alieva & Powell, 2023). Digital tools support continuous performance evaluations, allowing managers and employees to share feedback regularly, which promotes self-correction and adaptability to new digital demands (Fu et al., 2023). Digital technologies simplify access to compensation and benefits data, automating payroll processes. These technologies facilitate efficient data collection from various systems, minimising manual steps and enhancing overall efficiency in HR management. Self-service portals enable employees to manage their HR tasks, such as leave requests and personal information updates, increasing transparency and reducing administrative burdens (DiRomualdo et al., 2018). Workforce analytics is essential for HRM, enabling organisations to monitor employee engagement, productivity, and satisfaction in real-time (Burnett & Lisk, 2019). HR analytics integrates new technologies to improve decision-making related to people management, ultimately enhancing individual and organisational performance (Achchab & Temsamani, 2022). Responsible decision-making in HR requires an analytical perspective that considers multiple dimensions of HR management and informs strategic

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

choices (Momin & Mishra, 2023). Data analytics facilitates accurate workforce planning and forecasts regarding employee turnover. Predictive analytics harnesses current data to anticipate future outcomes, assisting organisations in making informed decisions before implementing changes. The increasing emphasis on data analytics within HRM reflects a broader trend toward digitisation, reshaping traditional HR practices (Likhitkar & Verma, 2020).

Digital transformation helps overcome communication, geography, and hierarchy barriers, returning the focus of HR management to individuals. While digital HRM involves automating traditional functions, it also necessitates rethinking these roles through a people-centric lens that prioritises efficiency (Mitrofanova et al., 2019). However, it is critical to maintain a strong foundation of human values during this transition, as the role of people in achieving long-term organisational success remains paramount. Moreover, the digitisation of HRM raises concerns about potential job losses, particularly in roles traditionally held by women. Research indicates that job displacement due to automation is most pronounced in routine tasks, where women are often overrepresented, highlighting that digital transformation is not gender-neutral (Larsson & Viitaoja, 2019; Genz & Schnabel, 2023).

In conclusion, while digital transformation offers numerous advantages for human resource management, organisations must navigate its complexities thoughtfully. This involves strategically integrating digital technologies into HR practices while ensuring that employee engagement, adaptability, and core human values remain central to the process. By doing so, organisations can position themselves for sustainable success in an increasingly digital world.

A human factor in digital transformation

Some authors emphasise that human components in organisations are crucial to digital transformation (Stachová et al., 2020). In the digitisation era, HR processes should be human-oriented and personalised, focusing on appreciation, individualisation, and lasting experiences. Digital transformation poses challenges in human resources, given the extensive changes in standards and procedures. A key challenge lies in adapting to individual employees, necessitating a balance between digital processes and personalisation (Varshney, 2020). Organisations feature diverse workforces, and individual differences can influence the acceptance of new technologies. Investigating the differences in work approaches between men and women is vital, along with promoting equal opportunities (Murray & Southey, 2020). Research indicates that digital inequality and unequal access to technology, especially in regional communities, may lead to different perceptions and adoption of digital technologies between genders (UN Women, 2020; Hsieh et al., 2008). A study revealed significant differences in the impact of gender on technology adoption; businesses led by women tend to use social media more extensively than those led by men. However, women require more assistance with digital strategies, while men are more likely to pursue technical roles and IT skills (Alam et al., 2022).

The digital gender divide is complex, influenced by various aspects such as limited access to digital tools, affordability, lack of skills or education, technological literacy deficiencies, and inherent gender biases. While connectivity issues mainly affect developing regions, these challenges impact women globally. There is no one-size-fits-all solution to digital gender inequality, which restricts women's opportunities in technology professions. Hence, there is an urgent need to provide adults with opportunities to enhance qualifications, particularly for women to develop skills related to digitalisation. The digital era offers flexible solutions to remove barriers to adult learning, but achieving this requires coordination among different institutions and actors (Larsson & Viitaoja, 2019). Given the importance of analysing the gender divides within the context of digital transformation and its impact on business functioning, we aim to contribute to knowledge in this area through our research. Understanding these dynamics is essential for addressing the challenges posed by digital transformation and fostering inclusivity in technology adoption.

RH1: There is no statistically significant difference exists between men and women in the perception of new technologies (digitalisation).
RH2: There is no statistically significant difference between men and women in the perception that digitisation facilitates HRM processes.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

The article's authors created a diagram showing the presented research framework. The representation of the research framework (research problem) can be seen in Figure 1.

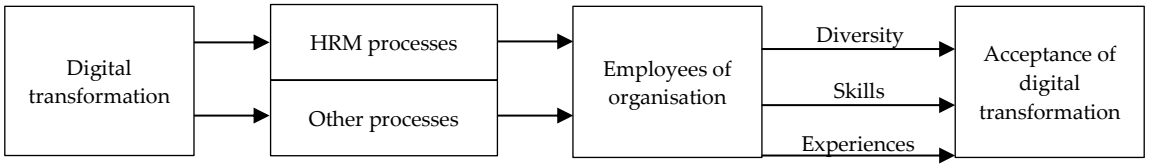


Figure 1. Research framework of digital transformation in human resource management

Source: own elaboration, 2023

In the research framework shown in Figure 1, we focused on the impact of digitalisation and digital transformation on individual HRM processes and the differences between men and women in the perception of digitalisation and its effects. Considering the area of digital transformation and also its possible impact on the functioning of organisations, we focused on how this phenomenon affects organisations in Slovakia. As part of the research focus, we analysed the impact of digitisation and digital transformation on human resource management. Since we perceive a significant lack of studies in this area, we formulated research questions, the answers to which would have practical and theoretical benefits.

3 Materials and methods

The following subchapters outline the research sample characteristics, data collection tool (research questionnaire), and evaluation of research questions and hypotheses. Initially, we examined theoretical knowledge in digitisation and new technologies, focusing on employee skill development while considering employee diversity. We defined the research framework, formulated the research problem, and identified the research object—employees from organisations in Slovakia and their perceptions of technology and digitisation. The formulation of research questions and hypotheses followed this.

The authors created a research questionnaire aligned with the goals of the project VEGA No. 1/0721/20, which focuses on identifying priorities for sustainable human resource management, particularly regarding disadvantaged employees in the context of Industry 4.0. Data collection occurred from April 2021 to December 2022, involving 556 employees from various organisations in Slovakia. The collected data were processed using MS Excel and IBM SPSS Statistics 23. Table 1 presents the characteristics of the employees based on their region and the size of their organisation, detailing both absolute frequencies (AF) and relative frequencies (RF). The evaluated data served as the basis for drawing conclusions from the conducted research.

Table 1. Characteristics of the respondents in terms of size and region of the organisation

Region / Number of employees in the organisation	1 to 9		10 to 49		50 to 249		250 and more		Total	
	AF	RF [%]	AF	RF [%]	AF	RF [%]	AF	RF [%]	AF	RF [%]
Western Slovakia	44	7.91	71	12.77	104	18.71	303	54.50	522	93.88
Central Slovakia	2	0.36	6	1.08	12	2.16	9	1.62	29	5.22
Eastern Slovakia	2	0.36	0	0.00	1	0.18	2	0.36	5	0.90
Total	48	8.63	77	13.85	117	21.04	314	56.47	556	100.00

Source: own elaboration, 2023

The employees participating in the research come from organisations in Slovakia. At the same time, according to the data in Table 1, it is clear that they mostly come from Western Slovakia (93.88%) and have 250 or more employees (54.50%) in the total number of organisations. A total of 5.22% comprised employees from companies based in Central Slovakia, while the largest were organisations with 50 to 249 employees. The smallest sample (0.90%) is employees from organisations based in Eastern Slovakia. This distribution

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

corresponds to the business environment in Slovakia, as most organisations and companies are concentrated in Western Slovakia. The following Figure 2 contains information about the sector and focus of the organisation participating in the research.

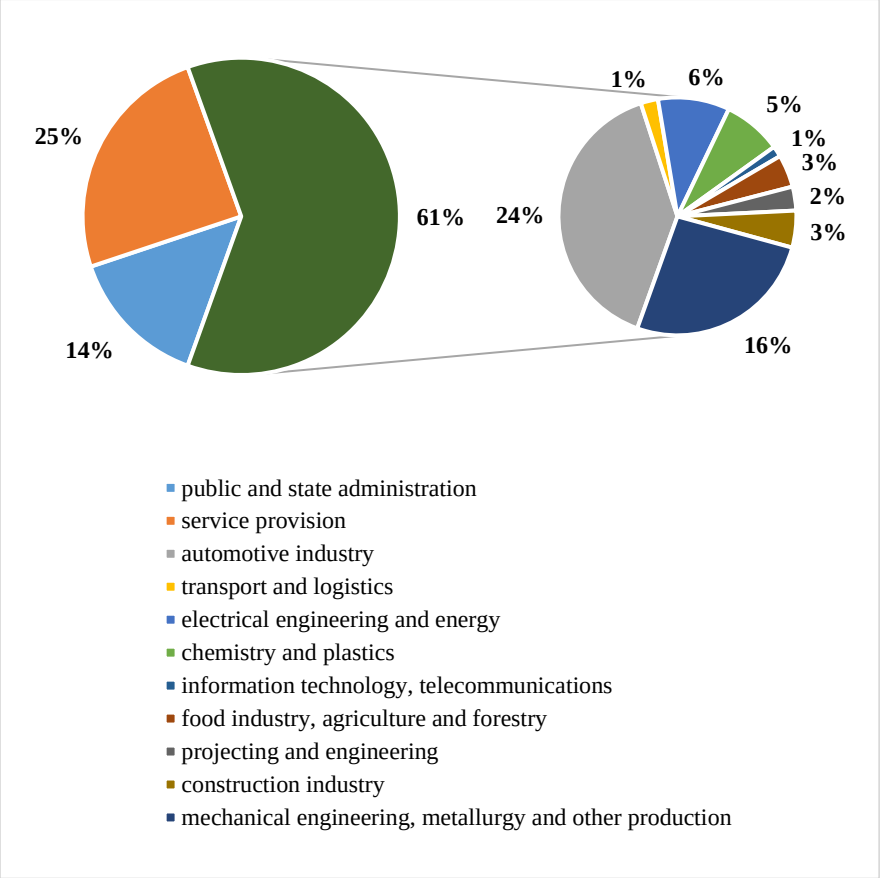


Figure 2. Characteristics of respondents from the point of view of the organisation's sector

Source: own elaboration, 2023

According to the data in Figure 2, 25% of employees come from organisations that provide services, and 14% come from public or state administration. Employees from industrial enterprises make up 61% of the respondents. In comparison, the most significant number are employees from the automotive industry (24% of the total number of organisations), followed by mechanical engineering, metallurgy and other production (16%). This distribution is also responsible for the business environment, as one of the most widespread sectors in Slovakia is the automotive production sector and related enterprises in the field of engineering. The fewest respondents are from companies in the field of transport and logistics and information technology and telecommunications (1% of the total).

In the next part of the article, the respondents - employees of organisations in Slovakia will be characterised in more detail (Table 2).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

Table 2. Demographic distribution of respondents

Demographic distribution of respondents	Man		Woman		Total	
	AF	RF [%]	AF	RF [%]	AF	RF [%]
Job position						
production employee	68	12.23	27	4.86	95	17.09
administrative employee	47	8.45	115	20.68	162	29.14
specialist employee	114	20.50	85	15.29	199	35.79
managerial (management) position	70	12.59	30	5.40	100	17.99
Total	299	53.78	257	46.22	556	100.00
Year of birth						
1951 - 1960	2	0.36	1	0.18	3	0.54
1961 - 1970	22	3.96	20	3.60	42	7.55
1971 - 1980	56	10.07	53	9.53	109	19.60
1981 - 1990	113	20.32	76	13.67	189	33.99
1991 - 2000	103	18.53	106	19.06	209	37.59
2001, 2002	3	0.54	1	0.18	4	0.72
Total	299	53.78	257	46.22	556	100.00

Source: own elaboration, 2023

The data in Table 2 show the respondents' characteristics when 299 men (53.78%) and 257 women (46.22%) participated in the research. In terms of job position and group of men, the most significant part of employees are specialists (20.50% of all men) and the least (8.45% of all men) are administrative employees. Within the group of female respondents, the majority (20.68% of all women) are in administrative positions, followed by women in specialist positions (15.29% of all women). The fewest female respondents are in production positions. In terms of age, the youngest respondent was born in 2002, and the oldest in 1951. Most respondents are men born between 1981 and 1990, while most women were born between 1991 and 2000. Overall, the fewest respondents were born between 1951 and 1960.

4 Results

Two research questions and two hypotheses were established to establish the research framework, which are evaluated in the following subchapter.

Evaluation of research questions

When formulating the research questions, the authors of the article focused on how the current job of employees in the conditions of digitisation and digital transformation affects employees' work skills and what opportunities are offered to employees to improve their digital skills. The intention was to examine the experience of employees and the possibilities of developing their skills as prerequisites for the acceptance of new technologies with regard to the diversity of the workforce. *Evaluation of the first research question: RQ1: How do employees perceive if their current job affects their future work skills?* To evaluate the first research question, the following Table 3 was constructed.

Table 3. Perception of future work skills

Option / Answer	Man		Woman		Total	
	AF	RF [%]	AF	RF [%]	AF	RF [%]
yes, the physical load	40	9.52	20	6.21	60	8.09
yes, the mental load	91	21.67	64	19.88	155	20.89
yes, it allows me to develop skills	114	27.14	99	30.75	213	28.71
yes, it motivates me	77	18.33	49	15.22	126	16.98
yes, it demotivates me	32	7.62	29	9.01	61	8.22
no, it doesn't affect me	66	15.71	61	18.94	127	17.12
Total	420	100.00	322	100.00	742	100.00

Source: own elaboration, 2023

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

The data shown in Table 3 express opinions on how men and women perceive their work abilities with respect to the future. Both men and women agree, to the highest extent 28.17% of the total number of respondents 27.14% of the total number of men and 30.75% of the total number of women) confirmed that their current work allows them to develop their work skills. Percentage-wise, more men, 21.67%, than women, 19.88%, experience psychological stress at work, which may affect their working abilities in the future. In total, the fewest respondents, 8.09%, feel the physical strain at work, specifically 9.52% of respondents from the group of men and 6.21% of respondents from the group of women. The evaluation of the second research question can be seen in Table 4. *RQ2: How do employers ensure the development of their employees' digital skills?*

Table 4. Ensuring the development of digital skills

Option / Answer	man		woman		Total	
	AF	RF [%]	AF	RF [%]	AF	RF [%]
Did not conduct any training	135	30.82	115	33.82	250	32.13
Implemented contact (face-to-face) training	38	8.68	19	5.59	57	7.33
Implemented online (distance) training	122	27.85	92	27.06	214	27.51
Prepared video instructions for using the systems	65	14.84	46	13.53	111	14.27
Prepared manuals and instructions (printed or electronic Word / PDF)	69	15.75	61	17.94	130	16.71
Provided financial resources for the personal development of selected skills	9	2.05	7	2.06	16	2.06
Total	438	100.00	340	100.00	778	100.00

Source: own elaboration, 2023

Respondents had the opportunity to mark several answers from the options listed in Table 4. In the mentioned question, the answers were similar between men and women. Therefore, employers must implement training to the greatest extent to develop digital skills. The second most common answer is online (distance) training, followed by manuals and tutorials. Among the least marked options is providing a financial contribution for developing selected skills and contact (face-to-face) training.

Evaluation of research hypotheses

When formulating research hypotheses, we focused on how the gender diversity of human resources affects the perception of new technologies and areas of human resource management that are facilitated by digitalisation. We processed the established research hypotheses in MS Excel and evaluated them using the chi-square test and the Independent Samples T Test in the IBM SPSS Statistics 23 software.

Evaluation of the first research hypothesis (*RH1): There is a statistically significant difference between men and women in the perception of new technologies (digitalisation).* The hypothesis was tested using the chi-square test, and the strength/measure of correlation was defined by Cramer'sCramer's V. The results of the chi-square test and Cramer'sCramer's V are shown in Table 5, Table 6 and Table 7.

Table 5. Differences between men and women in the perception of new technologies

Option / Answer			As a burden	As a necessity	As work facilitation	I do not observe this in our organisation
Gender	**Man**	**Count**	17	130	122	30
		Expected Count	15.1	112.9	136.1	35.0
	Woman	**Count**	11	80	131	35
		Expected Count	12.9	97.1	116.9	30.0
Total		**Count**	28	210	253	65
		Expected Count	28.0	210.0	253.0	65.0

Source: own elaboration, 2023

Table 6. Chi-square results for testing of hypothesis 1

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

Test of Chi-Square	Value	df	Asymptotic significance (2-sided)
Pearson Chi-Square	10,784[a]	3	0.013
Likelihood Ratio	10.845	3	0.013
Linear-by-Linear Association	8.575	1	0.003
N of Valid Cases	556	-	-

Source: own elaboration, 2023

Table 7. Cramer'sCramer's V for testing of hypothesis 1

Test of Cramer'sCramer's V		Value	Approximate Significance
Nominal by Nominal	**Phi**	0.139	0.013
	Cramer'sCramer's V	0.139	0.013
N of Valid Cases		556	-

Source: own elaboration, 2023

The level of significance proves that it is less than 0.05. Based on the above, we accept the alternative RH1 and thus that there is a difference between men and women in the perception of new technologies (digitalisation). Although the result is statistically significant, the value of Cramer's V is 0.139; thus, the variables are only weakly related (Table 5, Table 6 and Table 7).

Evaluation of the second research hypothesis (*RH2): There is a statistically significant difference between men and women in the perception of which HRM processes are facilitated by digitisation.* Table 8 shows the results for men (M) and women (W) respondents.

Table 8. HRM processes facilitated by the use of technology

Option / Answer	0 – I do not know		1 – The best		2		3		4		5 – The worst		Average	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Recruitment and selection of employees	58	40	71	66	77	59	51	46	24	30	18	16	1.89	2.03
Orientation and adaptation of employees	56	26	40	41	78	79	77	65	39	35	9	11	2.10	2.29
Employee education and development	35	15	72	78	90	79	59	57	35	16	8	12	2.04	2.07
Health protection and hygiene measures	65	36	58	63	66	58	68	68	28	20	14	12	1.93	2.04
Assigning and changing work tasks	49	29	49	49	97	82	79	74	14	19	11	4	1.98	2.07
Change of place of work	72	52	50	43	67	59	70	71	26	22	14	10	1.90	1.99
Communication and employee awareness	32	17	85	97	83	60	53	52	28	17	18	14	2.05	1.99
Presence at the workplace (e.g. home office)	67	39	71	78	56	45	66	61	28	16	11	18	1.83	1.96
Assessment and control of work tasks	42	32	53	45	84	59	81	99	29	17	10	5	2.11	2.15
Rewarding of employees	71	57	33	31	60	49	72	76	41	24	22	20	2.15	2.15
Release (dismissal)	100	88	31	25	32	23	74	72	36	23	26	26	1.98	1.98

Source: own elaboration, 2023

Respondents in the HRM processes rated the impact of technology on various areas from "1 - best" to "5 - worst," with an option for "0 - I don't know" as shown in Table 8. We analysed the responses by gender, calculating averages based on the number of answers multiplied by their respective values (0 to 5) and divided by the number of respondents in each gender group. The key finding is that respondents view technology positively regarding its impact on employee management. Both men and women agreed that technology enhances workplace presence (e.g., through remote work), facilitating alternative work modes. Men rated technology's impact on recruitment and selection as highly positive, while women considered employees' release (dismissal) as the second most positively impacted area.

Conversely, women rated the orientation and adaptation of employees, assessment and control of work tasks, and employee remuneration as the least positively influenced areas. Men also rated these three areas as the least positive, although in a different order. Overall, this study highlights varying perceptions of technology's impact

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

on HRM processes based on gender. As part of the second research hypothesis, we used the Independent Samples T Test, and the results are shown in the table attached to the article. In our case, we do not reject RH2, as the significance value is greater than 0.05. There is no difference between men and women in the perception that digitisation facilitates HRM processes.

5 Discussion

Digital transformation within organisations requires investing in opportunities and creating strategies that leverage the existing workforce across departments. For this transformation to succeed, employees must understand its goals, rationale, and implications for their work. Clear communication about the advantages and disadvantages for individual employees is essential. Generally, the more actively employees participate, the better the digital transformation outcomes, as these efforts correlate with organisational performance (Ullrich et al., 2023). Digital transformation often sees employees outside IT departments managing technologically demanding projects, underscoring the need for digital skills among all staff (Yeow et al., 2018). However, the importance of employees'employees' roles and digital skills in this process needs to be addressed. Digital literacy is crucial for employees' cognitive behaviour when using digital technologies, as findings indicate that this knowledge fundamentally impacts their use of digital tools. Aligning employee capabilities with digital technologies can enhance resource utilisation and support digital transformation initiatives (Cetindamar Kozanoglu & Abedin, 2021). An integrated approach to digital transformation involves a symbiotic relationship between influencing factors, digital competencies, and information technology. Adopting digital technologies and innovative business models shapes the direction of organisational culture transformation (Trushkina et al., 2023). As organisations evolve digitally, changes in structure and culture lead employees to adopt roles beyond their traditional functions (Vial, 2019). Employers must prioritise employee well-being during this transformation. Workplace resilience and adaptability significantly influence digital transformation outcomes for individuals and organisations. The rise of advanced technologies is accompanied by a growing skills shortage in the labour market, where retraining and upskilling employees emerge as critical challenges for organisations and governments alike (Trenerry et al., 2021). The demand for digitally skilled employees is increasing in industries, prompting educational institutions to adapt their programs accordingly. A new, flexible educational framework is essential and adaptable to various circumstances and levels of education (Kuhn & Lucke, 2021).

Research should focus on the digitised lives of young people, shaping education in higher institutions while also addressing foundational education to equip future generations with the necessary skills and interests in the digital field (Iivari et al., 2020). Social skills, higher education, and advanced digital literacy may provide a competitive advantage in the job market (Larsson & Viitaoja, 2019). For proactive skill development among current employees, they must view technological advancements as controllable opportunities rather than threats—employees' perceptions of industry maturity regarding technology management impact how they perceive these changes. Employees may see technological advancements as threats when industry maturity is viewed negatively. To foster skills development, managers should encourage open communication about the effects of macro-level trends like digitalisation on their organisations (Ostmeier & Strobel, 2022). Digitisation directly impacts employees, making their involvement in the process essential while also considering their concerns. Misunderstandings regarding specific digital tools can lead to frustration and dissatisfaction among staff (Bueechl et al., 2021). Therefore, monitoring and enhancing the digital employee experience is crucial for successful digital transformation, contributing to productivity, employee satisfaction, and talent retention (Gheidar & Zanjani, 2023).

Successful implementation of new ideas relies on employees having rewarding learning experiences. Human resources play a strategic role in digitisation, as their activities promote employee engagement (Varshney, 2020). Additionally, attention should be given to gender differences. The European Parliament's resolution highlights persistent gender inequalities in the digital sector, with Eurostat data revealing that girls and women are underrepresented in ICT studies within the EU. Gender stereotypes significantly affect subject choice, resulting in fewer adolescent girls interested in ICT careers. Despite an increase in women in cybersecurity, their numbers remain low, necessitating a commitment to gender equality in digital education across all levels (2019/2168(INI), 2023). Both educational institutions and employers must actively participate in developing

digital skills and promoting gender equality in the workforce, particularly in contexts of job transformation (Yalina, 2019).

6 Conclusions

The article successfully analyses the perception of digital transformation in human resource management among employees in Slovak organisations. It reveals gender differences in how new technologies (digitalisation) are perceived. Based on the evaluation of RH1, there is a difference between men and women in the perception of new technologies (digitalisation). This finding highlights the importance of considering gender diversity and the varying starting conditions of current and future employees when developing digital skills. Addressing these differences is crucial for creating effective development opportunities in digital literacy, which are critical to the success of organisations in digital transformation. This should be applied not only in employee training but also in secondary and higher education institutions to enhance digital skills from an early stage. It is positive that, based on the RH2 evaluation, the perception of HRM areas affected by digital transformation does not differ between men and women. Organisations should focus on comprehensively developing and digitising HRM processes, as they are crucial for overall digital transformation. It's essential that employees feel their skills and current roles are protected from future changes, so organisations must prioritise HRM development. Overall, the above findings suggest the need to focus more on factors that may be more relevant than gender in digitisation initiatives. Practice recommendations include taking into account individual preferences and the level of technical skills or motivation of individuals, which can contribute to higher efficiency and acceptance of digital transformation in workplaces.

The research has some limitations, such as the sample size being limited to Slovak organisations and the analysis being conducted only from employees' perspectives. Recommendations are also general and tailored to organisations rather than being specific procedures, as these vary by organisation.

Future research explores ways to maintain employees' work abilities, considering gender differences and examining employability in job transformation due to digitisation. Expanding research beyond Slovakia to other EU countries will also provide a broader perspective.

References

Achchab, S., & Temsamani, Y. K. (2020). Use of Artificial Intelligence in Human Resource Management: "Application of Machine Learning Algorithms to an Intelligent Recruitment System." In L. Troiano, A. Vaccaro, R. Tagliaferri, N. Kesswani, I. Díaz Rodriguez, I. Brigui, & D. Parente (Eds.), Advances in Deep Learning, Artificial Intelligence and Robotics (Vol. 249, pp. 203–215). Springer International Publishing. https://doi.org/10.1007/978-3-030-85365-5_20

Alam, K., Ali, M. A., Erdiaw-Kwasie, M. O., Murray, P. A., & Wiesner, R. (2022). Digital Transformation among SMEs: Does Gender Matter? *Sustainability*, 14(1), 535. https://doi.org/10.3390/su14010535

Alieva, J., & Powell, D. J. (2023). The Significance of Employee Behaviours and Soft Management Practices to Avoid Digital Waste during a Digital Transformation. *International Journal of Lean Six Sigma*, 14(1), 1–32. https://doi.org/10.1108/IJLSS-07-2021-0127

Amit, R., & Zott, C. (2001). Value Creation in E-Business. Strategic Management Journal, 22(6–7), 493–520. https://doi.org/10.1002/smj.187

Barišić, A. F., Rybacka Barišić, J., & Miloloža, I. (2021). Digital Transformation: Challenges for Human Resources Management. ENTRENOVA, 7(1), 365–375. https://doi.org/10.54820/GTFN9743

Bilyalova, A. A., Salimova, D. A., & Zelenina, T. I. (2020). Digital Transformation in Education. In T. Antipova (Ed.), Integrated Science in Digital Age (Vol. 78, pp. 265–276). Springer International Publishing. https://doi.org/10.1007/978-3-030-22493-6_24

Burnett, J. R., & Lisk, T. C. (2019). The Future of Employee Engagement: Real-Time Monitoring and Digital Tools for Engaging a Workforce. *International Studies of Management & Organization*, 49(1), 108–119. https://doi.org/10.1080/00208825.2019.1565097

Cetindamar Kozanoglu, D., & Abedin, B. (2021). Understanding the Role of Employees in Digital Transformation: Conceptualisation of Digital Literacy of Employees as a Multi-Dimensional Organizational Affordance. *Journal of Enterprise Information Management*, 34(6), 1649–1672. https://doi.org/10.1108/JEIM-01-2020-0010

DiRomualdo, A., El-Khoury, D., & Girimonte, F. (2018). HR in the Digital Age: How Digital Technology Will Change HR'sHR's Organization Structure, Processes and Roles. *Strategic HR Review*, 17(5), 234–242. https://doi.org/10.1108/SHR-08-2018-0074

European Parliament. (2021). European Parliament resolution of 21 January 2021 on closing the digital gender gap: Women's participation in the digital economy. Retrieved from https://oeil.secure.europarl.europa.eu/oeil/popups/ficheprocedure.do?lang=en&reference=2019/2168(INI) (Accessed 23 October 2023).

Fu, F., Zha, W., & Zhou, Q. (2023). The Impact of Enterprise Digital Capability on Employee Sustainable Performance: From the Perspective of Employee Learning. *Sustainability*, 15(17), 12897. https://doi.org/10.3390/su151712897

Genz, S., & Schnabel, C. (2023). Digitalisation Is Not Gender-Neutral. *Economics Letters*, 230, 111256. https://doi.org/10.1016/j.econlet.2023.111256

Gheidar, Y., & Zanjani, M. S. (2020). Designing a Conceptual Framework for Digital Employee Experience. *Journal of Organizational Change Management*, 78077. https://journals.ut.ac.ir/article_78077_d913e1252bdaee1640e0388fff52755e.pdf

Gyurák Babeľová, Z., Stareček, A., Koltnerová, K., & Cagáňová, D. (2020). Perceived Organisational Performance in Recruiting and Retaining Employees with Respect to Different Generational Groups of Employees and Sustainable Human Resource Management. *Sustainability*, 12(2), 574. https://doi.org/10.3390/su12020574

Hanna, N. (2016). Mastering Digital Transformation: Towards a Smarter Society, Economy, City and Nation. Emerald Group Publication.

Hemerling, J., Kilmann, J., Danoesastro, M., Liza Stutts, L., & Ahern, C. (2018). It's not a digital transformation without a digital culture. Retrieved from https://www.bcg.com/publications/2018/not-digital-transformation-without-digital-culture.aspx (Accessed 14 October 2023)

Hizam, S. M., Akter, H., Sentosa, I., Ahmed, W., Masrek, M. N., & Ali, J. (2023). Predicting Workforce Engagement towards Digital Transformation through a Multi-Analytical Approach. *Sustainability*, 15(8), 6835. https://doi.org/10.3390/su15086835

Iivari, N., Sharma, S., & Ventä-Olkkonen, L. (2020). Digital Transformation of Everyday Life – How COVID-19 Pandemic Transformed the Basic Education of the Young Generation and Why Information Management Research Should Care? *International Journal of Information Management*, 55, 102183. https://doi.org/10.1016/j.ijinfomgt.2020.102183

Jeske, T., Würfels, M., & Lennings, F. (2021). Development of Digitalization in Production Industry – Impact on Productivity, Management and Human Work. Procedia Computer Science, 180, 371–380. https://doi.org/10.1016/j.procs.2021.01.358

Kuhn, C., & Lucke, D. (2021). Supporting the Digital Transformation: A Low-Threshold Approach for Manufacturing Related Higher Education and Employee Training. Procedia CIRP, 104, 647–652. https://doi.org/10.1016/j.procir.2021.11.109

Kutnjak, A., Pihiri, I., & Furjan, M. T. (2019). Digital Transformation Case Studies Across Industries – Literature Review. In 2019 42nd International Convention on Information and Communication Technology, Electronics and Microelectronics (MIPRO) (pp. 1293–1298). IEEE. https://doi.org/10.23919/MIPRO.2019.8756911

Larsson, A., & Viitaoja, Y. (2019). Identifying the Digital Gender Divide. In The Digital Transformation of Labor (pp. 235–253). Routledge. https://doi.org/10.4324/9780429317866-14

Leão, P., & Da Silva, M. M. (2021). Impacts of Digital Transformation on Firms' Competitive Advantages: A Systematic Literature Review. *Strategic Change*, 30(5), 421–441. https://doi.org/10.1002/jsc.2459

Li, F. (2020). The Digital Transformation of Business Models in the Creative Industries: A Holistic Framework and Emerging Trends. *Technovation*, 92–93, 102012. https://doi.org/10.1016/j.technovation.2017.12.004

Li, L. (2022). Reskilling and Upskilling the Future-Ready Workforce for Industry 4.0 and Beyond. Information Systems Frontiers. https://doi.org/10.1007/s10796-022-10308-y

Likhitkar, P., & Verma, P. (2020). HR Value Proposition Using Predictive Analytics: An Overview. In S. Patnaik, A. W. H. Ip, M. Tavana, & V. Jain (Eds.), New Paradigm in Decision Science and Management (Vol. 1005, pp. 165–171). Springer Singapore. https://doi.org/10.1007/978-981-13-9330-3_15

Mahraz, M. I., Benabbou, L., & Berrado, A. (2020). Digital Transformation in Higher Education: A Framework for Organizational Alignment. Procedia Computer Science, 175, 621–628. https://doi.org/10.1016/j.procs.2020.07.090

Michna, A., & Kusa, R. (2020). The Digital Transformation of Business Organizations: An Impact on Employee Skills. *Journal of Organizational Change Management*, 33(7), 1205–1220. https://doi.org/10.1108/JOCM-12-2019-0396

Morakanyane, R., Grace, A. A., & O'Reilly, P. (2017). Conceptualizing Digital Transformation in Business Organizations: A Systematic Review of Literature. Bled eConference, 21. https://doi.org/10.18690/978-961-286-043-1.30

Mosconi, E., Santoro, G., Mazzoleni, A., & Vrontis, D. (2019). Digital Transformation in the Manufacturing Industry: The Role of Dynamic Capabilities. *Journal of Business Research*, 123, 388–400. https://doi.org/10.1016/j.jbusres.2019.08.034

Nahavandi, S. (2019). Industry 5.0—A Human-Centric Solution. *Sustainability*, 11(16), 4371. https://doi.org/10.3390/su11164371

Nambisan, S., Wright, M., & Feldman, M. (2019). The Digital Transformation of Innovation and Entrepreneurship: Progress, Challenges and Key Themes. *Research Policy*, 48(8), 103773. https://doi.org/10.1016/j.respol.2019.03.018

Neumark, D., & Stock, W. A. (2006). The Labor Market Effects of Race and Sex Discrimination Laws. *Industrial & Labor Relations Review*, 61(3), 379–405. https://doi.org/10.1177/001979390606100304

Nicolescu, O., & Nicolescu, L. (2020). Digital Economy: Transformation, Human Resources Management and Skill Development. Springer International Publishing. https://doi.org/10.1007/978-3-030-51078-7

North, K., & Maier, R. (2018). The Digital Transformation of Knowledge Work: A Case Study on Digital Workplace Learning. In J. Boss, J. Kanold, & J. vom Brocke (Eds.), Digital Change (pp. 215–229). Springer. https://doi.org/10.1007/978-3-319-72844-8_13

Oesterreich, T. D., & Teuteberg, F. (2016). Understanding the Implications of Digitization and Automation in the Context of Industry 4.0: A Triangulation Approach and Elements of a Research Agenda for the Construction Industry. *Computers in Industry*, 83, 121–139. https://doi.org/10.1016/j.compind.2016.09.006

Olczyk, M., & Kociszewski, M. (2022). Digital Transformation and Sustainable Development Goals in the Time of COVID-19. *Sustainability*, 14(5), 2714. https://doi.org/10.3390/su14052714

Ostermann, H., Staudinger, R., & Staudinger, P. (2022). Digitisation and Automation: Changes in the Labor Market and Vocational Education. Procedia Computer Science, 192, 4750–4761. https://doi.org/10.1016/j.procs.2022.07.389

Pacheco, J. M., & Garcia, M. E. (2020). The Impact of Digital Transformation on Human Resource Management in Higher Education Institutions. *Journal of Business Research*, 112, 392–398. https://doi.org/10.1016/j.jbusres.2020.03.034

Pan, Y., Ai, X., & Pan, Z. (2021). Digital Leadership: Construct Development and Empirical Validation. *Journal of Business Research*, 122, 146–158. https://doi.org/10.1016/j.jbusres.2020.07.040

Pohl, T., & Knipfer, A. (2018). Digital Competence in Leadership: Challenges for Leadership in a Digital Transformation. In A. L. Cunha & L. P. Morais (Eds.), Handbook of Research on Human Capital and People Management in the Tourism Industry (pp. 44–56). IGI Global. https://doi.org/10.4018/978-1-5225-7859-7.ch003

Prikladnicki, R., & Audy, J. L. N. (2012). The Influence of Technology and Cultural Factors on Agile Global Software Development Teams: Case Studies from the Brazilian Industry. *Journal of Systems and Software*, 85(4), 883–896. https://doi.org/10.1016/j.jss.2011.10.017

Raisch, S., & Krakowski, S. (2021). Artificial Intelligence and Management: The Automation–Augmentation Paradox. *Academy of Management Review*, 46(1), 192–210. https://doi.org/10.5465/amr.2018.0072

Riemer, K., & Johnston, R. B. (2022). The Future of Work in a Digital World: The Influence of Digital Business Models on Organizations and Employees. *Journal of Business Research*, 141, 258–271. https://doi.org/10.1016/j.jbusres.2021.12.011

Rogers, D. L. (2016). The Digital Transformation Playbook: Rethink Your Business for the Digital Age. Columbia University Press.

Schallmo, D., & Williams, C. A. (2018). Digital Transformation Now!: Guiding the Successful Digitalisation of Your Business Model. Springer International Publishing. https://doi.org/10.1007/978-3-319-72844-8

Schweer, D., & Sahl, C. (2017). The Digital Transformation of Industry – The Benefit for Germany. *International Journal of Innovation Management*, 21(6), 1740014. https://doi.org/10.1142/S136391961740014X

Seder, T. J., & Kazemi, M. (2022). Artificial Intelligence and Its Impact on the Labor Market: The Future of Work and Skills. *Futures*, 144, 102478. https://doi.org/10.1016/j.futures.2022.102478

Sheninger, E. (2019). Digital Leadership: Changing Paradigms for Changing Times (2nd ed.). Corwin Press.

Souza, C. F. de, & da Costa, S. E. G. (2019). Digital Transformation for Sustainability: Implementation and Challenges in an Emerging Economy. *Journal of Cleaner Production*, 230, 1098–1107. https://doi.org/10.1016/j.jclepro.2019.05.082

Sousa, M. J., & Rocha, Á. (2019). Leadership Styles and Skills Developed through Game-Based Learning. *Education and Training*, 61(4), 455–467. https://doi.org/10.1108/ET-03-2018-0066

Sun, J., Wu, H., & Wang, L. (2020). Beyond the Big Data Buzz: A Study on the Impact of Digital Transformation on Work Behaviors. *Information Systems Frontiers*, 22(6), 1379–1390. https://doi.org/10.1007/s10796-019-09947-3

Surbhi, S., & Bakshi, R. (2022). Digital Workforce Transformation in the Era of Industry 4.0: Challenges and Strategies. *Journal of Organizational Change Management*, 35(4), 579–599. https://doi.org/10.1108/JOCM-01-2022-0001

Tamm, M., & Zacher, H. (2021). The Digitalization of Work: Opportunities, Challenges, and Solutions from a Psychological Perspective. *International Journal of Environmental Research and Public Health*, 18(12), 6340. https://doi.org/10.3390/ijerph18126340

Teece, D. J., Peteraf, M., & Leih, S. (2016). Dynamic Capabilities and Organisational Agility: Risk, Uncertainty, and Strategy in the Innovation Economy. *California Management Review*, 58(4), 13–35. https://doi.org/10.1525/cmr.2016.58.4.13

Torres, E., Carrero, M., & Moreno, A. (2023). Digitisation and Sustainable HR Practices in the Gig Economy. *Journal of Business Research*, 149, 145–158. https://doi.org/10.1016/j.jbusres.2022.07.030

van Laar, E., van Deursen, A. J., van Dijk, J. A., & de Haan, J. (2020). The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review. *Computers in Human Behavior*, 72, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

van Osch, W., & Avital, M. (2019). Digital Natives and the Digital Workforce: Key Considerations in the Digital Transformation Process. *Journal of Business Research*, 122, 473–480. https://doi.org/10.1016/j.jbusres.2019.08.030

Vuori, V., & Hänninen, M. (2020). Digital Work Transformation: Impact on Work Identity and Employee Well-Being. *Work*, 65(3), 715–726. https://doi.org/10.3233/WOR-203131

Zuboff, S. (2015). Big Other: Surveillance Capitalism and the Prospects of an Information Civilization. *Journal of Information Technology*, 30(1), 75–89. https://doi.org/10.1057/jit.2015.5

Acknowledgement: *The article is a part of project KEGA No. 010STU-4/2024: „Creation of a laboratory for the systematic knowledge transfer from the research of personnel aspects of human technology interaction into selected subjects of industrial engineering".*

Author Contributions: Conceptualisation: *Natália Vraňaková, Augustín Stareček, Zdenka Gyurák Babeľová*; methodology: *Natália Vraňaková*; data analysis: *Natália Vraňaková*, writing-original draft preparation: *Augustín Stareček, Zdenka Gyurák Babeľová*, writing; review and editing: *Zdenka Gyurák Babeľová*; visualisation: *Natália Vraňaková, Augustín Stareček, Zdenka Gyurák Babeľová*. All authors have read and agreed to the published version of the manuscript.

Natália VRAŇAKOVÁ (corresponding author) received the "Philosophiae doctor" degree in Personnel policy in industrial plant from the Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava in 2020 in the field of personnel management focusing on the age management and the generational groups of employees. Currently, she is an Assistant professor at Institute of Industrial Engineering and Management at Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava. Her major is in personal counseling and business economy. Her current and previous research interests are focused on business management and personnel management, especially in human resources management respecting the age and potential of employees (age management) with regard to generational diversity, sustainable human resource management and employee motivation.
ORCID ID: https://orcid.org/0000-0002-9545-8887

Augustín STAREČEK is a researcher at the Institute of Industrial Engineering and Management at the Faculty of Materials Science and Technology in Trnava. His area of expertise is human resource management with a focus on employee motivation and sustainable performance management, and he focuses on process optimisation in the field of logistics and production. His scientific work also deals with issues of the impact of digitisation on the working environment, where he examines the link between automation, human resources and technological development. He has published numerous scientific articles in renowned journals and is actively involved in international research projects focused on digital transformation and Industry 4.0. The dominant areas of his pedagogical scope are the subjects: Operational Analysis, Information and Knowledge Management, Managerial Skills, and Intercultural management.
ORCID ID: https://orcid.org/0000-0003-3652-8969

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e3652964232

Zdenka GYURÁK BABEĽOVÁ is a associate profesor and researcher at the Institute of Industrial Engineering and Management, Faculty of Materials Science and Technology in Trnava, Slovak University of Technology in Slovakia. Her field of research is performance management, human resource management, work organisation, work conditions, ergonomics, staff development, education, training, investments into human resources, enterprises management systems effectiveness, growth and sustainability of enterprise performance. Currently, she works on projects focused on human resource management and company management improvement, age management, human technology interaction, and the impact of Industry 4.0 on human resource management.
ORCID ID: https://orcid.org/0000-0002-9927-3812

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

Publisher
http://jssidoi.org/esc/home

COVID-19 AS A FACTOR INFLUENCING MUNICIPAL BUDGETS: A CASE STUDY OF CZECH CONDITIONS*

Jiří Bečica [1], Roman Vavrek [2], Viera Papcunová [3], Michal Konečný [4]

[1,2] VSB - Technical University of Ostrava, Faculty of Economics, Department of Management, 17. Listopadu 15, Ostrava - Poruba, Czech Republic
[3] Constantine the Philosopher University in Nitra, Faculty of Natural Sciences and Informatics, Institute of Economics and Management, Tr. A. Hlinku 1, Nitra, Slovakia
[4] Institute of Technology and Business in České Budějovice, Faculty of Corporate Strategy, Department of Marketing and Tourism, Okružní 10, České Budějovice, Czech Republic

E-mails:[1] jiri.becica@vsb.cz; [2] roman.vavrek@vsb.cz; [3] vpapcunova@ukf.sk; [4] michal.konecny@mail.vstecb.cz

Received 11 July 2024; accepted 21 November 2024; published 30 December 2024

Abstract. The COVID-19 pandemic has affected all areas of life, both private and public. The municipalities, which had to deal with increased expenses on the one hand and lower incomes on the other, were no exception. The presented research aims to quantify the impact of the COVID-19 pandemic on the budgets of selected cities in the Czech Republic. A total of 29 municipal budgets (municipalities) are evaluated in 2021 in comparison with their previous economies during the period of 2010-2020. 6 indicators are monitored (five of which are income ones) using a wide range of mathematical and statistical methods, e. g. Shapiro-Wilk test, Levene test, Kolmogorov-Smirnov text, and others. Based on the results obtained, there are no significant adverse impacts of the COVID-19 pandemic on the economy within the budget for the year 2021, both within the framework of total income and total expenditure. The research also did not show any fundamental differences in the management of evaluated cities, which, according to the applicable legislation, are divided into a multi-level system of administration, i.e. city districts or city parts, compared to cities with single-level management, i.e. cities with no territorial divisions.

Keywords: COVID-19 pandemic; Czech Republic; Expenditures; municipal budgets; revenues

Reference to this paper should be made as follows: Bečica, J., Vavrek, R., Papcunová, V., Konečný, M. 2024. COVID-19 as a factor influencing municipal budgets: a case study of Czech conditions. *Entrepreneurship and Sustainability Issues*, 12(2), 348-363. http://doi.org/10.9770/m2849939775

JEL Classifications: H61, H76

1. Introduction

Public administration in every democratic state faces a number of problems. One of the most prevalent is the decision on the security and method of financing public goods and services for the population in the entrusted territory. The expenditure side of each public budget is primarily limited by its revenue side. The article is focused on evaluating the impact of the COVID-19 pandemic on the income side of the economy of the 29 largest cities in the Czech Republic, which, except the cities of Třebíč and Česká Lípa, can be characterised as statutory cities. Statutory cities represent a specific type of municipality within the Czech Republic because they

* *This research was supported by the Student Grant Competition of the Faculty of Economics, VSB-Technical University of Ostrava, project registration number SP2023/064 "Public budgets as a basis for the use of multi-criteria methods".*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

can be further subdivided into urban districts or parts based on the Act on Municipalities and their own decisions on the elected bodies within the framework of the internal regulation, the so-called statute. In practice, there is thus the possibility of a two-tier system of management for the given territory, which, according to Finzgar and Oplotnik (2013), should have its financial resources and a positive influence on the efficiency and effectiveness of the management in the given territory, this was already noted as important by Tiebout (1956) or Oates (1972). According to Daňková, Čepelová and Koreňová (2017), limited options when deciding on the use of financial resources are the result of an insufficient or non-existent effective evaluation system. This is also confirmed by Vavrek et al. (2020), who add that if public administration entities want to survive and prosper in a globalised and competitive world, they must change their thinking and aspire to make their management more efficient. Mazllami and Osmani (2014) stated that many endogenous and exogenous factors determine the success of fiscal reforms at the local and central levels. Neubauerová (2003) states that the application of fiscal decentralisation in each country depends on many suppositions, such as the size of the country, the number of levels within the government, and historical, legislative, social or economic aspects.

According to Slavinskaite (2020), fiscal decentralisation is higher in countries with high economic growth than in countries with lower economic growth, which Aristovnik (2012) already stated based on his statistical evaluations. According to Mazllami (2021), experience with transforming economies in Europe, including the Czech Republic, shows that the unavailability of financial resources often leads to inefficiency in providing public services to the population. On the contrary, Cuadrado-Ballesteros, Garcia-Sánchez and Prado-Lorenzo (2013) or Shin (2017) believe that fiscal decentralisation contributes to better development in the provision of public services in the administered territory by enabling the provision of goods and services in a more competitive environment and defacto at lower costs. What is essential for the evaluation is the income from which the affairs of the local governments are financed. According to Rodden (2002), higher dependence of local governments on transfers can worsen the fiscal management of the entire government sector. According to De Mello (2007), transfers can represent an additional expenditure of the central state administration spent on the development of the territory. Governatori and Yim (2012) state that it is ideal to finance a large part of expenses in the territory based on their income, specifically from the funds collected from taxes and fees. Sedmihradská and Bakoš (2016), Tománek (2017), Opera et al. (2022) also agree with this opinion regarding financing within the territory. (2022) or Vartasová and Červená (2023). The following 3 research questions can be formulated from the above:

RQ1: Has the impact of the COVID-19 pandemic manifested itself on the volume of finances managed by the individual cities in the evaluated sample?
RQ2: Is it necessary to assess the impact of the COVID-19 pandemic individually or aggregated?
RQ3: Is it possible to trace the difference in management between territorially divided and non-territorially divided statutory cities in the Czech Republic?

The first aims to evaluate absolute changes in city budgets and considers the time interval with which the given changes can be observed. The second research question is based on the assumption of the uniqueness of each city, its unique conditions in which it operates, and associated with it, the distinctive manifestation of changes in the budget's income structure. The third research question is focused on evaluating the differences between territorially divided and undivided cities in the Czech Republic. By answering these research questions, we assume the fulfilment of the aim of this study, which is to quantify the impact of the COVID-19 pandemic on the budgets of selected cities in the Czech Republic. The fulfilment of this aim is to answer 3 research questions, which should subsequently lead to the development of further and continuous research.

The article is structured as follows: The first section presents the problem (topic) that the article focuses on. The second section deals with the issue of local self-government in the Czech Republic and describes the currently valid legislation, the position of statutory cities and their competencies. The third section describes the methodology of my research. It describes the research sample, monitored indicators, period, and apparatus used for mathematical-statistical methods. The results of the analysis are presented in the fourth section. It is divided into two parts: in the first, the research sample is evaluated as a whole, and in the second, the cities are evaluated separately. The results are summarised and interpreted in the last (fifth) section.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

2. Literature review

As part of the literature review, the legislative anchoring of territorial self-government in the territory of the current Czech Republic is described first and then followed by a short historical journey into creating a specific group of cities that use the designated title of "statutory cities". These are subsequently used for the practical part of the article in accordance with the established aim of the article and according to the methodology described below for evaluation. Finally, the paper describes the specifics of their scope and possible budget and management approaches.

2.1 Legal regulation of municipalities in the Czech Republic

The position and powers of territorial self-government in the Czech Republic are enshrined in Constitutional Act No. 1/1993 Coll., the Constitution of the Czech Republic, specifically in Chapter Seven, which deals with territorial self-government. Article 99 of the Constitution states that the Czech Republic is divided into basic territorial self-governing units, among which we rank municipalities and higher territorial self-governing units, where we rank regions. Act No. 128/2000 Coll mainly governs the functioning of the municipalities in the Czech Republic. Several legal regulations further control municipalities and their management. Amongst the most important ones, it is possible to mention in particular Act No. 250/2000 Coll., budgetary rules of territorial budgets, as well as Act No. 320/2001 Coll., financial control in public administration and on the amendment of specific laws and Act No. 420/2004., the review management of territorial self-governing units and voluntary associations of municipalities. From the point of view of local government revenues directly affect the budgetary determination of taxes (Act No. 243/2000 Coll.).

A basic overview of the economy of each municipality in the Czech Republic is shown by its accounting, which municipalities must keep according to Act No. 563/1991 Coll. on accounting. The primary management tool of each municipality is its budget, which is compiled for the calendar year; each municipality compiles it in a uniform structure according to the valid budget composition. All municipalities in the Czech Republic are public corporations, have their property, act in their name in legal relations, and bear the responsibilities resulting from these relations. The most crucial target of every municipality is to care for its territory's all-round development and its citizens' needs. When performing tasks, municipalities also must protect the public interest. At the same time, the Act on Municipalities in force allows certain municipalities to have their specific status, among which we include mainly statutory cities and also the capital city of Prague, which is governed by a separate law (Act No. 131/2000 Coll. on the capital city of Prague). Kočí (2012) notes that statutory cities in the Czech Republic are also municipalities, so they must fully comply with the rights and obligations arising from the applicable regulations regarding municipalities in the Czech Republic.

2.2 Statutory cities on the territory of the Czech Republic

If we look through history, the legal institute of statutory cities was established after 1848, when a new arrangement was introduced in the territory of the then-known Austria-Hungary based on the newly adopted constitutionality. After 1848, there were gradual changes in the administration, which then passed to the newly established authorities. Statutory cities were a group of municipalities that were determined in the historical lands of Austria-Hungary by a provisional municipal law. In 1850, Prague, Brno, Olomouc and Opava had their legal regulations, the so-called Statutes, which regulated their status and powers separately, in addition to the provisional municipal constitution that applied to other municipalities. However, according to the municipal law of the Reich, it was assumed that other cities could also apply for their status in addition to the already designated statutory cities. The number of statutory towns in the territory increased rapidly, and by 1918, they included Prague, Liberec, Brno, Jihlava, Olomouc, Znojmo, Uherské Hradiště, Kroměříž, Opava and Frýdek. In the years 1923-1924, the cities of Znojmo, Jihlava, Uherské Hradiště, Kroměříž and Frýdek became their own municipalities, and the jurisdiction of the political office was removed from the cities of Liberec and Opava. In 1941, the statutory cities of Pilsen and Ostrava were established.

Exner (2004) states that over time, statutory cities in the territory of the present-day Czech Republic were created and dissolved in various ways until 1949 when the 7 statutory cities operating at that time in the then territory of the Czech Republic, which included Prague, Pilsen, Liberec, Brno, Ostrava, Olomouc and Opava

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

officially ceased to exist. From 1949 to 1967, only the capital, Prague, had a privileged position among cities. In 1969, Brno, Pilsen and Ostrava joined Prague, but the term statutory city was not officially used. The term statutory city was returned to the municipal establishment in 1990 by Act No. 367/1990 Coll., Czech National Council on Municipalities. The first valid Act on Municipalities after 1990 regulated statutory cities in § 3 and stipulated that the cities of České Budějovice, Plzeň, Karlovy Vary, Ústní nad Labem, Liberec, Hradec Králové, Pardubice, Brno, Zlín, Olomouc, Ostrava, Opava and Havířov are cities with a special status. The 1990 law also allowed for the expansion of the number of statutory cities; it stated that a statutory city is also any other city that is designated by the Presidium of the Czech National Council on the proposal of the government or the proposal of such a city, after the government's statement.

According to the currently valid Act No. 128/2000 Coll. on municipalities, statutory cities are regulated in § 4 and are the cities listed in the law. According to Svoboda (2017), a specific feature of statutory cities is the possibility of dividing the city into city districts or city parts, which, presupposes a two-tier system of city administration. However, the division of the city is not their responsibility. In practice, most statutory cities in the Czech Republic are not divided into city districts or parts but can specify their internal conditions in more detail by statute. Koudelka, Průcha and Zwyrtek Hamplová (2019) state that the legislation of the Czech Republic considers statutory cities as cities of particular importance; a municipality cannot acquire the status of a statutory city in any other way than by law, while none of the valid laws of the Czech Republic regulates the exact criteria to which the prerequisites for obtaining the status can be assessed to become a statutory city. In 2000, the number of cities authorised to use the term statutory city expanded to include the cities of Jihlava, Kladno and Most; in 2003, the cities of Karviná, Mladá Boleslav and Teplice. The cities of Děčín, Frýdek-Místek, Chomutov and Přerov joined in 2006 and Jablonec nad Nisou and Prostějov in 2012. The youngest statutory city in the Czech Republic is Třinec, which was included in the list of statutory cities in 2018 and is also the smallest statutory city in 2023, according to the permanent number of residents living in the city. As of January 1, 2023, 26 statutory cities and, in fact, also the capital city of Prague, have a specific status in the Czech Republic in the Act on Municipalities. These are cities with at least 35,000 inhabitants. They are larger than 35,000 per population. Residents of the towns of Třebíč and Česká Lípa, for this very reason, were included in the evaluation below, together with the other statutory cities.

2.3 Scope and management of the statutory cities in the Czech Republic

Průcha (2011) states that the competence of statutory cities is based on the mixed public administration model in the Czech Republic. It is a German model, originally Prussian, then later Austrian, the essence of which lies in the joint exercise of territorial self-government and territorial state administration by territorial self-governing corporations. Provazníková (2015) states that one territorial administrative unit carries out state administration and local self-government of municipalities in the Czech Republic. If self-government bodies carry out state administration, it is a transfer or state administration carried out in a delegated capacity. For the article, the independent competence of the municipalities is vital because exercising this is the purpose of its functioning. According to Kočí (2012) or Koudelka, Průcha and Zwyrtek Hamplová (2019), matters that are in the interest of the municipality and its citizens can be included in the independent jurisdiction of municipalities if the laws are not entrusted to the jurisdiction of other authorities. Hendrych, Kavěna and Pavlík (2014) state that within the scope of independent competence, these are, for example, activities that are associated with one's own budgeting and meeting housing needs, the protection and development of health, transport, communications, with the protection of public order, with upbringing, and education etc. Provazníková (2015) states that the independent jurisdiction of municipalities is defined within the laws by an exemplary enumeration. Almost everything that impacts the territorial unit's economy and is financed from its budget can be included in the separate jurisdiction. Statutory cities are governed by the same laws as other cities or municipalities in the Czech Republic. The territorial budget is created and used on the principle of irreversibility, non-equivalence, and non-voluntariness. The budget, including the entire budget process, is a tool for municipalities to secure and finance municipal policy. Municipalities manage their property, establish organisations, and provide public goods and services for their citizens. Each municipality has its property and financial resources, which it manages independently but follows the laws. Hejduková (2015), Varadzin and Bečica (2016), and Papcunová et al. (2021) state that in their management, municipalities must use the entrusted property to them economically and efficiently.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

3. Research methodology

Public budgets in the Czech Republic operate on the uniformity principle of income and expenditure. To ensure uniformity and clarity within the budget system, the Ministry of Finance of the Czech Republic issues a binding budget composition, which makes it possible to compare individual territorial budgets from different points of view and analyse their income and expenditure over time. Following the above, the article aims to evaluate the impact of the COVID-19 pandemic on 6 variables from a sample of 29 largest cities in the Czech Republic. The primarily monitored criteria are the total income (P1) and total expenditure (V) of the city, which is further divided according to the classification of the budget structure for income, i.e., tax (P1), non-tax (P2), capital (P3) income and received transfers (P4). For the article, the expenditure side of urban management is not further broken down, as the income received in the pursuit of balanced management limits realised expenditures.

3.1 Methodology for the selection of evaluated cities in the Czech Republic

The article evaluates the 29 largest cities in the Czech Republic with more than 35,000 residents (see Appendix 1). The term statutory city is not used in the evaluated sample of cities for the towns of Třebíč and Česká Lípa. Based on separate laws, the capital city of Prague has a specific position. On the basis of the issued statute, statutory cities can be divided into city districts or city parts. Kopecký (2017) states that the city districts and parts of a statutory city, which are divided territorially, must have their boundaries defined. From a legal point of view, the designations "city districts" or "city parts" are comparable, and there is no difference between them. It only depends on the city's municipal council which designations it chooses in terms of territorial division and if it decides to divide the city's territory at all. In the year 2023, only eight cities are territorially divided in the Czech Republic. These are the statutory cities of Brno, Ostrava, Opava, Pilsen, Ústí nad Labem, Pardubice, Liberec and, in fact, the capital city Prague, which has a specific status based on a separate law. The geographical distribution of divided and undivided statutory cities in the territory of the Czech Republic, respectively, and within the individual regions of the Czech Republic is presented in Figure 1.

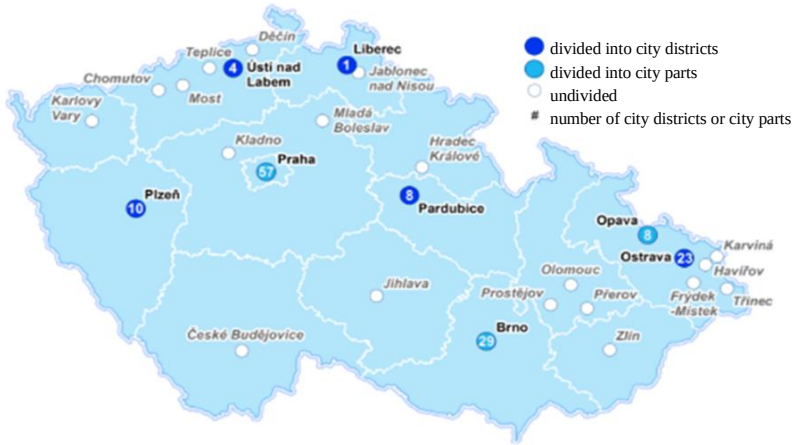


Figure 1. Statutory cities in the Czech Republic by type of internal division, 2023

Source: Ministry of the Interior of the Czech Republic

Figure 1 shows that out of the 27 cities mentioned that can be divided into city districts or city parts, only 8 cities used this option. Svoboda et al. (2017) state that since 1992, no statutory city has decided to divide territorially. The most significant number of statutory cities is located in the Moravian-Silesian Region (Ostrava, Havířov, Opava, Frýdek-Místek, Karviná and Třinec) and the Ústí Region (Ústí nad Labem, Most, Chomutov, Teplice and Děčín). There is more than one statutory city in the region of Middlebohemia region (Kladno and Mladá Boleslav), Liberec region (Liberec and Jablonec nad Nisou) and Olomouc region (Olomouc, Přerov and Prostějov). There is only one statutory city in the remaining eight regions of the Czech Republic, which is the city that is also the seat of the given region (Brno, Zlín, Jihlava, České Budějovice, Plzeň, Karlovy Vary, Pardubice and Hradec Králové).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

The smallest territorially divided statutory city in the Czech Republic, in terms of population and area, is the statutory city of Opava, which has approximately fifty-seven thousand inhabitants and an area of 9,057 ha. From these two points of view, it is indeed the smallest statutory city, but as far as city districts are concerned, it doesn't have the fewest. It can be stated that the number of city districts or city parts does not depend on the size (in terms of the number of permanent residents or the surface area) of the city. The most populous, territorially divided city in the Czech Republic is the capital city, Prague, which is also the largest in terms of area. Olomouc is the most populated, territorially undivided statutory city in the Czech Republic, with more than one hundred thousand inhabitants.

All territorially divided cities have been statutory cities since 1990. Within the evaluated sample of cities, statutory cities that are not territorially organised were supplemented by the towns of Třebíč and Česká Lípa, which have a larger population than the smallest of the statutory cities, which since 2018 is Třinec. Practically speaking, statutory cities in the territory of the Czech Republic adopt a statute only if they decide to divide territorially and at the same time if the representative and executive bodies of city districts or city parts are established (Koudelka, Průcha and Zwyrtek Hamplová, 2019). Territorially undivided statutory cities, which are Kladno, České Budějovice, Karlovy Vary, Jablonec nad Nisou, Hradec Králové, Jihlava, Zlín, Olomouc, Přerov, Chomutov, Děčín, Frýdek-Místek, Havířov, Most, Teplice, Karviná, Mladá Boleslav, Prostějov and Třinec are therefore no different from the towns of Třebíč and Česká Lípa.

3.2 Methodology of period evaluation, evaluated indicators and research questions

Private and public sector organisations were significantly affected by the COVID-19 pandemic in 2020 and 2021, the consequences of which are still visible today in many public budgets, not only within EU countries. An example can be the work of Botta, Caverzasi and Russo (2020) or Cantó et al. (2021), which states that governmental institutions reacted differently to the significant economic situation. Foremny, Sorribas-Navarro and Castelló (2020) or Conte et al. (2020) note that the government levels implemented several measures, most often they involved various forms of financial assistance to vulnerable groups of the population, entrepreneurs and companies through various tax breaks, which had a negative impact on the income side of public budgets.

Heald and Hodges (2020) stated that a consequence of the difference in income and expenditure is increasing indebtedness, which is a result of the struggle with the effects of the pandemic on the private and public sectors. Mura et al. (2014) already stated in their paper that the long-term development trend in public finances can reverse at any time. The COVID-19 pandemic has shown the importance of management, control, and efforts to eliminate the effects of negative impacts on public budgets. The consequences of COVID-19 automatically increased the pressure to increase spending on all government levels and, at the same time, had negative effects on the revenue side of public budgets.

As part of the paper, the incomes of all statutory cities in the Czech Republic and the towns of Třebíč and Česká Lípa are evaluated. Twelve consecutive years within the monitored period of 2010-2021 are evaluated.

In the article, the evaluated cities are ranked in descending order according to the permanent population as of 2021, and these are all cities in the Czech Republic with more than 35,000 inhabitants. The towns of Česká Lípa and Třebíč were included in the analysis for the reason that their number of permanent residents is higher than that of the smallest statutory city in the Czech Republic, which is the city of Třinec. At the same time, the catchment area of all the mentioned cities within the territorial division according to municipalities with extended scope differs from other areas in the Czech Republic in terms of the number of inhabitants by more than 20 thousand from the next largest municipality with extended scope, which is the area of town Tábor. In terms of the population represented, the selected sample of cities makes up 35.8% of the total population of the Czech Republic.

The main monitored criteria represent the city's total income and expenditure, which are further broken down according to the type classification of the budget structure for income into tax, non-tax, capital income and received transfers. The further breakdown of expenses is not used within the article, as it will be the result of another of the articles being prepared. The following budget indicators are evaluated within the article:

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

- total income (P)
- tax revenue (P1)
- capital income (P2)
- non-tax revenues (P3)
- received transfers (P4)
- total expenses (V)

In most cases, we work with absolute total values due to the intention of the article, which is to point out the impact of the COVID-19 pandemic on the amount of financial resources managed by the cities. Each city's budget and realised expenditures are limited by the income they have just received in pursuing a balanced economy.

3.3 Methodology of data processing

The data on the economy of 29 cities in the Czech Republic (see Appendix 1) came from the publicly available database IISSP-Monitor, which is maintained by the Ministry of Finance of the Czech Republic and processed using selected mathematical and statistical methods. In the first step, the data is transformed from absolute values to relative values, year-on-year changes are also expressed using relative values or indices. In the majority of cases, we work with absolute total values due to the intention to show the impact of the COVID-19 pandemic on the amount of financial resources with which the evaluated cities managed during the given years. The budgets of cities and their expenditures are limited by the revenues obtained in the pursuit of a balanced economy.

The distribution function of the obtained data and the results for individual years, or subjects, are evaluated from the point of view of their mutual relationship (correlation), dispersion, mean value and also the already mentioned distribution function, as used, for example, by Bečica et al. (2021), Mokrá et al. (2021), Vavrek, Bečica (2022) or Vavrek (2024a, 2024b). For this purpose, it is gradually used:

- Shapiro – Wilk test

$$SW = \frac{(\sum u_i x_i)^2}{\sum u_i^2 \sum (x_i - \bar{x})^2}$$

where: u_i - constant
x_i - value of the i-th statistical unit
$\bar{x}$ - average value of the variable

- Kendall's coefficient

$$r_K = \frac{n_c - n_d}{n(n-1)/2}$$

where: n - number of observations of a pair of variables
n_c - number of concordant pairs of the pair
n_d - number of discordant pairs of a pair

- Levene test

$$W = \frac{(N-k)}{(k-1)} \frac{\sum_{i=1}^{k} N_i (Z_i - Z_{..})^2}{\sum_{i=1}^{k} \sum_{j=1}^{N_i} (Z_{ij} - Z_{i.})^2}$$

where: k - number of values ot the monitored category
N - number of observations or file range
N_i - number of observations in i-th group
Y_{ij} - measured value of the j-th unit of the i- th group
$\overline{Y_i}$ - average value of the i-th group
$\tilde{Y}_i$ - median of the i-th group
Z - average of groups Z_{ij}
Z_i - average Z_{ij} for i-th group

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

- Kruskal-Wallis test

$$Q = \frac{12}{n(n-1)} \sum_{i=1}^{I} \frac{T_i^2}{n_i} - 3(n+1)$$

where: n - number of observations, or file range
n_i - number of observations in the i-th group
T_i^2 - total number of ranks in the i-th group

- Kolmogorov-Smirnov test

$$D_{n_1,n_2} = \underset{-\infty < x < \infty}{sup} \left| F_{1,n_1}(x) - F_{2,n_2}(x) \right|$$

where: $F_{1,n_1}(x)$ - empirical distribution function of the first sample
$F_{2,n_2}(x)$ - empirical distribution to the second choice

All analyses are processed in MS Office Excel, Statistics 14, and Statgraphics 19.

4 Results

The obtained results and their processing can be divided into two parts. In the first part, we deal with absolute changes in the budgets of the research sample, emphasising changes in 2021; see the first subsection. In the second part, we deal with the results at the level of the individual evaluated cities to verify the results obtained from the first part of the presented research.

4.1 Evaluation of changes for the entire research sample of evaluated cities

From the perspective of the development of the total income of the research sample (Fig. 2), we do not observe changes in the established trend. The graph captures the median with 95% confidence intervals. From the point of view of dispersion, the results for the year 2021 are without statistically significant differences compared to those achieved for the previous 5 years.

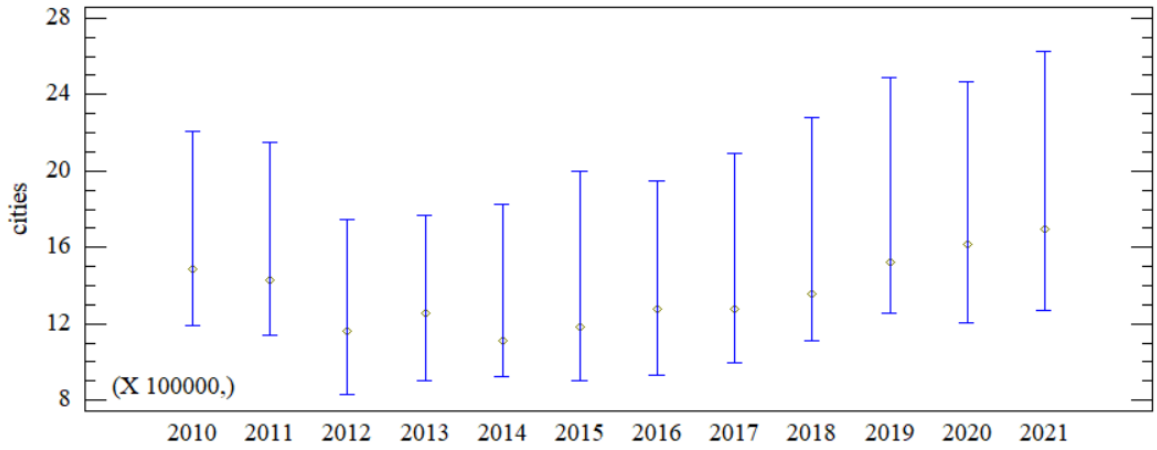


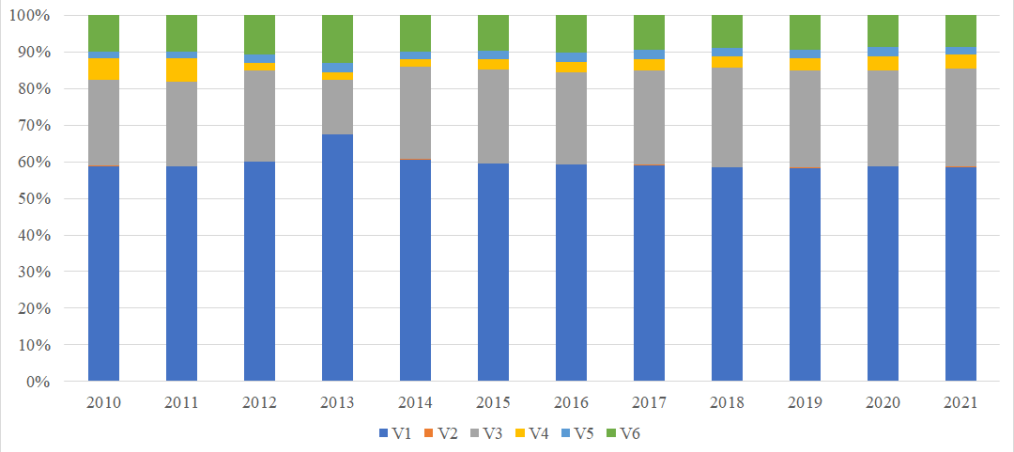
Figure 2. Development of total incomes in the period 2010 – 2021 (absolute values)

Source: Own processing

A similar conclusion can also be made when comparing the mean values, in which case we can state agreement across the entire evaluated period of 12 years. At the same time, the mutual links quantified using correlation analysis (Kendall coefficient) persist. When comparing the absolute total incomes of 29 cities, it is impossible to identify the impact of the COVID-19 pandemic.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

When looking at the total expenditures of the cities in the research sample (Figure 3), we note their identical trend with total incomes. However, this is due to legal regulations and the need for a balanced economy. So, we took a closer look at the structure of these expenditures according to sector breakdown, see legend.



Legend: V1: Services for the population; V2: Agriculture, forestry, and fisheries; V3: Industrial and other sectors of the economy; V4: Social Affairs and Employment Policy; V5: State security and legal protection; V6: General public administration and services

Figure 3. Development of total expenditures in the period 2010 – 2021 (relative values)

Source: Own processing

Group V1: Services for the population have a dominant representation in expenditures, followed by expenditures of group V3: Industrial and other sectors of the economy. The results over time, and especially when compared to 2021, do not show changes that could be clearly attributed to the impact of the COVID-19 pandemic. For this reason, in the next part of the article, we deal with revenues and its classification.

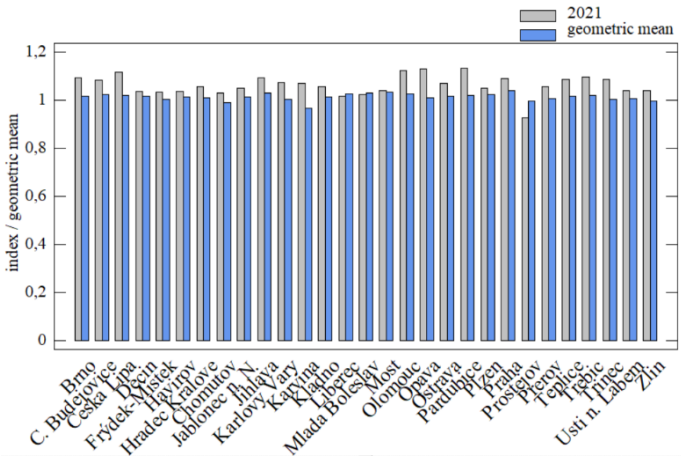


Figure 4. Interannual changes in the development of total incomes in the period 2010 – 2021 – individual cities

Source: Own processing

From the point of view of the individually evaluated cities that are part of the research sample (Fig. 4), the trend when comparing the results in 2021 with the previous period is quite similar. In 26 out of 29 cases, the change in the absolute income of cities in 2021 was higher than the geometric mean for the entire monitored period. The exceptions were Liberec, Mladá Boleslav and Prostějov. The most significant increase in income in 2021 is observed in Pardubice, Opava, Olomouc and Česká Lípa (in all cases an increase of more than 10%). At the same time, these cities belonged to those where the differences in the average change over a period of 12 years

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

and the change in the last year were the highest. Thus, the COVID-19 pandemic did not affect the number of finances managed by the cities of the research sample. Amongst the mentioned cities, there are both territorially divided cities and also territorially undivided ones, i.e., it can be confirmed that the city's division into city districts or city parts does not directly affect the results of its management.

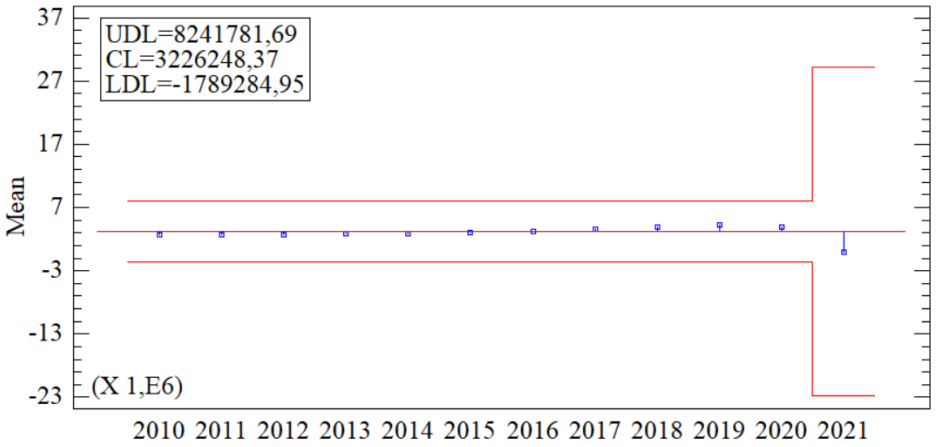


Figure 5. Development of tax incomes in the period 2010 – 2021 (absolute values)

Source: Own processing

What was not demonstrated in the total absolute income of the cities in the research sample can be observed in the case of tax income, for which we observe a lower value in 2021 compared to the 12-year average (see Figure 6). The homoscedasticity of the results was confirmed again, but this time in connection with the differences in mean values. However, it is impossible to determine from these results whether the change is due to the year 2021 or the development trend for the monitored period, which is discussed in the text below.

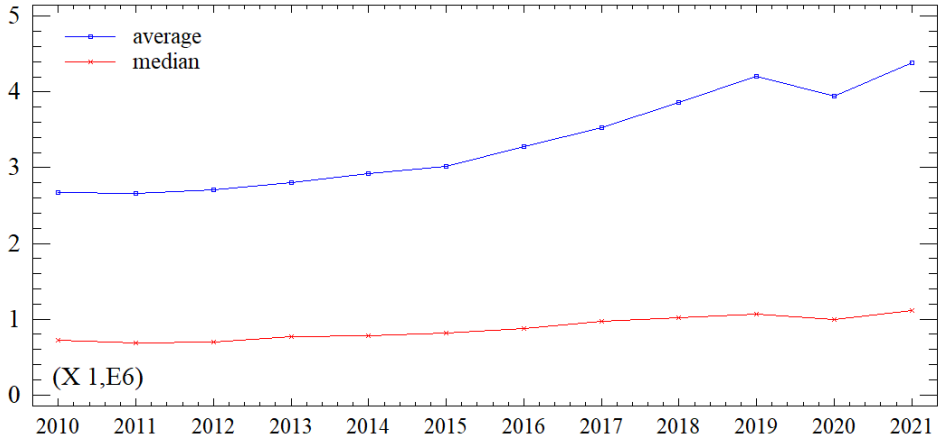


Figure 6. Development of average/median of tax incomes in the period 2010 – 2021 (absolute values)

Source: Own processing

As the results in this graph (Figure 6) indicate, behind the differences between individual years, it is necessary to look at the overall development of tax revenues of the research sample, not the impact of the COVID-19 pandemic. The increase in tax revenues at at least 6.25% is also uniform, which is the case of Liberec. On the contrary, Jihlava recorded the highest year-on-year increase (14.15%). When comparing the average value and the median in 2021, it is possible to observe a higher growth in the case of the first of the mentioned median values, which may indicate a change only in the units of the evaluated subjects. These results indicate differences in the impact of the COVID-19 pandemic on the amount of funds each entity manages. Of course, changes can also be caused by other factors, which can be the subject of further research.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

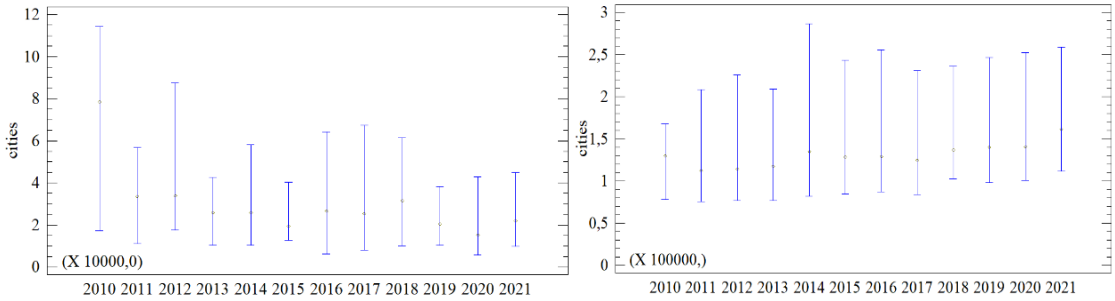


Figure 7. Development of non-tax (1.) and capital (2.) incomes in the period 2010 – 2021 (absolute values)

Source: Own processing

In the case of non-tax income (Figure 7, or graph on the left) as well as capital income (Figure 7, or graph on the right), the impact of the COVID-19 pandemic on absolute results was not demonstrated, which can be visually identified from the mentioned pair of graphs, see Fig. 7. We came to similar conclusions in the case of the last monitored variable, i.e., received transfers. What is interesting, however, is that the given situation is not the result of uniform development across the individual evaluated cities. In the case of non-tax revenues, a year-on-year decrease in 2021 can only be observed in the case of 7 cities, namely Č. Budějovice, Karlovy Vary, Karviná, Most, Opava, Prostějov and Ústí n. Labem. The same is true of capital income, which saw a year-on-year increase in 22 out of 29 cities in the last evaluated year. The opposite situation, i.e., the majority group of cities with a negative change in 2021, is also observed in the case of accepted transfers. The heterogeneity of the impact supports the idea of the need for more in-depth research focusing on specific cities and the factors influencing the results obtained.

4.2 Evaluation of changes for individual evaluated cities

Out of the total sample of 29 evaluated cities, 28 had a higher volume of finances in 2021 than in the previous year, see Figure 8.

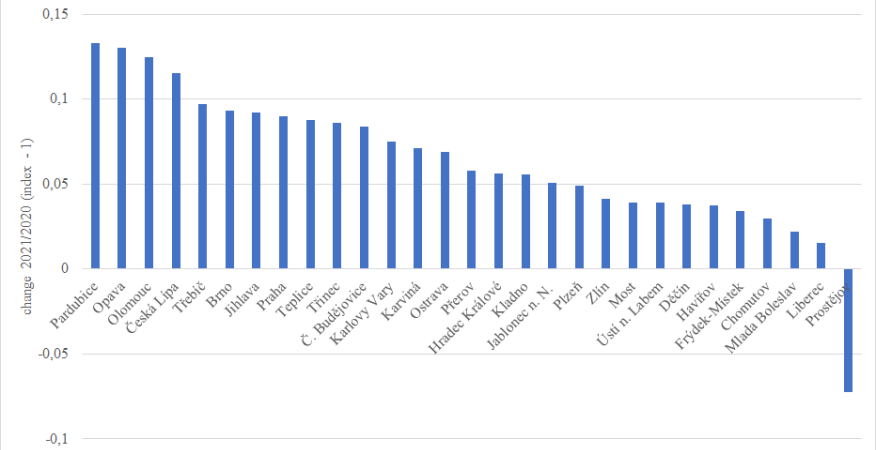


Figure 8. Year-on-year change in total income at the level of individual evaluated cities

Source: Own processing

From Fig. 8, it is evident that the only exception is the city of Prostějov, in which case we observe a decrease of approx. 88,228 thousand. CZK. In 4 cities, the increase is over 10%, supporting the idea that the general budget will not be affected by the COVID-19 pandemic 2021. These cities include Pardubice (+13.30%), Opava (+13.02%), Olomouc (+ 12.49%) and Česká Lípa (+11.52%). Of the four cities mentioned, only Opava is territorially divided according to the valid statute; the other three are undivided.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

Table 1. Evaluation of changes in 2021 in individual evaluated cities (revenues according to type)

Revenue's type	P	P1	P2	P3	P4
Increase	28	29	22	21	8
Decrease	1	0	7	8	21

Source: Own processing

Looking at the individual revenues of the general budget by type and changes in 2021, we note uniformity only in the case of tax revenues, for which, in all cases, we observe an increase at the level of 6.25-14.15%. Therefore, it is possible to look for the rise in total income primarily in the increase in tax income, which makes up most of every general budget in the Czech Republic. However, it is also not clear-cut for other incomes, while we can state that the manifestation of the COVID-19 pandemic may be primarily a drop in received transfers in some cases by up to 28% of the value in the previous year.

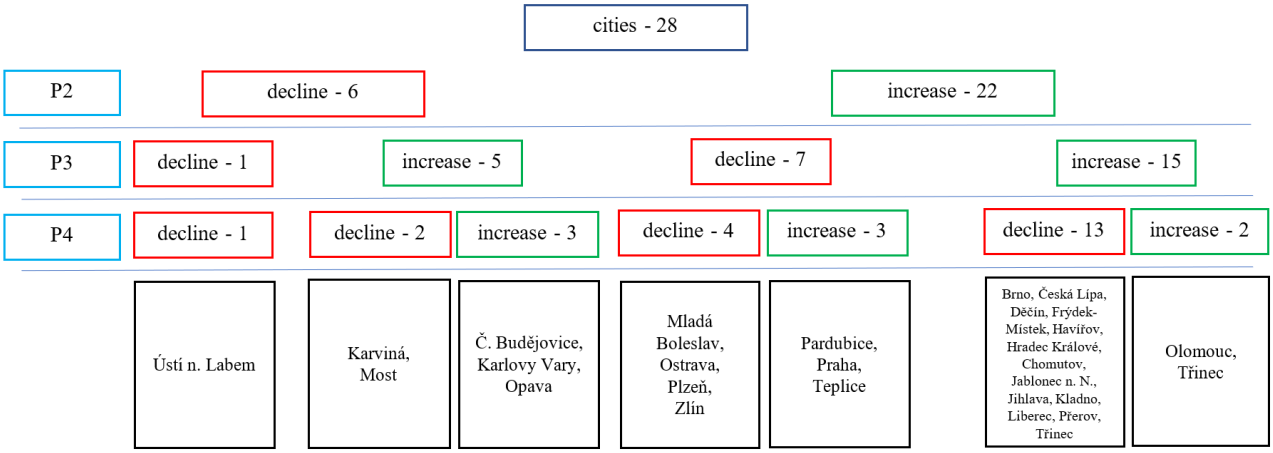


Figure 9. Classification of municipalities based on changes in incomes by type in 2021

Source: Own processing

In the graphic classification of cities, Prostějov is absent, as it was the only city that recorded a decrease in total revenues and took into account tax revenues, since in all 29 cases, an absolute increase in the volume of finances is recorded. The group of 13 cities in which the increase in non-tax and capital income is accompanied by a decrease in the volume of received transfers can be identified as the most numerous.

Only in the case of the cities of Olomouc and Třinec can we see and state an increase across each of the incomes by type. From the point of view of territorial division or non-division of the city into city districts or city parts, no quantifiable difference can be traced between the evaluated cities.

Conclusions

The presented research aimed to quantify the impact of the COVID-19 pandemic on the budgets of selected cities in the Czech Republic. It was fulfilled through 3 research questions:

RQ1: Has the impact of the COVID-19 pandemic manifested itself on the volume of finances managed by the individual cities in the evaluated sample?
RQ2: Is it necessary to assess the impact of the COVID-19 pandemic individually or aggregated?
RQ3: Is it possible to trace the difference in management between territorially divided and non-territorially divided statutory cities in the Czech Republic?

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

The results mentioned above of our analysis allow us to state that all research questions have been answered, and thus, the aim of this research has been fulfilled. Their novelty lies in the topicality of data used and the sample of 29 largest cities in the Czech Republic, which are not often the subject of independent research. The COVID-19 pandemic did not affect the total income of the 29 cities that were part of the research sample. However, the impact must be perceived at the level of individual subjects, while differences can be observed in tax, non-tax, capital income, and received transfers. From our point of view, it is not possible to perceive the impact of the COVID-19 pandemic in aggregate, as each city dealt with it differently and in its own way. The research carried out brought more questions than answers. The issue of the time interval in which the impact of the COVID-19 pandemic can be monitored must be added to the central theme. A one-year gap may not be enough, which can be helped by the continuation of the started research in the form of an extension of the monitored timeline by 2022. It should be noted here that the presented research works with the latest available data and the proper extension of the timeline by data for the year 2022, respectively, with the inclusion of a time gap of 1 or 2 years to quantify the impact of the COVID-19 pandemic will be the subject of further research. The second question is the accurateness of the assessment of the impact of the COVID-19 pandemic in aggregate. The research results did not reflect (partial) trends across individual entities or in the division into territorially divided and undivided cities. Thus, the question of correct identification of subjects for further research and quantification of the impact of the COVID-19 pandemic in the form of case studies is pressing. One possibility is the classification of cities captured in Figure 8, which divides cities based on changes in 2021. However, from the view of individual results, we can mark received transfers as the group of incomes potentially most affected by the COVID-19 pandemic. However, this assumption, like the entire research, needs to be interpreted with caution, and the above conclusions should first be verified by extending the timetable or by a closer analysis of expenditures within the city budgets or in the created groups.

We firmly believe that the results obtained can be used for further research into the impact of the COVID-19 pandemic on the management of local self-government entities, not only in the Czech Republic. Our findings can be used to set newly prepared legislation intended to reduce the deficit of public finances as a starting point or benchmark for more comprehensive research in the given area.

Appendix 1. Alphabetical list of evaluated cities in the Czech Republic, 2021

City	Inhabitants in 2021	The area of the territory (km^2)	Region	Structure
Brno	382 405	230.18	South Moravian region	29 (P)
České Budějovice	94 229	55.60	South Bohemian region	-
Česká Lípa	37 361	66.10	Liberec region	-
Děčín	47 951	117.70	Ústí region	-
Frýdek-Místek	55 006	51.56	Moravian Silesian region	-
Havířov	70 165	32.08	Moravian Silesian region	-
Hradec Králové	92 683	105.69	Hradec region	-
Chomutov	48 349	29.25	Ústí region	-
Jablonec n. N.	45 317	31.38	Liberec region	-
Jihlava	51 125	87.87	Vysočina region	-
Karlovy Vary	48 319	59.08	Karlovy Vary region	-
Karviná	50 902	57.52	Moravian Silesian region	-
Kladno	68 896	36.97	Central Bohemian region	-
Liberec	104 261	106.09	Libere region	1 (D)
Mlada Boleslav	44 506	28.90	Central Bohemian region	-
Most	65 341	86.94	Ústí region	-
Olomouc	100 514	103.33	Olomouc region	-
Opava	55 996	90.61	Moravian Silesian region	8 (P)
Ostrava	284 982	214.23	Moravian Silesian region	23 (D)
Pardubice	91 755	82.66	Pardubice region	8 (D)
Plzeň	175 219	137.67	Pilsen region	10 (D)
Praha	1 335 084	496.21	Prague	57 (P)
Prostějov	43 381	39.04	Olomouc region	-
Přerov	42 451	58.45	Olomouc region	-
Teplice	49 705	23.78	Ústí region	-
Třebíč	35 107	57.59	Vysočina region	-
Třinec	35 006	85.36	Moravian Silesian region	-
Ústí n. Labem	91 982	93.97	Ústí region	4 (D)
Zlín	74 478	102.83	Zlín region	-

*city districts (D) or city parts (P)

References

Aristovnik, A. (2012). Fiscal Decentralisation In Eastern Europe: Trends and Selected Issues. *Transylvanian Review of Administrative Sciences*, 37E, 5-22. http://doi.org/10.2139/ssrn.2187475

Bečica, J., Vavrek, R., Galecka, M., & Smolny, K. (2021). Application of Multi-Criteria Analysis on Theatres' Efficiency - Czech and Polish Comparative Case Studies. *Croatian and Comparative Public Administration*, 21(3), 423-455. https://doi.org/10.31297/hkju.21.3.5

Botta, A., Caverzasi, E., & Russo, A. (2020). Fighting the COVID-19 Crisis: Debt Monetisation and EU Recovery Bonds. *Intereconomics*, 55, 239-244. https://doi.org/10.1007/s10272-020-0907-z

Cantó, O., Figari, F., Fiorio, CV., Kuypers, S., Marchal, S., Romaguera-de-la-Cruz, M., Tasseva, IV., & Verbist, G. (2021). Welfare Resilience at the Onset of the COVID-19 Pandemic in a Selection of European Countries: Impact on Public Finance and Household Incomes. *Review of Income and Wealth*, 68(2), 293-322. https://doi.org/10.1111/roiw.12530

Conte, A., Lecca, P., Sakkas, S., & Salotti, S. (2020). The territorial economic impact of COVID-19 in the EU: a Rhomolo analysis. Retrieved August 10, 2024, from https://joint-research-centre.ec.europa.eu/reports-and-technical-documentation/territorial-economic-impact-COVID-19-eu-rhomolo-analysis_en

Cuadrado-Ballesteros, B., Garcia-Sánchez, I. M., & Prado-Lorenzo, J. M. (2013). Modes of Public Serivces Delivery The Case of Spanish Local Governments. *Lex Localis – Journal of Local Self-Government*, 11(2), 119-137. https://doi.org/10.4335/241

Daňková, A., Čepelová, A., & Koreňová, D. (2017). Process Efficiency of Local Self-Government in Slovak Republic. *Journal of International Studies*, 10, 309-317. https://doi.org/10.14254/2071-8330.2017/10-2/21

De Mello, L. R. (2000). Fiscal Decentralisation and Intergovernmental Fiscal Relations: A Cross-Country Analysis. *World Development*, 28(2), 365-380. https://doi.org/10.1016/S0305-750X(99)00123-0

Exner, J. (2004). *Municipalities, cities, town districts: on local public administration and its deconcentration by statutory decrees in territorially divided cities*. Prague: Libri.

Finzgar, M., & Oplotnik, Z. J. (2013). Comparison of Fiscal Decentralization Systems in EU-27 According to Selected Criteria. *Lex Localis – Journal of Local Self-Government*, 11(3), 651-672. https://doi.org/10.4335/11.3.651-672(2013)

Foremny, D., Sorribas-Navarro, P., & Castelló, J. (2020). Living at the Peak: Health and Public Finance During the COVID-19 Pandemic. Retrieved August 15, 2024, from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3578483

Governatori, M., & Yim, D. (2012). Fiscal Decentralisation and Fiscal Outcome. *Economic Papers*, 468, 1-28.

Heald, D., & Hodges, R. (2020). The accounting, budgeting and fiscal impact of COVID-19 on the United Kingdom, Journal of Public Budgeting. *Accounting & Financial Management*, 32(5), 785-795. https://doi.org/10.1108/JPBAFM-07-2020-0121

Hejduková, P. (2015). *Public finance*. Prague: C.H. Beck.

Hendrych, D., Kavěna, M., & Pavlík, M. (2014). *Administrative science: theory of public administration*. Prague: Wolters Kluwer.

Kočí, R. (2012). *Municipal self-government in the Czech republic: a practical handbook with jurisprudence*. Prague: Leges.

Kopecký, M. (2017). *Legal status of municipalities and regions – basics of municipal law*. Prague: Wolters Kluwer.

Koudelka, Z., Průcha, P., & Zwyrtek Hamplová, J. (2019). *Act on municipalities (municipal establishment)*. Prague: Leges.

Mazllami, J. (2021). Fiscal Decentralisation and Alternative Financial Sources for the Local Self-Government in Republic of North Macedonia – Overview. *SEEU Review*, 16, 14-29. https://doi.org/10.2478/seeur-2021-0006

Mazllami, J., & Osmani, R. (2014). The Impact of the Fiscal Decentralization Process in the Local Public Finance of the Western Balkan Countries: A Comparative Analysis. *Economy & Business Journal*, 8, 730-741.

Mokrá, K., Poláková, G., Horváthová, P., & Stverková, H. (2023). Work Engagement and Burnout Syndrome of Civil Servants during and after the COVID-19 Pandemic. *Polish Journal of Management Studies*, 27(1), 221-240. https://doi.org/10.17512/pjms.2023.27.1.13

Mura, L., Buleca, J., Horváth, P., Machyniak, J., & Šebík, K. (2014). Identification of Funding of Regional Governments Using Correlation Analysis. *Procedia Economics and Finance*, 15, 154-161. https://doi.org/10.1016/S2212-5671(14)00466-3

Neubauerová, E. (2003). *Financial aspects of public administration decentralisation*. Bratislava: Ekonóm.

Oates, W. E. (1972). *Fiscal Federalism*. New York: Harcourt Brace Jovanovich.

Opera, F., Onofrei, M., Paraschiv, G., & Cojorcariu, L. (2022). Do Local Budgets Influence Regional Development? Empirical evidence from Romania. *Lex Localis – Journal of Local Self-Government*, 20(1), 77-99. https://doi.org/10.4335/20.1.77-99(2022)

Papcunová, V., Vavrek, R., & Dvořák, M. (2021). Role of Public Entities in Suitable Provision of Public Services: Case Study from Slovakia. *Administrative Sciences*, 11(4), 143. https://doi.org/10.3390/admsci11040143

Provazníková, R. (2015). *Financing cities, municipalities and regions: theory and practice*. Prague: Grada Publishing.

Průcha, P. (2011). *Local administration*. Brno: Masaryk University.

Rodden, J. (2002). The Dilemma of Fiscal Federalism: Grants and Fiscal Performance around the World. *American Journal of Political Science*, 46(3), 670-687. https://doi.org/10.2307/3088407

Sedmihradská, L., & Bakoš, E. (2016). Municipal Tax Autonomy and Tax Mimicking in Czech Municipalities. *Lex Localis – Journal of Local Self-Government*, 14(1), 75-92. https://doi.org/10.4335/14.1.75-92(2016)

Shin, G. (2017). Corporate Tax Policy and Multinational Corporations in the American States: Exploring the Intervening Effect of Local Fiscal Decentralization. *Journal of Urban Affairs*, 40(5), 679-704. https://doi.org/10.1080/07352166.2017.1360728

Slavinskaite, N. (2020). Review of Fiscal Decentralization in European Countries. *International Journal of Contemporary Economics and Administrative Sciences*, 10(2), 345-355. https://doi.org/10.5281/zenodo.4429787

Svoboda, F., Špalková, D., Špaček, D., Bakoš, E., Šelešovský, J., Špačková, Z., Štarhová, I., Soukopová, J., Škarabelová, S., & Pavlík, M. (2017). *Economy of public sector*. Prague: Ekopress.

Tiebout, C. M. (1956). A Pure Theory of Local Expenditure. *Journal of Political Economy*, 64, 416-424. https://doi.org/10.1086/257839

Tománek, P. (2017). Tax revenues structure of municipal budgets in size groups of municipalities. In: I. Vaňková (Ed.), 12th International Scientific Conference on Public Economics and Administration 2017 (pp. 342-346). Ostrava (Czechia): VŠB-TU Ostrava.

Varadzin, F., & Bečica, J. (2016). *Municipalities and production potential*. Prague: Professional Publishing.

Vartasová, A., & Červená, K. (2023). Position of the Local Development Fee in the System of Local Taxes and Fees in the Slovak Republic. *Lex Localis – Journal of Local Self-Government*, 21(3), 525-544. https://doi.org/10.4335/21.3.525-544(2023)

Vavrek, R. (2024a). How much is too much: A case study of local self-government units in Slovakia using absolute variability to determine the importance of financial criteria in MCDM analysis. *PLOS ONE*, 19(10), e0311842. https://doi.org/10.1371/journal.pone.0311842

Vavrek, R. (2024b). Spatial Interpretation of Multi-Criteria Analysis: A Case Study with a Decreasing Number of Criteria and Subjective Approach to Determining Their Importance. *Mathematics*, 12(22), 3497. https://doi.org/10.3390/math12223497

Vavrek, R., & Bečica, J. (2022). Similarity of TOPSIS results based on criterion variability: Case study on public economics. *PLOS ONE*, 17(8), e0271951. https://doi.org/10.1371/journal.pone.0271951

Vavrek, R., Papcunová, V., & Tej, J. (2020). Evaluation of Financial Management of Towns in relation to Political Cycles using CV-TOPSIS. *Lex Localis – Journal of Local Self-Government*, 18(2), 231-252. https://doi.org/10.4335/18.2.231-252(2020)

Funding: This research was supported by the Student Grant Competition of the Faculty of Economics, VSB-Technical University of Ostrava, project registration number SP2023/064 “Public budgets as a basis for the use of multi-criteria methods”.

Data Availability Statement: Data are publicly available on the website www.monitor.cz

Author Contributions: Conceptualisation: *Roman Vavrek, Jiří Bečica*; methodology: *Roman Vavrek*; data analysis: *Roman Vavrek, Jiří Bečica, Viera Papcunová, Michal Konečný;* writing—original draft preparation: *Roman Vavrek, Jiří Bečica*, writing; review and editing: *Roman Vavrek*; visualisation: *Roman Vavrek*. All authors have read and agreed to the published version of the manuscript.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m2849939775

Jiří BEČICA is an assistant professor at the Faculty of Economics, VSB - Technical University of Ostrava, Czech Republic. Research interests: public budgets, municipalities, local self-government, culture, education
ORCID ID: https://orcid.org/0000-0002-6005-9093

Roman VAVREK is an assistant professor at the Faculty of Economics, VSB - Technical University of Ostrava, Czech Republic. Research interests: MCDM analysis, statistics, econometry, public budgets, local self-government
ORCID ID: https://orcid.org/0000-0002-6047-9434

Viera PAPCUNOVÁ is an associate professor at the Faculty of Natural Sciences and Informatics, Constantine the Philosopher University in Nitra, Slovakia. Research interests: local self-government, regional development, municipalities
ORCID ID: https://orcid.org/0000-0003-1236-0639

Michal KONEČNÝ is an assistant professor at the Faculty of Corporate Strategy, Institute of Technology and Business in České Budějovice. Research interests: marketing, online reputation, consumer behavior
ORCID ID: https://orcid.org/0000-0001-7926-257X

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Publisher
http://jssidoi.org/esc/home

CHANGES TOWARD SUSTAINABILITY IN CONSUMER PURCHASING BEHAVIOUR OF EVERYDAY PRODUCTS*

Irena Baláková [1], Michal Pšurný [2], Jana Stávková [3], Veronika Švecová [4]

[1,2,3] *Department of Marketing and Trade, Faculty of Business and Economics, Mendel University in Brno, Zemědělská 1665/1, 613 00 Brno, Czech Republic*

E-mails:[1] irena.balakova@mendelu.cz; [2] michal.psurny@mendelu.cz; [3] stavkova@mendelu.cz; [4] xsvecov2@mendelu.cz

Received 15 August 2024; accepted 22 November 2024; published 30 December 2024

Abstract. This study aims to identify the factors that influence sustainable consumer purchasing behaviour in the food and everyday products market, which can be used to influence consumer purchasing patterns toward sustainable consumption. The factors commonly observed to influence purchasing decisions, such as price, quality, packaging, and brand, were complemented by factors such as sustainable production, nutritional composition, health benefits, and the product's origin. These additional factors also exert a significant influence on consumer purchasing decisions. A principal component analysis (PCA) identified four determinants of sustainable consumer purchasing behaviour (Product Features, Environmental Responsibility, Comfort and Accessibility, and Pricing). The influence of determinants on real, sustainable purchasing behaviour is evaluated using a PLS-SEM model. The PLS-SEM structural modelling demonstrated a significant impact of all determinants on real, sustainable purchasing behaviour. The first determinant (Product Features) indicates that an individual's rational behaviour is related to sustainability. These variables relate to product quality, nutritional composition, origin, health benefits, and product breadth. Additionally, they reflect attitudes toward life values and norms. Determinant Environmental Responsibility reflects the importance of sustainable practices by both manufacturers and retailers as perceived by consumers. Determinant Comfort and Accessibility encompass the variables most influenced by those who create the external shopping environment, control the marketing tools, and sellers that address the customer (point of sale, accessibility, loyalty to the chain, etc.). The last determinant (Pricing) represents rational decision-making and is subject to the consumer's financial circumstances.

Keywords: sustainable consumer behaviour; structural modelling; purchasing factors; environmental responsibility; determinants of consumption

Reference to this paper should be made as follows: Baláková, I., Pšurný, M., Stávková, J., Švecová, V. (2024). Changes toward sustainability in consumer purchasing behaviour of everyday products. *Entrepreneurship and Sustainability Issues*, 12(2), 364-377. http://doi.org/10.9770/s6343526349

JEL Classifications: D12, M31, Q56

1. Introduction

The ongoing societal changes (climatic, economic, political, etc.) are gathering pace. Five key trends currently affect consumers: digital adoption, consumer mobility patterns, value-based purchasing behaviour, lifestyle in the context of health and exercise, and social interactions supporting changes in human behaviour. The quest to understand individual behaviour is associated with sustainability, not only within scientific circles (Gavurova et al., 2022; Arilla-Llorente et al., 2024). Since the definition of 'sustainability' in 1994, it has slowly entered the public consciousness. Government interventions or political proclamations contained in the strategic

* *This research was funded by the grant No. IGA-PEF-TP-23-012 of the Grant Agency of the Faculty of Business and Economics at Mendel University in Brno and by the project CZ.02.1.01/0.0/0.0/16_017/0002334 Research Infrastructure for Young Scientists, co-financed by Operational Programme Research, Development and Education.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

objectives of individual countries have an impact on sustainability and its acceptance (Skare et al., 2023, 2024). To achieve desirable Sustainable Development Goals (SDGs), such as SDG 12 on ensuring sustainable consumption (United Nations, 2024), much more effort is needed on the human individual, both in different roles (consumer, producer, discoverer) and with different capabilities. Each individual is critically responsible for his behaviour, affecting his current and future well-being and future generations (Moschis et al., 2020). To achieve sustainability, we must continually address and educate ourselves on this issue. For effective educational activities, it is essential to know the behavioural patterns of individuals across generations. Knowing the best channels through which information can be conveyed and how best to engage with particular age groups is essential.

This paper aims to understand the factors influencing sustainable consumer purchasing behaviour in the food and everyday products market through which a change in consumer purchasing patterns toward sustainability in everyday consumption can be achieved. Real consumer behaviour can be influenced through behavioural determinants, where individual determinants are given by factors affecting the consumer's purchasing decision process. The study also offers the option of determining the direction of action of the individual determinants of real, sustainable consumer behaviour. Exact methods and the food and everyday products (i.e., pharmaceuticals and drugstores) are used to understand the impact of the determinants on consumer behaviour.

2. Literature review

Sustainable consumption is mainly related to increasing the use of renewable resources, minimising waste and emissions, and improving quality of life (Šajn, 2020). Purvis et al. (2019) discuss environmental and economic sustainability in the context of profit and social sustainability.

Shehawy and Ali Khan (2024) show that environmental awareness influences the link between pro-environmental sentiments and consumer behaviour. Paço et al. (2018) add that concern for the future is associated with pro-social attitudes and purchasing behaviour toward environmentally friendly products. Moschis et al. (2020) also state that one of the main approaches to sustainable consumption is to shape food demand, which would require changes in current food consumption patterns. Phan (2023) and Messner et al. (2022) state that monitoring food consumption and paying attention to food production with sustainability in mind is appropriate.

Waldman et al. (2022) distinguish four segments of consumers according to their attitudes toward sustainability in behaviour: the first behaves sustainably when it is economically advantageous or they believe in health benefits; the second segment sees sustainability benefits in product freshness; the third segment is characterised by a high degree of environmental attention, and the fourth segment behaves unsustainably. Among the factors influencing sustainable consumer behaviour, Lavuri et al. (2023) include egoistic, altruistic values, and social motivations. Factors affecting consumption structure, i.e., healthy lifestyles accompanied by different diets and various food supplements, are gaining importance (Akkaya, 2021; Jadhav et al., 2023). Harrison et al. (2022) and Teireira et al. (2022) also link the concept of healthy food and sustainable healthy eating to consumption. This was confirmed by Govaerts and Olsen (2023), who investigated the influence of nontraditional foods, or seaweed, where consumers were found to have a positive relationship between attitudes toward sustainable consumption and realised consumption. According to Jadhav et al. (2023), consumption determinants include knowledge about healthy lifestyles, product quality, availability, and price. However, according to Akkaya (2021), a healthy lifestyle indirectly influences sustainable consumption because it affects the respected values perceived by the consumer, which subconsciously determines the expressed purchase intention.

Zámková et al. (2021) explain that customer preferences have changed over the years and currently emphasise the effects of health aspects of food. Consumers who perceive a product as beneficial to their health and the environment are likelier to purchase it (Dorce et al., 2021). Products with an organic label are perceived by consumers as healthier and safer with minimal environmental impact (Bu et al., 2020). Petrescu et al. (2020) state that consumers mainly consider nutritional composition when evaluating the health aspects of food. Consumers who pay attention to ingredients are more likely to appreciate the environmental benefits of a product and purchase it despite the higher price (Coderoni & Perito, 2020).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Other factors consumers should address in the context of sustainable consumption are the origin of products and product packaging (De Canio & Martinelli, 2020; Ge et al., 2024; Thøgersen et al., 2019). De Canio (2023) explains that informed consumers prefer eco-friendly packaging. Consumers are willing to pay extra for sustainable packaging (Herrmann et al., 2022). However, as Otto et al. (2021) point out, sustainability intentions do not always match the resulting real behaviour, as consumer knowledge is limited, and sometimes consumers do not recognise sustainable packaging. Labels that promote the selection and consumption of more sustainable foods and beverages play an important role in consumer decision-making (Potter et al., 2021). Boßow-Thies (2021), in a study on packaging-free products, stated that consumers must be adequately motivated to purchase packaging-free products as there are issues associated with this purchase in the context of hygiene and convenience.

Furthermore, the friendliness of the attendant or courier significantly impacts the purchase decision, and improved interactions can increase customer satisfaction and positive recommendations (Ma & Kim, 2021). On the other hand, some customers prefer unattended shopping (Olsson et al., 2022). Also, Bosch et al. (2024) discuss the popularity of self-service shopping; however, there is no evidence of an impact in the context of sustainability. A compromise between traditional and self-service shopping can be represented by the service of a digital robotic human (Moore et al., 2021). Loyalty to a retail chain is another factor influencing consumers' purchasing decisions and in the context of sustainability, González-Viralta et al. (2023) report that consumers are more likely to remain loyal to a store where green practices are developed. However, sustainability as an instrumental element in customer loyalty may not be true in all countries (Fernando et al., 2017). In addition to loyalty, the choice of a retail chain is influenced by accessibility to consumers. Mattioli and Anable (2016) explain that consumers prefer to travel by car for major weekend shopping trips. Pan et al. (2019) report that the choice of transportation for shopping in terms of public transport or a car is determined by the store's location and the parking cost.

Today, based on advanced scientific knowledge, the model of planned behaviour of Ajzen's model (2020) is known for identifying the factors that influence real consumer behaviour, which states the direct influence of intention on real behaviour, while the intention is directly influenced by determinants such as consumer attitudes, subjective norms, and behavioural control. These models contribute to the prediction of consumer behaviour in satisfying needs. For example, research by Soorani and Ahmadvand (2019) showed that attitudes, perceived behavioural control, subjective norms, and guilt were drivers of food consumption management and food waste avoidance. Models of consumption behaviour can be used in other consumption areas; Bhutto et al. (2022) show the importance of environmental appeals in electricity consumption.

To achieve sustainable consumption of food and other products consumed daily in households, behavioural changes need to be targeted, and it is desirable to initiate change among consumers themselves through factors that influence behaviour. Understanding these factors in this study fills the existing research gap in the purchasing behaviour of sustainable products represented by food and everyday products (drugstores, pharmaceuticals). Diaconeasa et al. (2021) explain that the topic of sustainable food consumption and the aspects that influence it are complex, and it is desirable to try to change consumer behaviour through marketing strategies and even national and international policies in favour of sustainable consumption.

3. Data and methods

A questionnaire survey was conducted to understand consumer behaviour in the context of ongoing changes in society and to identify factors that influence the decision-making process of consumers purchasing sustainable food and everyday products. The survey was carried out in October and November 2023 using the CAWI (Computer Assisted Web Interviewing) method and obtained a representative sample (n = 700) according to the applied quotas (age, gender, and highest educational attainment, see Table 1). In specific questions, respondents were asked to assess the importance of certain factors in their purchasing decisions. (listed in Table 2). They indicated the strength of the influence of the factors on a numerical scale of 1-7, where the number 1 meant that the factor was the least important and the number 7 meant that the factor was the most important. The data were confirmed to follow a normal distribution.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Table 1. Characteristics of the research sample (n=700)

	Questionnaire survey n = 700, [%]	Baseline population [%]
Gender		
Male	48.9	49.3
Female	51.1	50.7
Age group (years)		
18–25	9.0	9.0
26–35	15.6	15.6
36–45	19.1	19.0
46–55	17.7	17.7
56–65	15.0	15.0
66 and more	23.6	23.6
Economic activity		
Employees	49.4	47.3
Private entrepreneurs	5.3	7.4
Old-age pensioners	26.3	23.6
Unemployed	3.0	2.8
Students	5.1	15.2
Maternity or parental leave	6.7	2.3
Other	4.1	1.3
Disposable household income		
Less than CZK 30,000 (EUR 1,250)	20.6	39.3
CZK 30,001–50,000 (EUR 2,083)	40.1	29.4
CZK 50,001–70,000 (EUR 2,917)	17.7	18.2
CZK 70,001–90,000 (EUR 3,750)	6.6	8.0
More than CZK 90,000 (EUR)	4.1	5.0
I don't want to tell	10.9	-
Number of household members		
1	17.4	29.6
2	39.0	32.6
3	20.3	18.0
4	16.0	15.6
5 or more	7.2	4.3
Number of children in the household		
0	69.3	54.2
1	15.6	22.0
2	12.9	19.6
3	1.7	3.5
4 or more	0.6	0.7
Educational attainment		
Elementary education	7.7	13.6
Vocational/trade school	39.0	33.7
Full secondary education	29.6	33.6
University degree	22.6	19.1
Size of municipality of residence		
Less than 3,000 inhabitants	24.4	33.4
3,001–20,000 inhabitants	21.1	24.9
20,001–100,000 inhabitants	28.7	20.8
More than 100,000 inhabitants	25.7	20.9

Source: own questionnaire processing (n = 700), Eurostat (2023).

Factor analysis was applied to identify the determinants of sustainable purchasing decisions. Factor analysis begins with creating a correlation matrix of the variables under study and determining whether there is a moderate to strong correlation between the variables (Brown et al., 2011). Based on these correlations, factors are organised to produce behaviour determinants. The number of determinants is established through eigenvalue analysis. The eigenvalues should be greater than 1, which satisfies the Kaiser-Guttman criterion (Garson, 2023). Orthogonal rotation of factor loadings is used for interpretation using the Simple Varimax method.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Table 2. Evaluated factors that entered the factor analysis

Q number	Variable
Q1_1	Price
Q1_2	Product quality
Q1_3	Product breadth
Q1_4	Purchase without packaging
Q1_5	Product origin
Q1_6	Nutritional composition
Q1_7	Packaging and product design
Q1_8	Brand
Q1_9	Discounts
Q1_10	Sustainable production
Q1_11	Health benefits of the product
Q2_1	Staff behaviour
Q2_2	Distance from the place of residence
Q2_3	Transport accessibility
Q2_4	Loyalty

Source: own questionnaire processing.

Structural modelling, specifically the PLS-SEM (Partial Least Square - Structural Equation Modeling) reflective structural model, is used to test whether these determinants have an impact on real consumer behaviour that is sustainable. The model was constructed using SmartPLS software (v. 4.1.0.8) to build the model. The model works with the same variables as factor analysis, but the resulting determinants are considered. The latent variables in the model are these determinants, and the indicators of the latent variables are the variables (questions Q1_1 - Q1_11 and Q2_1 - Q2_4). In addition, the latent variable Real behaviour enters the model. Indicators (statements from Table 3) were used in constructing this model. Respondents expressed their level of agreement with these statements using a 7-point Likert scale.

Table 3. Indicators (questions, statements) for constructing the latent variable Real behaviour

Q number	Statement
Q3_1	I buy food from sustainable production.
Q3_2	I buy healthy food.
Q3_3	I am willing to pay extra for sustainable and healthy food.
Q3_4	I prefer to buy locally made products.

Source: own questionnaire processing.

The validity and reliability of the indicators that determine the latent variables are verified using outer loadings. The cut-off value for outer loadings is set to be < 0.7, but lower values are retained if they do not affect the validity and reliability of the model (Fornell & Larcker, 1981; Hair et al., 2021). Cronbach's α, Composite reliability (CR), and Average Variance Extracted (AVE) check whether the assumptions for latent variables are met. The thresholds are set at Cronbach's $\alpha > 0.7$, $CR > 0.7$, and $AVE > 0.5$ (Hair et al., 2014). The model is assessed as valid if the values are slightly lower (Hair et al., 2021). The collinearity of the final model is verified by the Variance Inflation Factor (VIF), which must be < 5 (Hair et al., 2016). Bootstrapping with 5000 subsamples with a confidence interval of two-tailed testing at a 95% confidence level (Aguirre-Urreta & Rönkkö, 2018) is used to assess the significance of the path coefficient. The R^2 value indicates the variability of the Real behaviour. Due to potential multicollinearity issues, discriminant validity is assessed using the Heterotrait-monotrait ratio (HTMT), where the cut-off value is set to 0.9 (Hamid et al., 2017; Henseler et al., 2016). The relevance of the model and the model is verified by Q^2, which must be greater than 0 (Hair et al., 2018). Values > 0 indicate satisfactory predictive relevance of the model (Diaz-Ruiz et al., 2018).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

4. Results

A consumer questionnaire survey identified factors determining consumers' decision-making when purchasing sustainable food and everyday products. In addition to commonly observed factors such as Price, Discounts, Product quality, Packaging, Product design, and brand were supplemented by additional factors such as Sustainable production, Nutritional composition, and Health benefits of the product or Product origin, which also influence purchasing decisions. This initial preliminary information had to be verified using appropriate methods that allow the information obtained to be generalised at a certain probability level or, with this probability, what behaviour can be expected.

To identify the factors active in the purchase decision process, 15 variables were included in the factor analysis: Price, Product quality, Product breadth, Purchase without packaging, Product origin, Nutritional composition, Packaging and product design, Brand, Discounts, Sustainable production,

Health benefits of the product, Staff behaviour, distance from the place of residence, Transport accessibility, and loyalty (see Table 5). Factor analysis allows quantifying the factors that influence consumers' sustainable purchasing decisions. The suitability of this method was verified by the Kaiser-Meier-Olkin criterion (KMO), and Bartlett's Test of Sphericity (Table 4), and the data set meets the requirements.

Table 4. Verification of the suitability of the factor analysis application.

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy		0.830
Bartlett's Test of Sphericity	Approximate Chi-Square	3335.195
	Degrees of Freedom (df)	105
	Significance (p-value)	0.000

Source: own questionnaire processing (n = 700) in IBM SPSS Statistics.

The factor analysis using Principal Component Analysis (PCA) identified four determinants of sustainable consumer purchasing behaviour (Table 5). The determinants are ranked according to their contribution to explaining the variability under study, and the variables within the determinants are ranked from those with the highest Factor Loadings, i.e., the proportion of how they contribute to explaining the determinant.

The resulting Table 5 of the analysis performed works with Varimax rotation. In the partial results of the factor analysis without rotation, the eigenvalues range from 1.101 to 4.695.

Table 5. Results of Principal Component Analysis

Extracted Factors	Original Variables	Factor Loadings	Eigenvalue	% of Total Variance (Cumulative)
1. Product Features	Health benefits of the product Q1_11	0.791	2.976	19.837
	Product quality Q1_2	0.769		
	Product origin Q1_5	0.705		
	Nutritional composition Q1_6	0.617		
	Product breadth Q1_3	0.548		
2. Environmental Responsibility	Packaging and product design Q1_7	0.776	2.411	35.909
	Brand Q1_8	0.689		
	Purchase without packaging Q1_4	0.670		
	Sustainable production Q1_10	0.575		

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

3. Comfort and Accessibility	Transport accessibility Q2_3	0.809	1.892	48.522
	Distance from the place of residence Q2_2	0.727		
	Staff behavior Q2_1	0.526		
	Loyalty Q2_4	0.505		
4. Pricing	Discounts Q1_9	0.855	1.804	60.547
	Price Q1_1	0.840		

Source: own questionnaire processing (n = 700) in IBM SPSS Statistics.

The first determinant (Table 5) of sustainable purchasing behavior of food and everyday products is called Product Features, which brings together factors related to the product. These are Health benefits, Product quality, Product origin, and Nutritional composition. The determinant also includes the Product breadth as perceived by the consumer at the point of sale. The second determinant, Environmental Responsibility, brings together variables related to environmental aspects created by sellers and producers in terms of environmental sustainability. Visual communication also has a noticeable influence, telling the customer through the packaging whether the product is sustainable. When deciding on a product's environmental sustainability, customers also consider the packaging and the option of buying without packaging.

The third determinant is Comfort and Accessibility, as it primarily reflects the ease of shopping for consumers. It includes transport accessibility in terms of public transport accessibility and parking options (Transport accessibility), the distance between the store and the place of residence (Distance from the place of residence), the friendliness of the service staff (Staff behaviour), but also the loyalty of the customer to the retail chain (Loyalty). The last determinant, Pricing, is determined by two variables: Price and Discount promotions. Even though the determinant Pricing comprises only two variables, it explains 12% of the examined variability across all variables.

The impact of the above determinants on real consumption behaviour toward sustainability is assessed using a PLS-SEM model. Figure 1 illustrates the model, showing outer loadings, path coefficients, and R^2 values. Most of the outer loadings are < 0.7, while some are close to 0.6. However, the significance level of all indicators is < 0.001 (see Figure 1), and therefore, we retain all indicators for latent variables.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

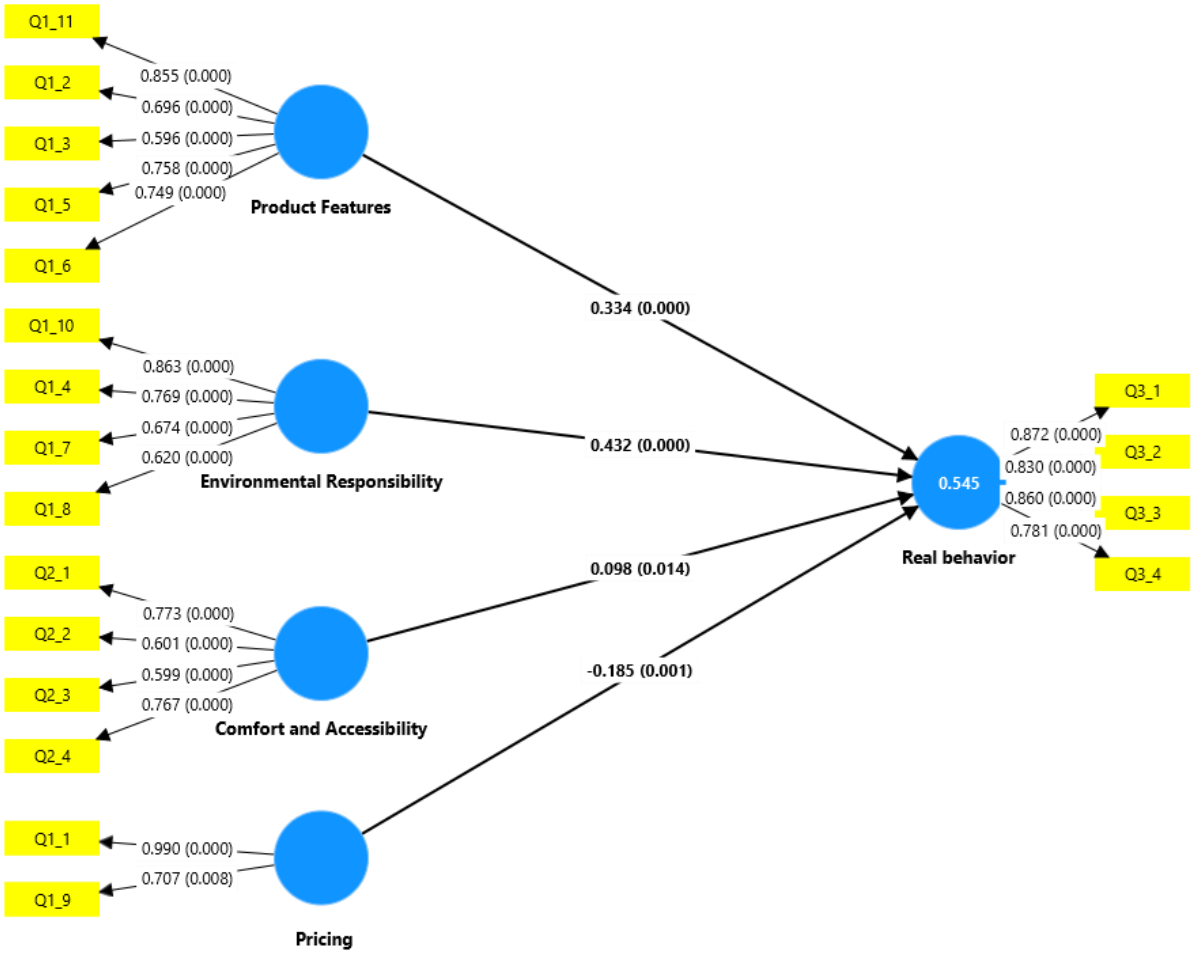


Figure 1. PLS-SEM model with marked outer loadings, path coefficients and R^2.

Source: own questionnaire processing in SmartPLS 4 statistical software.

The reliability and validity of the model are assessed using Cronbach's α, CR, and AVE. The values for each latent variable are shown in Table 6. All values are above the threshold values, only for the latent variable Comfort and Accessibility is Cronbach's α, CR, and AVE slightly lower (<0.04), but this should not affect the model. The collinearity of the final model is assessed by the Internal Variance Inflation Factor (VIF), see Table 6. In all cases, it is less than the specified value of 5.

Table 6. Reliability measurements, convergent validity for PLS-SEM model.

	Cronbach's α	CR	AVE	Inner VIF
Comfort and Accessibility	0.661	0.782	0.476	1.413
Environmental Responsibility	0.730	0.824	0.544	1.667
Pricing	0.750	0.847	0.740	1.097
Product Features	0.790	0.853	0.541	1.668
Real behavior	0.857	0.903	0.700	-

Source: own questionnaire processing in SmartPLS 4 statistical software.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT). All values are less than the threshold of 0.9 (mean HTMT = 0.479). Table 7 reports Path coefficients (P.C.), t-values, and p-values for relationships between latent variables. The table shows that all the latent variables (determinants) significantly influence Real purchasing behaviour toward sustainability ($p < 0.05$). The P.C. values indicate the strength of influence of the given latent variables toward Real behaviour. The model demonstrates that the Environmental Responsibility determinant has the greatest influence (P.C. = 0.432), followed by Product Features (P.C. = 0.334). Comfort and accessibility has the slightest positive influence (P.C. = 0.098), while Pricing shows a negative influence on Real sustainable behaviour (P.C. = -0.185).

Table 7. Results of total effects of the model

	P.C.	t values	p values
Comfort and accessibility -> Real behaviour	0.098	2.468	0.014
Environmental responsibility -> Real behavior	0.432	11.773	0.000
Pricing -> Real behavior	-0.185	3.182	0.001
Product Features -> Real behavior	0.334	7.863	0.000

Source: own questionnaire processing in SmartPLS 4 statistical software

The model explains 54.5% of the variability (see Figure 1, $R^2 = 0.545$). The predictive power of the model is further assessed by the Q^2 predict value, which is always > 0 (Q^2 (Q3_1) = 0.432; Q^2 (Q3_2) = 0.346; Q^2 (Q3_3) = 0.405; Q^2 (Q3_4) = 0.302). These values indicate a satisfactory predictive relevance of the model.

5. Discussion and Conclusions

This part of the paper offers a critical view of the observed factors that influence consumer buying behaviour in the food and everyday products market, not only based on the results obtained from the survey conducted but also in the context of the conclusions of academic studies, articles, and exact methods used. The factor analysis defined four determinants that correspond well to some of the conclusions of the studies examined in the literature search for causes and relationships. A deeper analysis of the variables that make up the determinant's points to the rational behaviour of the individuals addressing mainly Product Features, i.e. nutritional composition, product origin, health aspects, and quality in the purchasing decision. Also, Zámková et al. (2021) state that product features, such as health aspects of products, are currently at the forefront of consumer decision-making when purchasing food. Immediately next, in terms of the importance of determinants of food and everyday product purchasing behaviour, consumers also address variables that express their relationship to sustainability in the context of the environment (determinant Environmental Responsibility). This is in line with Shehawy and Ali Khan (2024), who demonstrate that environmental awareness influences the link between pro-environmental sentiments and consumer behaviour. Similarly, Paço et al. (2018) and Diaconeasa et al. (2021) add that concern for the future is associated with pro-social attitudes and purchasing behaviour oriented toward organic products. These variables further reflect consumers' life values and subjective norms (Ajzen, 2020).

Environmental responsibility demonstrated by manufacturers and retailers can help to increase customer loyalty - this is one of the conclusions of González-Viralta et al. (2023) and this study also identified the importance of loyalty as an additional determinant. The third determinant is named Comfort and Accessibility and includes customer-desired ease of accessibility in addition to the habitual and loyalty elements associated with customer convenience. Here, the effect of marketing tools and how retailers address the customer (advertising, point of sale, accessibility, but also loyaltyloyalty to the chain, brand, etc.) is reflected. Rational decision-making elements may not always determine the popularity of a chain and the perceived ease of accessibility. Phan (2023) and Messner et al. (2020) point to the presence of irrational elements in consumer decision-making and loyalty, which may be based significantly on emotional or habitual factors rather than rational processes.

The fourth determinant is made up of only two factors, which are price and discount promotions. Price is generally considered a rational decision factor. The influence of pricing tools depends on the household income

level. Low-income households are more sensitive to price (Hough & Contarini, 2023), and from the distribution of households by income, we can expect these factors to continue to play a role. Colicchia et al. (2023) observed that low-income households are typically more interested in discount promotions. The representation of low-income households in society is a matter of social policy, how it is set, and how to treat these income groups within society.

The PLS-SEM structural modelling showed a significant effect of all determinants based on the factor analysis results on Real purchase sustainable behaviour. Environmental responsibility has the most significant influence, which is logical in the context of purchasing sustainable food and everyday products. Product Features significantly influence Real, sustainable purchasing behaviour. Price sensitivity has a weaker and negative impact on sustainable purchasing behaviour. Consequently, consumers who perceive price parameters as important do not move toward sustainable purchasing. Consumers are currently aware that they have to pay extra for sustainable products. In this case, shopping for sustainable products is not achievable for low-income households with no choice. The determinant of Comfort and Accessibility has the weakest influence on consumers' actual sustainable purchasing behaviour. It shows that consumers are likely to go the extra mile to purchase sustainable products, for example, buying from a retailer further away from their residence.

Among the newly formed determinants influencing consumer purchasing behaviour is the rise of interest in the sustainability impact of their consumption on the environment and greater interest in health. The results show that the environmental issues implemented by manufacturers and sellers of food and everyday products (pharmaceuticals and drugstores) are considered by customers when making purchasing decisions. Consumers are increasingly health-conscious, driving demand for health-related products. Personalised marketing, including tailored promotions, brand positioning, and recommendations, supports long-term loyalty. The results of the factor analysis and the results of the PLS-SEM modelling justify a slightly positive expectation, as the value hierarchy plays an increasingly important role in consumer behaviour. Instead of consumption being perceived only as the immediate satisfaction of a need and consumer decision-making being driven only by price, the importance of other significant determinants of consumer purchasing decisions is confirmed. The importance of life values entering consumer decision-making processes is underlined by research by Binder and Blankenberg (2017), explaining that consumption is related to personal satisfaction, which is determined by self-assessment of individual health, the environment in terms of relationships and the surrounding environment. Vitell (2015) also highlights consumer social responsibility, which is complementary to corporate social responsibility. Consumer social responsibility is significant because it involves moral principles and norms that guide behaviour in selecting, purchasing, using, and disposing of products or services.

References

Aguirre-Urreta, M. I., & Rönkkö, M. (2018). Statistical Inference with PLSc Using Bootstrap Confidence Intervals. *MIS Quarterly*, *42*(3), 1001–1020. https://doi.org/10.25300/misq/2018/13587

Ajzen, I. (2020). The theory of planned behavior: Frequently asked questions. *Human Behavior and Emerging Technologies*, *2*(4), 314–324. https://doi.org/10.1002/hbe2.195

Akkaya, M. (2021). Understanding the impacts of lifestyle segmentation & perceived value on brand purchase intention: An empirical study in different product categories. *European Research on Management and Business Economics*, *27*(3), 100155. https://doi.org/10.1016/j.iedeen.2021.100155

Arilla-Llorente, R., Gavurova, B., Rigelsky, M., & Ribeiro-Soriano, D. (2024). Quantifying the dynamics of relationships between eco-innovations and SDG 8. *Energy Economics*, *130*, 107280. https://doi.org/10.1016/j.eneco.2023.107280

Barker, M. E., Wong, F., Jones, C. R., & Russell, J. M. (2019). Food purchasing decisions and Environmental Ideology: An exploratory survey of UK shoppers. *Sustainability*, *11*(22), 6279. https://doi.org/10.3390/su11226279

Bhutto, M. Y., Soomro, Y. A., & Yang, H. (2022). Extending the theory of planned Behavior: Predicting young consumer purchase behavior of Energy-Efficient appliances (Evidence from Developing Economy). *SAGE Open*, *12*(1), 215824402210782. https://doi.org/10.1177/21582440221078289

Binder, M., & Blankenberg, A. (2017). Green lifestyles and subjective well-being: More about self-image than actual behavior? *Journal of Economic Behavior & Organization*, *137*, 304–323. https://doi.org/10.1016/j.jebo.2017.03.009

Bjørgen, A., Bjerkan, K. Y., & Hjelkrem, O. A. (2019). E-groceries: Sustainable last mile distribution in city planning. *Research in Transportation Economics*, *87*, 100805. https://doi.org/10.1016/j.retrec.2019.100805

Bosch, L., Yang, S., Hofste, D., Gibson, I., & Thiede, S. (2024). Performing a life cycle assessment for self-service devices: A case study of self-checkout. *Procedia CIRP*, *122*, 855–860. https://doi.org/10.1016/j.procir.2024.02.028

Boßow-Thies, S., Preuß, M., & Schwarz, J. (2021). Acceptance of unpackaged food products. *Journal of Food Products Marketing*, *27*(3), 127–141. https://doi.org/10.1080/10454446.2021.1912680

Brown, B. L., Hendrix, S. B., Hedges, D. W., & Smith, T. B. (2011). *Multivariate analysis for the biobehavioral and social sciences: A Graphical Approach*. John Wiley & Sons.

Bu, X., Nguyen, H. V., Chou, T. P., & Chen, C. (2020). A Comprehensive Model of Consumers' Perceptions, Attitudes and Behavioral Intention toward Organic Tea: Evidence from an Emerging Economy. *Sustainability*, *12*(16), 6619. https://doi.org/10.3390/su12166619

Coderoni, S., & Perito, M. A. (2019). Sustainable consumption in the circular economy. An analysis of consumers' purchase intentions for waste-to-value food. *Journal of Cleaner Production*, *252*, 119870. https://doi.org/10.1016/j.jclepro.2019.119870

Colicchia, C., Creazza, A., & Perotti, S. (2022). Better sustainability in the food supply chain through technology: a consumer perspective. *International Journal of Logistics Research and Applications*, *26*(11), 1435–1461. https://doi.org/10.1080/13675567.2022.2076816

De Canio, F. (2023). Consumer willingness to pay more for pro-environmental packages: The moderating role of familiarity. *Journal of Environmental Management*, *339*, 117828. https://doi.org/10.1016/j.jenvman.2023.117828

De Canio, F., & Martinelli, E. (2020). EU quality label vs organic food products: A multigroup structural equation modeling to assess consumers' intention to buy in light of sustainable motives. *Food Research International*, *139*, 109846. https://doi.org/10.1016/j.foodres.2020.109846

Diaconeasa, M., Popescu, G., Maehle, N., Nelgen, S., & Capitello, R. (2021). Media discourse on sustainable consumption in Europe. *Environmental Communication*, *16*(3), 352–370. https://doi.org/10.1080/17524032.2021.1999295

Diaz-Ruiz, R., Costa-Font, M., & Gil, J. M. (2017). Moving ahead from food-related behaviours: an alternative approach to understand household food waste generation. *Journal of Cleaner Production*, *172*, 1140–1151. https://doi.org/10.1016/j.jclepro.2017.10.148

Dorce, L. C., Da Silva, M. C., Mauad, J. R. C., De Faria Domingues, C. H., & Borges, J. a. R. (2021). Extending the theory of planned behavior to understand consumer purchase behavior for organic vegetables in Brazil: The role of perceived health benefits, perceived sustainability benefits and perceived price. *Food Quality and Preference*, *91*, 104191. https://doi.org/10.1016/j.foodqual.2021.104191

Eurostat. (2023). *European Union – Statistics on Income and Living Conditions*. Microdata. https://doi.org/10.2907/EUSILC2004-2022V1

Fernando, V., Abeysekara, N., Samarasinghe, G. D., & Kuruppu, G. N. (2017). The impact of green attributes on customer loyalty of supermarket outlets in Sri Lanka. *2017 Moratuwa Engineering Research Conference (MERCon)*, *9*, 395–400. https://doi.org/10.1109/mercon.2017.7980517

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. *Journal of Marketing Research*, *18*(1), 39–50. https://doi.org/10.1177/002224378101800104

Garson, G. D. (2022). *Factor analysis and dimension reduction in R*. https://doi.org/10.4324/9781003279693

Gavurova, B., Schonfeld, J., Bilan, Y., & Dudas, T. (2022). Study of the Differences in the Perception of the Use of the Principles of Corporate Social Responsibility in Micro, Small and Medium-Sized Enterprises in the V4 Countries. *Journal of Competitiveness*, *14*(2), 23–40. https://doi.org/10.7441/joc.2022.02.02

Skare, M., Gavurova, B., & Kovac, V. (2023). Investigation of selected key indicators of circular economy for implementation processes in sectorial dimensions. *Journal of Innovation & Knowledge*, *8*(4), 100421. https://doi.org/10.1016/j.jik.2023.100421

Skare, M., Gavurova, B., & Kovac, V. (2024). Sustainability of gender employment and pay gap types regarding female participation in corporate management. *Environment, Development and Sustainability*, 1-27. https://doi.org/10.1007/s10668-024-04753-9

Ge, H., Gómez, M. I., & Richards, T. J. (2024). The effect of price and assortment of local products on store performance: An agent-based modelling approach. *Journal of Agricultural Economics*, *75*(3), 981–1003. https://doi.org/10.1111/1477-9552.12612

González-Viralta, D., Veas-González, I., Egaña-Bruna, F., Vidal-Silva, C., Delgado-Bello, C., & Pezoa-Fuentes, C. (2023). Positive effects of green practices on the consumers' satisfaction, loyaltyloyalty, word-of-mouth, and willingness to pay. *Heliyon*, *9*(10), e20353. https://doi.org/10.1016/j.heliyon.2023.e20353

Govaerts, F., & Olsen, S. O. (2022). Consumers' values, attitudes and behaviours towards consuming seaweed food products: The effects of perceived naturalness, uniqueness, and behavioural control. *Food Research International*, *165*, 112417. https://doi.org/10.1016/j.foodres.2022.112417

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on Partial Least squares Structural Equation Modeling (PLS-SEM)*. Sage.

Hair, J. F., Jr, Hult, G. T. M., Ringle, C., & Sarstedt, M. (2016). *A primer on Partial Least squares Structural Equation Modeling (PLS-SEM)*. SAGE Publications, Incorporated.

Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2018). When to use and how to report the results of PLS-SEM. *European Business Review*, *31*(1), 2–24. https://doi.org/10.1108/ebr-11-2018-0203

Hair, J. F., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, *26*(2), 106–121. https://doi.org/10.1108/ebr-10-2013-0128

Hamid, M. R. A., Sami, W., & Sidek, M. H. M. (2017). Discriminant Validity Assessment: Use of Fornell & Larcker criterion versus HTMT Criterion. *Journal of Physics Conference Series*, *890*, 012163. https://doi.org/10.1088/1742-6596/890/1/012163

Harrison, M. R., Palma, G., Buendia, T., Bueno-Tarodo, M., Quell, D., & Hachem, F. (2022). A scoping review of Indicators for Sustainable Healthy Diets. *Frontiers in Sustainable Food Systems*, *5*. https://doi.org/10.3389/fsufs.2021.822263

Hazuchová, N., Stávková, J., Siedlecka, A., & Nagyová, Ľ. (2020). Current aspects of consumer behaviour in Central European countries. In *Contributions to management science* (pp. 3–30). https://doi.org/10.1007/978-3-030-47380-8_1

Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial Management & Data Systems*, *116*(1), 2–20. https://doi.org/10.1108/imds-09-2015-0382

Herrmann, C., Rhein, S., & Sträter, K. F. (2022). Consumers' sustainability-related perception of and willingness-to-pay for food packaging alternatives. *Resources Conservation and Recycling*, *181*, 106219. https://doi.org/10.1016/j.resconrec.2022.106219

Hough, G., & Contarini, A. (2023). Can low-income consumers choose food from sustainable production methods? *Current Opinion in Food Science*, *51*, 101035. https://doi.org/10.1016/j.cofs.2023.101035

Jadhav, H. B., Sablani, S., Gogate, P., Annapure, U., Casanova, F., Nayik, G. A., Alaskar, K., Sarwar, N., Raina, I. A., Ramniwas, S., & Khaneghah, A. M. (2023). Factors governing consumers buying behavior concerning nutraceutical product. *Food Science & Nutrition*, *11*(9), 4988–5003. https://doi.org/10.1002/fsn3.3518

Lavuri, R., Roubaud, D., & Grebinevych, O. (2023). Sustainable consumption behaviour: Mediating role of pro-environment self-identity, attitude, and moderation role of environmental protection emotion. *Journal of Environmental Management*, *347*, 119106. https://doi.org/10.1016/j.jenvman.2023.119106

Ma, J., & Kim, C. (2021). How does salespeople's personal interaction affect customers' word-of-mouth in retailing? *Journal of Asia Business Studies*, *16*(6), 833–849. https://doi.org/10.1108/jabs-03-2021-0112

Makowska, M., Boguszewski, R., & Hrehorowicz, A. (2024). Generational differences in food choices and consumer behaviors in the context of sustainable development. *Foods*, *13*(4), 521. https://doi.org/10.3390/foods13040521

Mattioli, G., & Anable, J. (2016). Gross polluters for food shopping travel: An activity-based typology. *Travel Behaviour and Society*, *6*, 19–31. https://doi.org/10.1016/j.tbs.2016.04.002

Messner, R., Richards, C., & Johnson, H. (2020). The "Prevention Paradox": food waste prevention and the quandary of systemic surplus production. *Agriculture and Human Values*, *37*(3), 805–817. https://doi.org/10.1007/s10460-019-10014-7

Moore, S., Bulmer, S., & Elms, J. (2021). The social significance of AI in retail on customer experience and shopping practices. *Journal of Retailing and Consumer Services*, *64*, 102755. https://doi.org/10.1016/j.jretconser.2021.102755

Moschis, G. P., Mathur, A., & Shannon, R. (2020). Toward Achieving Sustainable Food Consumption: Insights from the Life Course Paradigm. *Sustainability*, *12*(13), 5359. https://doi.org/10.3390/su12135359

Olsson, J., Osman, M. C., Hellström, D., & Vakulenko, Y. (2021). Customer expectations of unattended grocery delivery services: mapping forms and determinants. *International Journal of Retail & Distribution Management*, *50*(13), 1–16. https://doi.org/10.1108/ijrdm-07-2020-0273

Otto, S., Strenger, M., Maier-Nöth, A., & Schmid, M. (2021). Food packaging and sustainability – Consumer perception vs. correlated scientific facts: A review. *Journal of Cleaner Production*, *298*, 126733. https://doi.org/10.1016/j.jclepro.2021.126733

Paço, A. D., Shiel, C., & Alves, H. (2018). A new model for testing green consumer behaviour. *Journal of Cleaner Production*, *207*, 998–1006. https://doi.org/10.1016/j.jclepro.2018.10.105

Pan, S., Liang, Z., & Chen, Q. (2019). When will car owners abandon car driving? Analysis based on a survey of the parking experiences of people in Changsha, China. *International Journal of Modern Physics B*, *33*(15), 1950148. https://doi.org/10.1142/s0217979219501480

Petrescu, D. C., Vermeir, I., & Petrescu-Mag, R. M. (2019). Consumer Understanding of food quality, Healthiness, and Environmental Impact: A Cross-National Perspective. *International Journal of Environmental Research and Public Health*, *17*(1), 169. https://doi.org/10.3390/ijerph17010169

Phan, T. X. D. (2023). Understanding the acquisition, usage, and disposal behaviours in sustainable food consumption: A framework for future studies. *Cleaner and Responsible Consumption*, *12*, 100162. https://doi.org/10.1016/j.clrc.2023.100162

Potter, C., Bastounis, A., Hartmann-Boyce, J., Stewart, C., Frie, K., Tudor, K., Bianchi, F., Cartwright, E., Cook, B., Rayner, M., & Jebb, S. A. (2021). The Effects of Environmental Sustainability Labels on selection, purchase, and consumption of food and drink products: a Systematic review. *Environment and Behavior*, *53*(8), 891–925. https://doi.org/10.1177/0013916521995473

Purvis, B., Mao, Y., & Robinson, D. (2018). Three pillars of sustainability: in search of conceptual origins. *Sustainability Science*, *14*(3), 681–695. https://doi.org/10.1007/s11625-018-0627-5

Ran, Y., Lewis, A. N., Dawkins, E., Grah, R., Vanhuyse, F., Engström, E., & Lambe, F. (2022). Information as an enabler of sustainable food choices: A behavioural approach to understanding consumer decision-making. *Sustainable Production and Consumption*, *31*, 642–656. https://doi.org/10.1016/j.spc.2022.03.026

Shehawy, Y. M., & Khan, S. M. F. A. (2024). Consumer readiness for green consumption: The role of green awareness as a moderator of the relationship between green attitudes and purchase intentions. *Journal of Retailing and Consumer Services*, *78*, 103739. https://doi.org/10.1016/j.jretconser.2024.103739

Soorani, F., & Ahmadvand, M. (2019). Determinants of consumers' food management behavior: Applying and extending the theory of planned behavior. *Waste Management*, *98*, 151–159. https://doi.org/10.1016/j.wasman.2019.08.025

Thøgersen, J., Pedersen, S., & Aschemann-Witzel, J. (2018). The impact of organic certification and country of origin on consumer food choice in developed and emerging economies. *Food Quality and Preference*, *72*, 10–30. https://doi.org/10.1016/j.foodqual.2018.09.003

United Nations. (2024). *Goal 12, Ensure sustainable consumption and production patterns*. UN, Department of Economic and Social Affairs. Retrieved October 18, 2024, from https://sdgs.un.org/goals/goal12

Vitell, S. J. (2014). A case for Consumer Social Responsibility (CNSR): including a selected review of Consumer Ethics/Social Responsibility Research. *Journal of Business Ethics*, *130*(4), 767–774. https://doi.org/10.1007/s10551-014-2110-2

Waldman, K. B., Giroux, S., Blekking, J. P., Nix, E., Fobi, D., Farmer, J., & Todd, P. M. (2022). Eating sustainably: Conviction or convenience? *Appetite*, *180*, 106335. https://doi.org/10.1016/j.appet.2022.106335

Zámková, M., Rojík, S., Prokop, M., Činčalová, S., & Stolín, R. (2022). Czech Consumers' Preference for Organic Products in Online Grocery Stores during the COVID-19 Pandemic. *International Journal of Environmental Research and Public Health*, *19*(20), 13316. https://doi.org/10.3390/ijerph192013316

Zeybek, Ö., & Ülengin, B. (2021). The effect of sales promotions intensity on volume and variability in category sales of large retailers. *Journal of Marketing Analytics*, *10*(1), 19–29. https://doi.org/10.1057/s41270-021-00121-y

Funding: This research was funded by the grant No. IGA-PEF-TP-23-012 of the Grant Agency of the Faculty of Business and Economics at Mendel University in Brno and by the project CZ.02.1.01/0.0/0.0/16_017/0002334 Research Infrastructure for Young Scientists, co-financed by Operational Programme Research, Development and Education.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/s6343526349

Data Availability Statement: More information and data more information and data on request by e-mail.

Author Contributions: Conceptualisation: *IB, MP*; methodology: *JS, IB*; data analysis: *IB, MP, VŠ, writing*—original draft preparation: *IB, MP, JS, VŠ*, writing; review and editing: *IB, MP, JS*; visualisation: *MP*. All authors have read and agreed to the published version of the manuscript.

Irena BALÁKOVÁ is the academic staff at the Department of Marketing and Trade, Faculty of Business and Economics, Mendel University in Brno. Brno, Czech Republic. Research interests: sustainable consumer behavior, environmental competences of consumers, quantitative methods in marketing research.
ORCID ID: https://orcid.org/0000-0002-4331-4187

Michal PŠURNÝ is the early academic researcher (postdoctoral researcher) at the Department of Marketing and Trade, Faculty of Business and Economics, Mendel University in Brno, Brno, Czech Republic. Research interests: consumer behavior, online marketing, models of consumer behavior, neuromarketing tools, sustainable consumption.
ORCID ID: https://orcid.org/0000-0001-5368-0714

Jana STÁVKOVÁ is the Professor at the Department of Marketing and Trade, Faculty of Business and Economics, Mendel University in Brno, Brno, Czech Republic. Research interests: application of mathematical and statistical methods with a focus on consumer behavior. Models of consumer behavior, changes in consumption behavior that are related to changes in development in society, and sustainability.
ORCID ID: https://orcid.org/0000-0002-0889-0218

Veronika ŠVECOVÁ is a graduate and junior researcher at the Faculty of Business and Economics at Mendel University in Brno, Brno, Czech Republic. Research interests: sustainability and digitalisation in consumer behavior.
ORCID ID: https://orcid.org/0009-0002-8103-1687

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

Publisher
http://jssidoi.org/esc/home

MANAGERIAL CONCEPTUALISATION OF COMPETITIVE ADVANTAGE

Horymír Kalmus [1], Marek Vochozka [2], Jarmila Straková [3]

[1] Pan-European University, Spálená 76/14, 110 00 Prague, Czech Republic
[2,3] Institute of Technology and Business in České Budějovice, Okružní 517/10, 370 01 České Budějovice, Czech Republic

E-mails: [1] horymirkalmus@volny.cz; [2] vochozka@mail.vstecb.cz; [3] strakova@mail.vstecb.cz

Received 11 August 2024; accepted 23 November 2024; published 30 December 2024

Abstract. This paper aimed to fill the gap in the managerial conception of competitive advantage by identifying and describing the specific sources that enable the firm to achieve higher economic value. These resources are rarely treated consciously in practice but more often subconsciously, intuitively, or just based on long-standing best practices. The article focused on structuring, classifying, and naming specific sources of competitive advantage and linking them to managerial frameworks, theories, and concepts from the field of strategic management that are categorised according to the same or similar behavioural characteristics. At the same time, the paper outlines the linkages between sources of competitive advantage, corporate strategy, value chain, and sustainability of competitive advantage. The research method of bibliometric analysis used revealed the interrelationships between the concept of "competitive advantage" and "key characterising keywords", and 9 clusters represented by the most frequent keywords were formed. By their descriptive sentence interpretation, the clusters were then classified under commonly known strategic frameworks and concepts, which differ from each other but represent well-known and understandable theories with clear generic characteristics, specific manifestations, and uniform and consistent characteristics. Within these, the authors then extract 135 prominent sources of competitive advantage where, by looking back at their roots and origins, managers can come to a clearer understanding of the theoretical area or framework that relates to their own achieved or potentially achievable competitive advantage. A deeper understanding of these strategic components enables managers to stimulate new ideas and innovations and significantly contribute to creating new and previously undiscovered competitive advantages.

Keywords: strategic management; competitive advantage; sources of competitive advantage; value chain

Reference to this paper should be made as follows: Kalmus, H., Vochozka, M., Straková, J. 2024. Managerial conceptualisation of Competitive advantage. *Entrepreneurship and Sustainability Issues*, 12(2), 378-399. http://doi.org/10.9770/a5295986656

JEL Classifications: A10, L10, L20

1. Introduction

In the context of accelerating global, technological, and market changes, the ability of corporations to compete and gain competitive advantage is becoming increasingly crucial. The fundamental premise of competition remains to outperform rivals in the market environment (Gavurova et al., 2016, 2017).

Mohamed a Başar (2023) described that firms achieve competitive advantage by creating and delivering more economic value than their competitors, and they capture part of this value in the form of profits. Exploring why some firms outperform others remains an unanswered primary focus of strategic management research (Keskin et al., 2021).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

A historical breakthrough in the understanding of competitive advantage occurred in the 1980s with the seminal work of Michael Porter, which focused on developing theories of competitive strategies and the concept of competitive advantage. Porter views competition as the primary effort of firms to achieve higher profitability than their direct rivals. This traditional conception of competitive advantage is that a firm either seeks lower costs than competitors, provides higher perceived value to customers, or achieves a combination of both. Porter characterises competitive advantage as follows, "There are two basic types of competitive advantage: cost leadership and differentiation" (Porter, 1985).

In the later studies, Porter (1991) emphasises the greater complexity of the issue. He discusses the so-called "dynamic theory of strategy", which identifies three possible ways of determining the origins of competitive advantage: by modelling relevant variables and environments (e.g. technology, products, preferences), by committing to a limited number of irreversible investment decisions, and by using resources, including core competencies, as opportunities for diversification.

In the following years, many concepts and theoretical studies on competitive advantage were developed. From these, three main streams of thought have gradually emerged that examine and measure competitive advantage in terms of firms' superior performance, firm resources, and the firm's ability to effectively exploit market opportunities and/or neutralise competitive threats (Deszczyński, 2021; Grant, 2022; Waseem et al., 2023).

These streams often characterise the sources of competitive advantage, although they are not always explicitly named and unveiled.

Some authors use case studies to show that competitive advantage is not necessarily associated with superior performance, yet firms can have this advantage (Baia et al., 2020; Farida & Setiawan, 2022a). Cao et al. (2022) or Lin et al. (2020) then argue that competitive advantage is more dependent on specific conditions and contexts, i.e., that it is contextually contingent.

Chikán et al. (2022) describe competitive advantage as a relational concept between a specific firm and its rivals within a specific context of competition. According to this theory, competitive advantage is not a universal, general, and overall characteristic of a firm or certain aspect of a firm.

The concept of competitive advantage has a significant variety and diversity of content. Since different authors conceive and interpret it differently, it needs an unambiguous definition and suffers from the so-called definition problem (Dixit et al., 2021).

Competitive advantage and its sources are readily apparent in firms that have achieved it, and it has usually been created over a long time horizon (Sołoducho-Pelc & Sulich, 2020; Gavurova et al., 2020). Less often, competitive advantage is deliberately built from the beginning of a company's life cycle. Most of the literature, therefore, focuses on "ex-post" case studies that use specific examples to show the impact of specific competitive advantages on firm performance or profitability (Miocevic, 2021; Tkacova & Gavurova, 2023).

In today's business environment, there is a strong emphasis on speed, agility, and the ability to adapt quickly. The need for continuous adjustment of strategies has been addressed by Ali and Anwar (2021), who rightly argue that strategic plans cannot be implemented accurately over the long term as new information and external stimuli continuously enter into them. For this reason, the intended and planned strategy often differs from the one that is eventually implemented. This approach has a major impact on the construction and behavioural characteristics of competitive advantage, the key attributes of which are longevity, strength, and sustainability. Naradda Gamage et al. (2020) add that these global challenges and trends that define the current business environment increasingly impact local markets. According to Zakhidov (2024), this impact forces firms to constantly adapt their strategies and reassess the impact, relevance, and sustainability of their existing competitive advantage.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

Concerning the future of strategic management Benito et al. (2022) predict that multinational managers will face three key challenges in the strategic direction of firms: climate change, the development of artificial intelligence (AI), and geopolitical influences. Many other studies focus on the issue of strategic business model innovation (BMI) to ensure firms' long-term prosperity. Empirical research Dymitrowský a Mielcark (2021) has shown that BMI based on new technologies positively affects a firm's competitive advantage, suggesting that in the future, strategic innovations associated with technological advances will be increasingly crucial for long-term market success.

Although competitive advantage is of high strategic importance and, in its more general concept, predetermines the success of a company on the market, active and conscious work with competitive advantage is rarely seen in managerial practice, and often competitive advantage is perceived by managers only superficially and rather more intuitively.

Research Sigalas (2015) found that almost 42% of managers cannot identify the existence of competitive advantage in their organisation, indicating that they are unfamiliar with the concept. Understanding competitive advantage requires significant mental effort, analytical understanding, and deep insight from managers. However, few managers are willing to accept extensive scientific theories and concepts (Belas et al. 2022; Gavurova et al. 2022). Managers are usually very busy and often expect clear and direct outputs from research (Abernethy et al., 2024). Mahrinasari et al. (2021) further confirmed that managers prefer practical guidelines for dealing with organisational situations, which increases their propensity to make intuitive decisions instead of deeper analysis.

There is a gap in managerial understanding of competitive advantage, particularly its sources and clearer characteristics, both in terms of theoretical, more accurate, and clearer descriptions and practical understanding. There is a lack of a structured, logical, and comprehensible interpretation of the sources of competitive advantage, including a description of their characteristics and attributes, with an emphasis on their resilience and sustainability over time, as well as their embedding in the context of corporate functions and value creation processes. This gap often leads companies to fail to exploit their full potential, lose their market position, and jeopardise their long-term competitiveness.

This paper aims to fill the gap in the managerial conception of competitive advantage and to identify and describe certain sources of competitive advantage that enable a firm to achieve higher economic value. These resources are usually rarely treated consciously in practice but more often subconsciously, intuitively, or only based on long-standing best practices. The paper focuses on structuring, classifying, and naming specific sources of competitive advantage, links them to managerial frameworks, theories, and concepts from the field of strategic management, and explores their interrelated behavioural characteristics. At the same time, the paper reveals the links between sources of competitive advantage, corporate strategy, value chain, and sustainability of competitive advantage.

2. Research Design and Methodology

The research design of this paper is domain theory (Lukka & Vinnari, 2014), which addresses a specific set of knowledge about a subtopic domain. Through deductive reasoning (Walliman, 2011) and synthesis of multiple theories, a graphical model (Jaakkola, 2020) is chosen as the output of the paper for discussion, which represents the topic under investigation and clarifies the interrelationships between the constructs.

Clustering

The main inputs examined are sources of competitive advantage, which need to be structured appropriately. Using the bibliometric analysis method in the Web of Science database, all 4,163 articles containing the keyword "competitive advantage" in the main line and adding the auxiliary keyword "source" were selected. Their titles and abstracts were then exported to separate files. Subsequently, they were sorted into 9 clusters using the advanced software tool VOSviewer version 1.6.19, Figure 1. Primarily, the links between the term

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

"competitive advantage" itself and the "main characterising phrases" were examined. In each cluster, 10 keywords were selected with their highest rate of occurrence. By their subsequent descriptive sentence interpretation, the clusters were classified under commonly known managerial frameworks, theories, and concepts, representing comprehensible theories with clear generic properties, specific manifestations, and uniform and consistent characteristics. For each strategic framework or concept, the authors then derived 15 prominent sources of competitive advantage, i.e. a total of 135 sources for all clusters, where a retrospective look at their roots and origins can lead to a clearer understanding of that particular theoretical area or framework related to competitive advantage.

Output Exhibition in a Table

The result of the clustering is reported in the Appendix of this article. The first column, titled "Cluster", indicates the cluster serial number.

The second column, titled "Number of Items", expresses the total number of items obtained by clustering using the software tool VOSviewer.

In the third column, titled "10 keyword representatives with the highest occurrence rate in Cluster (No of occurrence)", the keywords with the highest number of occurrences are mentioned, and the explicit numbers are given in parentheses.

The fourth column, titled "Descriptive perception of the cluster supporting the quest for the source of competitive advantage", expresses a concise perceived sentence expression deductively derived from the keyword content.
According to this descriptive characteristic of each cluster, the managerial frameworks, theories, and concepts that fit the cluster and its descriptive perception are again deductively identified in the fifth column titled "Derived managerial frameworks, theories and concepts that fit the cluster and its descriptive perception".
In the last column, titled "Prominent representatives of the sources of competitive advantage that fit derived managerial frameworks, theories, and concepts", 15 prominent representatives of specific sources of competitive advantage are derived for each managerial framework, theory, or concept, i.e., a total of 135 such representatives are identified across all clusters.

3. Results

Using the VOSviewer software tool allowed us to create 9 clusters and identify the links and relationships between the words "competitive advantage" and "main characterising links", Figure 1. Each cluster contains the most frequently searched keywords with the highest number of occurrences. Using the described methodology, the authors derived links between the retrieved keywords and managerial frameworks, theories, and concepts. From these, 15 prominent sources of competitive advantage are then derived, i.e. a total of 135 sources of competitive advantage to all clusters.

The observed clustering outputs and subsequent derivations are summarised in the Appendix of this paper.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

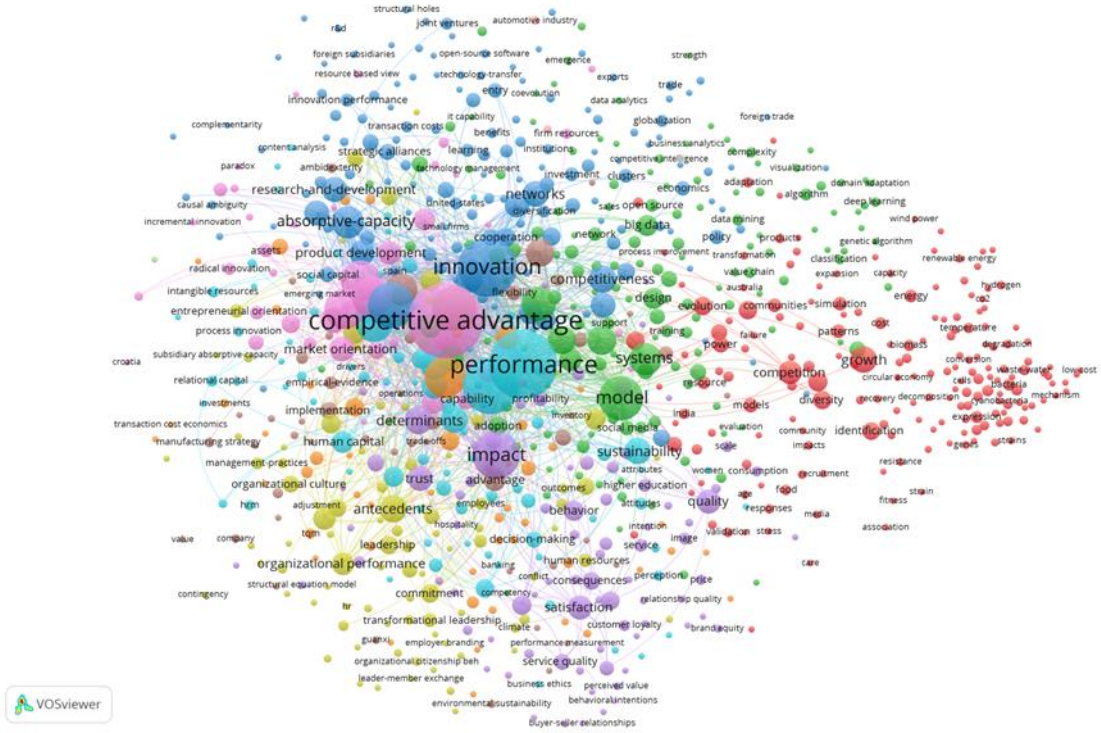


Figure 1. VOSviewer clustering of the word links between “competitive advantage" itself and the "main characterising phrases"

Sources of Competitive Advantage

Each of the resulting clusters is assigned individual management frameworks, theories, and concepts, which are briefly described below. The specific sources of competitive advantage whose prominent representatives belong to the respective framework, theory, or concept are examined.

These extracted individual prominent representatives of sources of competitive advantage overlap, repeat, or even complement each other in some interpretative dimensions and characteristics across some managerial frameworks, theories, or concepts. Nevertheless, it is possible to find common roots, generic characteristics, and/or a distinct theoretical basis for them.

Cluster 1 - Strategic Positioning and Business Model

Strategic positioning is usually determined by the company itself based on a thorough strategic analysis of the sector and available resources. The original concept of the three generic strategies of cost leadership, differentiation and focus (Porter, 2004) has been modified and extended by many scholars to a combined concept of eight elements according to Moon et al. (2014): Broad differentiation, Broad cost leadership, Product-based differentiation, Product-based cost leadership, Customer-based differentiation, Customer-based cost leadership, Narrow differentiation, Narrow cost. This represents considerable diversity and the need for a deeper understanding of each concept and its differences or overlaps.

Through appropriate strategic positioning, a company seeks to position itself in a market that will be difficult for competitors to copy and will create a competitive advantage in the long term.

Similarly, efforts to position the company more advantageously on the market can be observed, e.g. in the business model innovation (BMI) (Bashir & Verma, 2017), its sustainability and the dynamic capabilities of the firm associated with organisational design (Bocken & Geradts, 2020a), in the business model's connection to value creation that changes over time and requires changes in organisational design (Fjeldstad & Snow, 2018),

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

in the unique flat organisational structure (Alexy, 2022), in the unique revenue model (Grant, 2022), that the firm applies, etc.

Thus, the chosen strategic positioning or the chosen business model predetermines the attributes and characteristics of the competitive advantage through which the firm wants to gain and maintain its position in the market, or rather the other way around, the competitive advantage is based on a specific conscious configuration of resources through which the firm wants to create value and outmanoeuvre the competition.

Cluster 2 - Core Competences

Core competencies are the resources and capabilities that form the strategic advantages of a company. A company defines what it wants to be better at than its competitors, why, and how it will develop it to create a competitive advantage. Based on this, the firm should make capital investments and process changes to be able to develop unique core competencies.

The managerial theory of core competencies is characterised as the aligned outcome of a specific set of skills or production techniques that differentiate a firm in the marketplace and form the basis of competitiveness, Prahalad and Hamel (1990). This study illustrates that core competencies are developed through continuous improvement, which leads to the development of key products that can be further leveraged to create many more products for end users. The authors define core competencies as "collective learning across the corporation". In the concept of competitive advantage, core competencies are then related to the creation of superior value or some advantage for consumers, and these competencies should be difficult to imitate or replicate or should be rare.

Tampoe (1994) develops the theory of core competencies of an organisation and defines it as "a technical or managerial subsystem that provides a sustainable and unique competitive advantage and adds value to an organisation".

Global competition and dynamic changes in markets and customer behaviour pressure companies to identify their core competencies to develop their capabilities and adapt to changing environments and technological developments. Using a research approach in the form of a dependency structure matrix, the authors provide a management tool to help firms identify Core Competencies based on identifying Core Products (Danilovic & Leisner, 2007).

The difficulty of correctly identifying core competencies is also suggested by other research, which indicates that managers apply them rather intuitively. Research by Eden and Ackermann (2010) reinforces the view that firm differentiation is most strongly manifested in identifying and creating unique bundles or combinations of competencies and capabilities.

Current research shows that the rapid development of technology and digitalisation significantly impacts human resources' core competencies and skills and induces a significant need to adapt them to the coming Industry 5.0 development stage (Suciu et al., 2023).

Cluster 3 - Innovation and Knowledge Capability

Innovation is the creation of new products or processes by developing new knowledge or new combinations of existing knowledge. In economics and business, innovation is one of the most important sources of competitive advantage. The economist Joseph Schumpeter is considered one of the founders of innovation management, who, in his landmark work (Schumpeter, 1994), says that industry must continuously improve its economic structure, which means streamlining processes and improving products.

The broad innovation literature has evolutionarily shifted from a primary focus on product innovation to the identification and importance of the roles of other forms of innovation in value creation. The OECD Manual

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

(2005) in its third edition distinguishes two types of innovation, (a) technological - product and process, and (b) non-technological - marketing and organisational. The fourth edition of the OECD Manual (2018) then adds to the terminology the concept of Business innovation as a new or improved product or business process or a combination of both, which differs significantly from the previous one.

A revolutionary concept in the field of innovation management has become the theory of disruptive innovation (Christensen, 2008), where minority players create a new market and a new value network at the periphery of the existing market, which is overlooked and ignored by the incumbents, but which in its innovative development eventually overcomes existing products and strong alliances and pushes established firms out of their positions.

The biggest innovative technological driver of today and the near future is Artificial Intelligence (AI). Its application will touch almost every field, with the EU Parliament document (2020) outlining the frameworks that shape the regulatory and economic context for AI, describing the possibilities for AI development and use, and mentioning the social and ethical options that focus on the relationship between AI and society.

In AI application in strategic management, AI's low cognitive capabilities in creating winning competitive strategies are often discussed. A study by Krakowski et al. (2022) demonstrates that while AI can outperform humans in some cognitive tasks, the complete replacement of the human agent by a machine is impossible. Therefore, the best winning combination is the operation of the human agent simultaneously with AI. The main reason for the unsuitability of AI to "strategically manage" is the high complexity of the business environment, where AI lacks the capacity for creativity, contextual understanding, and social communication.

Kemp (2023) argues that AI can provide a competitive advantage if three characteristics of AI can be overcome in the ways suggested - its nature as a generic technology can be removed in the form of "grounding", its dependence on the explicit articulation of knowledge in the form of "bounding", and its tendency to be "myopic" due to a lack of contextual awareness in the form of "reframing".

Although innovation has great potential to create a competitive advantage, research shows that firms' innovation efforts often fail, and newly introduced innovations are often not sustainable in the long term. Pisano (2015) offers guidance by creating evolutionary innovation strategies on how innovations should create value for customers, how firms should capture this value, and what types of innovations firms should pursue.

Cluster 4 - Organisational Capabilities and HR Management

Organisational capabilities are the intangible strategic assets an organisation uses to be effective, execute its business strategy, and satisfy its customers. They may include expertise, activities, information, procedures, processes, skills, systems, technologies, or unique adaptive characteristics. The strength and consistency of these assets define a company's identity and can create a competitive advantage.

Although traditional ways of gaining competitive advantage are like a firm's financial, strategic, and technological capabilities, organisational capabilities are based on the assumption that people perform decision-making processes and all organisational activities (Ulrich & Lake, 1991).

Spanos & Practacos (2004) generally conceptualises organisational capabilities theory as socially constructed entities organised into knowledge networks that carry relationships between individuals and inanimate corporate assets to perform assigned tasks efficiently and effectively.

Today, the focus on human potential and its skills is often associated with digital skills, the effective use of which can create a competitive advantage for an organisation. Van Laar et al. (2017) define a conceptual framework of knowledge worker skills in the 21st century in relation to the digital environment, which consists of a framework of seven core skills: technical, information management, communication, collaboration,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

creativity, critical thinking, and problem-solving, and five contextual skills, which are: ethical awareness, cultural awareness, flexibility, self-direction, and lifelong learning.

With the massive emergence of AI into mainstream business practice, many scholars are beginning to address the necessary organisation and new demands on corporate management and organisational capabilities to use AI technologies. Weber et al. (2023) identified four organisational capabilities facilitating AI implementation: AI Project Planning, Co-Development of AI systems, Data Management, and AI Model Lifecycle Management.

The use of this knowledge in practice can serve to arrange organisational resources accordingly and to make strategic decisions. These knowledge capabilities, particularly in the IT field, can become a significant source of competitive advantage.

Cluster 5 - Relationship and Network Effects

The term relationships and network effects can be characterised by referring to any situation where the value of a product, service, or platform depends on the number of buyers, sellers, or users who use it. Typically, the greater the number of buyers, sellers, or users, the greater the network effect - and the greater the value the offering creates.

This is often the case in online environments with large target reach, such as e-commerce, social networks, user-centric platforms, sharing economy services, etc. However, it can also be relationships in the supply model or network effects in specific business ecosystems.

These relationships and their strength and robustness can create a significant competitive advantage and are often difficult for competitors to imitate.

Examples from the technology environment show that forming alliance networks to pursue a particular technology standard can eliminate rivals by creating interconnected solid supplier relationships and gaining a significant competitive advantage (Soh, 2010).

The conditions under which they operate most effectively are critical to creating business networks and relationships. Saskia De Klerk (2012) identifies that the fundamental prerequisite and cornerstone within network relationships is “trust“.

Lin & Lin (2016) link network relationships to their sources as network content. They then classify and differentiate these into four types of relationships: long- and short-term, team-based, and project-based. According to these, they then determine their impact on performance and advantage for the firm.

A special category in the creation of network relationships in the platform ecosystem is third-party complementors, which are becoming a very attractive market segment. Stronger alliances between platform vendors and complementor vendors can create effective strategic dynamic decision frameworks in the network ecosystem (Cenamor, 2021).

Using the example of the Chinese Internet giant Tencent operating a platform-based entrepreneurial firm (PBEF), Zeng et al. (2023) demonstrate the critical ability to exploit the network effect in firm growth. The three defined resource management patterns focus on the key objectives, which are: a) structuring the platform portfolio - initiating network effect for mass user acquisition, b) developing resource pool - expanding the network to create new opportunities, external resources, complements, and data, c) sustaining ecosystem development - focusing on creating a self-managing ecosystem that enables growth.

It is clear that the relationships and network effects created in this era of increasing advanced digitalisation and near-barrier-free communication enable the emergence of a very significant or even global competitive advantage.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

Cluster 6 - Management and Entrepreneurship

In a broader sense, management and entrepreneurship can be defined as the ability to seize opportunities and ideas and create value for others. From the perspective of sources of competitive advantage, it is then usually about exceptional management skills and/or strong entrepreneurial thinking of an individual or an entire organisation.

Despite its broad complexity, ambiguity of opinion, and lack of clear terminology, entrepreneurial orientation has become one of the most studied constructs in the modern entrepreneurship and management literature. Earlier studies measured entrepreneurial orientation using three dimensions: innovativeness, pro-activeness, and risk-taking (Miller, 1983). These dimensions were later expanded to include two additional dimensions: autonomy and competitive aggressiveness (Lumpkin & Dess, 1996).

Entrepreneurial orientation is most often used in the context of two different phenomena. As a unidimensional construct of entrepreneurship understood as risk-taking, innovativeness, and pro-activeness, and as a multidimensional construct related to the processes, practices, and decision-making activities that lead to new entrants (Covin & Wales, 2019).

In examining successful firms in terms of exceptional managerial and entrepreneurial skills, research has begun to explore the area of entrepreneurial mindset to answer why some people identify opportunities and others do not. Naumann (2017) links the term Entrepreneurial mindset to a cognitive mindset comprising seven attributes divided into two groups. The first is the Core attributes, which directly influence the presented human behaviour and are observable from the outside: cognitive tuning & goal orientation, heuristic-based decision logic, alertness, prior knowledge, and social interaction. The second group is Meta-cognitive attributes, which require a higher level of self-awareness and are more hidden: meta-cognition and cognitive adaptability.

Thus, managerial and entrepreneurial success is primarily attributed to the behavioural and entrepreneurial mindsets associated with the triad of “The cognitive aspect (Thinking)“ - how entrepreneurs use mental models to think, “The behavioural aspect (Acting)" - how entrepreneurs respond to opportunity and “The emotional aspects (Feeling)“ - what entrepreneurs feel in business (Kuratko et al., 2021).

One of the most famous concepts of successful entrepreneurial thinking that completely changes the view of the competitive market environment and creates a unique sovereign market space is the well-known Blue Ocean Strategy (Kim & Mauborgne, 2005), i.e. a space without direct significant competition

The emphasis on human capabilities and entrepreneurship is also defined by the EntreComp European framework for promoting entrepreneurial capabilities and entrepreneurial competencies (Bacigalupo et al., 2016), which consists of three interrelated and interconnected competency areas: "Ideas and Opportunities", "Resources" and "Into Action". Within these, 15 competencies emerge, which together constitute the entrepreneurial mindset. These include, for example, creativity, planning and management, taking initiative, learning through experience, mobilising resources, and others. These competencies can be mapped from basic to expert level, so the framework applies to all competencies.

Cluster 7- Knowledge-Based View

The knowledge-based view (KBV) is considered a derivative of the Resource-Based View (RBV) theory and extends the portfolio of corporate resources to include knowledge-based resources. This theory considers knowledge a fundamentally necessary, scarce, and valuable resource in a firm (Grant, 1996).

Knowledge-based resources and firm-specific knowledge are developed primarily within or across firm boundaries and are difficult for competitors to imitate or copy. This provides the basis for sustainable competitive differentiation. The KBV thus establishes that the heterogeneous knowledge base and capabilities,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

as intangible assets of the firm, are the main determinants of firm performance in a knowledge economy Eisenhardt et al. (2000).

The ownership of knowledge-based resources and intellectual capital is essential to a firm's success in a dynamic business environment (Kengatharan, 2019). These resources contribute to cost reduction, foster innovation and creativity, increase efficiency, and benefit customers, and are considered key drivers of overall firm performance.

A key aspect of knowledge creation and innovation is the firm's ability to absorb external knowledge - the so-called absorptive capacity, which is characterised by the ability to identify, receive and use knowledge sources from the environment Ferreira et al. (2020).

Broad conceptualisation research identifies that KBV has a growth trend and potential in social capital, corporate social responsibility, process and product information, and intellectual capital development (Pereira & Bamel, 2021).

With increasing demands in digitalisation, the RBV view is extended to the need to create corporate ecosystems that integrate elements of internal and external knowledge management and support business growth (Chen et al., 2023).

Cluster 8 - Dynamic Capabilities

In today's business world, which is often referred to as a VUCA environment (Volatile, Uncertain, Complex, and Ambiguous), companies must be able to adapt quickly and effectively to market or technological changes. Dynamic Capabilities (DC) of the firm originated as a derivative of the Resource-Based View (RBV) concept and is one of the most discussed theoretical frameworks in the competitive research field today.

Dynamic capability is a process, position, and path-focused framework initially defined as a firm's ability to integrate, build, and reconfigure internal and external competencies to respond to a rapidly changing environment (Teece et al., 1997).

The original theoretical concept of DC has been widely developed and is characterised as a set of specific and identifiable processes, which are product development, strategic decision-making, and alliance formation (Eisenhardt & Martin, 2000).

The DC concept has been revised and modified by its original author over time to take the form of three core high-level corporate capabilities: sensing, seizing, and transforming (Teece, 2007). These are key activities for companies and their management in identifying where markets and technologies are heading, figuring out how to capitalise on this, and finally reshaping and transforming company resources to fulfil and capitalise on the new vision.

Dynamic capabilities allow firms to identify profitable configurations of competencies and assets, assemble and organise them, and then leverage them in an innovative and agile organisation (Schoemaker et al., 2018). What excels here is the ability of flexible functions that can be combined in one way at first and reconfigured into other combinations later.

The dynamic capabilities of the business require agility in rapid decision-making, and strategy is very closely linked to making sense and being effective. Only when everything is well connected and interacting can value be created and the concept of a sustainable business model be established (Bocken & Geradts, 2020)

Companies need the ability to capture and create value in this way to develop and maintain a competitive advantage over their existing and potential rivals.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

Teece (2023) actively embeds the concept of DCs in the contemporary modern economic theory of the firm and outlines the possibilities of using them as a policy tool for industrialised economies.

Cluster 9 - Resource-Based View

The resource-based view (RBV) is one of the most important conceptual frameworks for understanding the sources of sustainable competitive advantage. The study by Wernerfelt (1984), which can be considered the beginning of this conceptual framework, focused on the analysis and positioning of firm resources instead of product analysis.

K The concept was further developed by assuming that strategic resources are heterogeneously distributed among firms and are stable (Barney, 1991). In exploring the link between firm resources and competitive advantage, the author listed four key attributes of resources that can lead to competitive advantage: value, rarity, imitability, and organisation; nowadays, the concept is referred to as VRIO. Resources and capabilities are then further divided into tangible (physical, financial, technological, organisational) and intangible (human, innovation, reputation), with competitive advantage arising from their heterogeneity and immobility (Madhani, 2010).

Some authors consider the RBV concept a "research agenda" or "metatheory", involving a basic view of their heterogeneity and imperfect mobility. The theory attempts to explain or predict various outcomes through additional assumptions, analyses, or logic (Miller, 2019).

Many authors develop the concept of RBV by looking at their management in adding new dimensions to asset management and exploring orchestrating the impact and linkages of these strategic resources and activities on firm performance (D'Oria et al., 2021).

The RBV concept is being expanded into greater complexity and interconnectedness with other strategic management theories, such as linking with stakeholder theory incorporating four essential elements from this theory: (a) incorporating normativity, (b) recalibrating the idea of sustainability, (c) viewing people beyond resources, and (d) allotting more room for cooperative behaviours (Freeman et al., 2021).

For this article, however, it is important to understand what sources of competitive advantage are involved in the RBV concept, how managers should identify and approach them, and how they can systematically innovate, develop, and strengthen them.

4. Discussion

Groups of sources of competitive advantage with the same or similar characteristics and nature are linked to the individual components in the strategic construct presented below.

Thus, it is crucial for managers not only to understand the behavioural characteristics of individual sources of competitive advantage but also to understand their location within the firm's value chain, their impact on profitability, and an understanding of their erosive trends and temporal sustainability. The interrelationships within the firm's strategic construct are graphically depicted in the theoretical model in Figure 2.

Corporate Strategy and Competitive Advantage

Strategy and its development require deep analytical-synthetic management skills and a holistic approach. Strategy is a complex concept as it is composed of many elements (Khalifa, 2020). One of the key elements is competitive advantage, which links strategy and competitiveness. Strategic competitiveness is achieved when a firm successfully formulates and implements a strategy that creates value (Hitt et al., 2017). The strategy is an integrated and coordinated set of commitments and activities designed to leverage core competencies and gain a competitive advantage.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

In recent decades, there has been a tendency to change the traditional hierarchy of strategies: corporate-business-functional, to a more flexible, equal, and networked concept called "Heterarchy" focusing on a common goal (Chakravarthy & Henderson, 2007). However, the fundamental component of the strategy remains the way of conducting the competitive struggle in the specific market, the specific industry, and the specific conditions in which the company decides to do business.

It is clear that, given the constant changes in the external market environment, the creation, implementation, and adaptation of strategies is also a continuous, recurring, and never-ending process. Competitive strategy in business is not a one-off or static process. Still, it is predominantly a dynamic competitive strategy that consists of a sequence of interconnected actions and reactions unfolding over time (Hutzschenreuter & Israel, 2009).

Business strategy has a positive and significant impact on competitive advantage and, consequently, firm performance (Farida & Setiawan, 2022b).

In this sense, for this study, strategy holds the function of a framework where, at its core, amongst other components, is represented as the component of either an already existing competitive advantage or there lies the potential to create one.

A very strong interdependence is established, i.e., any change at the strategy level has an impact on the size and effects of the competitive advantage and, hence, on the firm's performance, and vice-versa, any change that takes place at the level of the sources of competitive advantage has a significant impact on the firm's performance and triggers the need for a reassessment of the strategy.

Competitive Advantage and Value Chain

The basic concept of value creation within a competitive strategy was proposed by Michal Porter in 1985 as the Value chain. The value chain is a set of activities that an organisation performs and through which the company's activities are distributed and analysed in individual process components. All activities are divided into primary activities and support activities, with competitive advantage arising either in one particular activity or, more often, in a combination and interdependence of relationships between multiple activities.

Much subsequent research and evolutionary development has extended or modified this value chain concept. Other authors have also defined the value chain as a way of conceptualising the activities that are needed to be competitive in providing a product or service to a customer (Ensign, 2001).

Newly developed theoretical frameworks of value chains using the literature streams of transaction cost economics, production networks, and technological capabilities attempt to explain the governance patterns in global value chains. In global value chains, the international competitiveness of advanced industrial economies in terms of traditional measures of export performance has gradually declined in recent decades in favour of emerging economies that have significantly expanded their shares of export markets for high- and medium-technology and industrial products (Gereffi, 2014).

Studies show that a theoretical understanding of the value chain is beneficial for building a business model and, when broken down to the level of a specific industry, provides ideal conditions for generating business models and, consequently, achieving competitive advantage (Strakova et al., 2021).

Current value chain research is gradually expanding under the influence of major transformation trends of enterprises and in the context of the current global economic recovery. Value chains are being examined both with a focus on a single area or sector and with a focus on business model upgrades within the supply chain and on technological innovation in green technologies (Wang & Gu, 2022).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

The value chain can also be characteristically considered as the place where a company's competitive advantage "resides". At certain and precisely identifiable points, the individual sources of competitive advantage materialise, which is further transformed into tangible, concrete, and measurable outputs.

Sustainability of Competitive Advantage

Any competitive advantage tends to erode, fade, and weaken over time. Its overall sustainability, resilience, and strength are measured by how competitors find it difficult to eliminate or completely overcome its specific and unique value-creating effect.

The sustainability of a competitive advantage is very closely related to its resources. This means that for a competitive advantage to be sustainable in the long run, it must be impossible, extremely costly, or otherwise difficult for competitors to duplicate the resources of the competitive advantage. Rumelt (2017) refers to this principle as the "isolation mechanism" a firm creates as a protective competitive barrier.

A similar widely accepted concept of sustainable competitive advantage comes from the financial world of successful investor Warren Buffet, who uses the term "Economic moat" (Dorsey, 2004), which is an advantage that creates such strong barriers that make it difficult for rivals to successfully compete with the firm, e.g. in terms of more significant financial differentiators such as lower operating costs, but also from less tangible sources such as brand strength, strong corporate culture, etc.

With steadily increasing competitive pressure, the advent of digitalisation, disruptive technologies, and the emergence of new technology startups and new business models, the stability of the industry structure is often significantly disrupted and becomes highly dynamic. This leads to the emergence of “hypercompetition", an environment that is characterised by a low ability to estimate competitive behaviour (D’Aveni & Gunther, 1994). Under these conditions, intense and rapid competitive movements occur, with firms being forced to make rapid counter-moves to create new advantages and significantly eliminate the existing advantages of their rivals.

With the current emergence of the digital economy, often characterised as a high-speed environment, hypercompetition is becoming the new normal. In such an environment, sustainable competitive advantage will be rare, if not outright impossible (Knudsen et al., 2021). In this perception, sustaining a unique competitive advantage over the long term is likely to become increasingly challenging and complex, with firms more likely to seek to create a series of temporary competitive advantages (Sirmon et al., 2007). Competitive advantage will more closely resemble the shorter-term concept of “Transient competitive advantage“ (McGrath, 2013). In this situation, companies must continuously launch new strategic initiatives, simultaneously creating and exploiting multiple transient competitive advantages.

Thus, the view of competitive advantage gains greater complexity when multiple layers of advantages coexist, thereby instilling a multilevel competitive advantage. Thus, firms that are profitable over the long term and maintain market leadership exploit multilevel competitive advantage (Grant, 2022, p.330). This gives them the highest level of resilience and stability in a competitive environment.

The ability to correctly and timely detect and predict incoming changes in the external environment, which affect competitive advantage and may even mean its complete extinction, is conceptualised McGrath (2021, p.51) by defining the period of optimal warning about the magnitude and significance of the incoming change.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

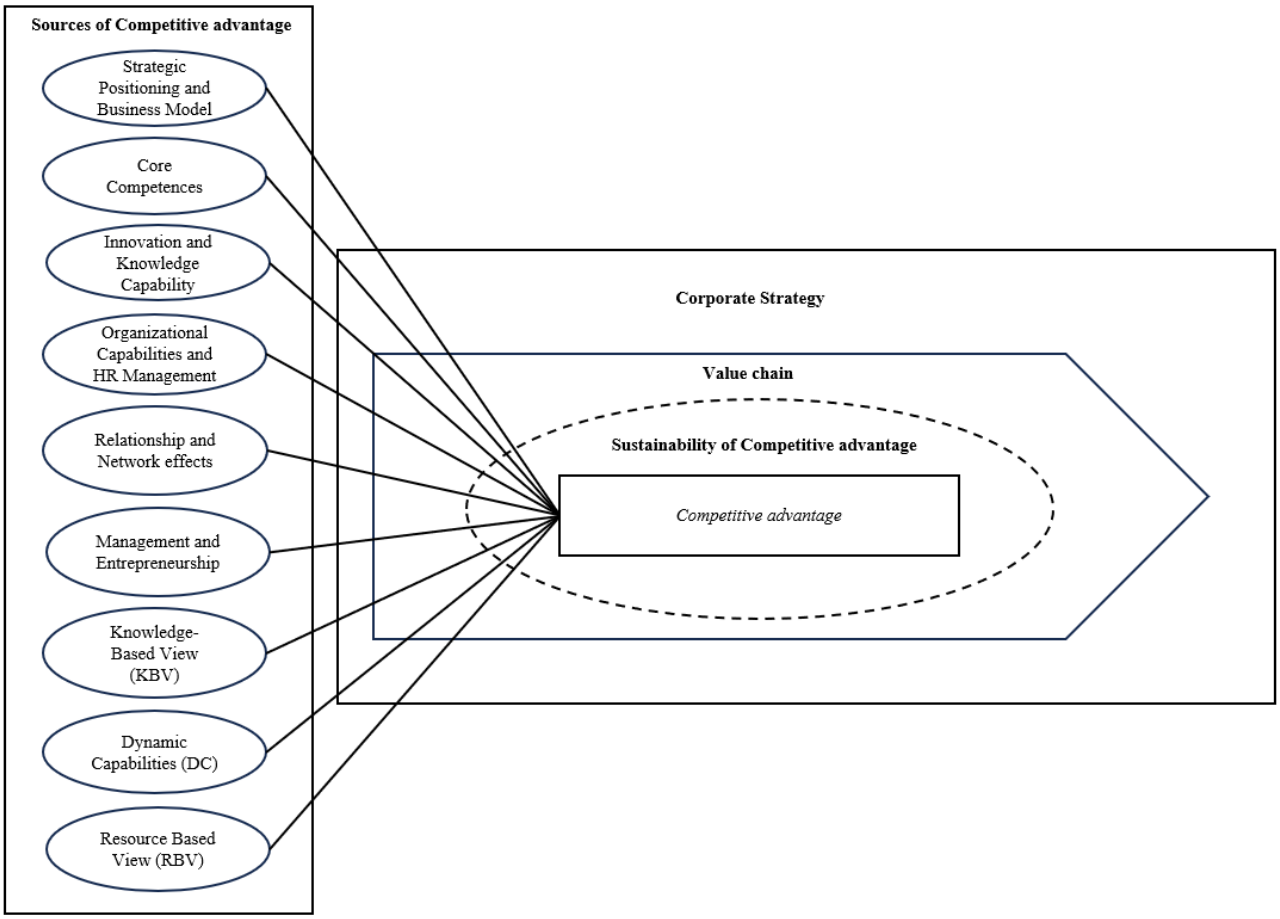


Figure 2. The interrelationships of sources of competitive advantage and the firm's strategic construct

5. Managerial Implication and Conclusion

Corporate strategy is a coordinated set of activities managers perform to outperform competitors and achieve superior profitability (Gamble et al., 2024, p.3). Part of creating and continuously updating corporate strategies is the validation of assumptions with a view to the medium to long-term future with a certain degree of predictable uncertainty (Courtney et al., 1997). In today's highly interconnected and wide-open global market environment full of unpredictable changes, estimates and scenarios of future developments are becoming increasingly complex. Strategic decisions in setting companies' future direction are becoming increasingly challenging for senior management. Managers, therefore, face complex challenges in setting up a sufficiently efficient, effective, and sustainable business model.

The current new directions of strategic thinking in an unstable environment require new approaches to formulating and implementing corporate strategies. The result is changes in the reorientation of corporate objectives, new approaches to competitive advantage, and learning to compete in digital markets, and a greater emphasis on making strategic choices.

Increasing competitive intensity, disruptive technologies, the emerging broad application era of AI, and new digital startups mean that competitive advantage in creating and seeking uniqueness and differentiation through a process of deep thinking is increasingly hard and challenging to create and sustain. Therefore, unless company management attempts to create unique differentiation, which is often difficult to achieve, none will emerge, and companies will lose without it. Suppose managers try to offer across-the-board superiority without carefully selecting differentiators beforehand while at the same time trying to outperform competitors with a range of differentiators that are too broad (lower price, better service, superior style, etc.). In that case, such attempts are

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

doomed to fail because of their internal inconsistency and extreme resource intensity (Hambrick & Fredrickson, 2001).

Thus, in seeking uniqueness and selecting differentiators, senior managers should prioritise a few mutually reinforcing, consistent with the firm's resources and capabilities, and have high value in the areas of the business the firm is focused on. For this reason, a good and detailed understanding of the concept of competitive advantage is essential for managers. It is, therefore, about an accurate understanding of the specific sources of competitive advantage, their behavioural characteristics, their location within the firm and its value chain, their impact on profitability, and an understanding of their erosive trends, resilience, and sustainability.

The research method of biometric analysis using the software tool VOSviewer revealed correlations between the concept of "competitive advantage" and "main characterising keywords", with 9 clusters represented by the most frequent keywords. By their descriptive sentence interpretation, the clusters were then classified under commonly known managerial frameworks, theories, and concepts, which differ from each other but represent well-understood theories with clear generic characteristics, specific manifestations, and unified and consistent characteristics. Within these, the authors then extract 135 of the most apparent sources of competitive advantage where, by looking back at their roots and origins, managers can understand the theoretical area or framework that relates specifically to their own achieved or potentially achievable competitive advantage.

Suppose managers correctly understand and evaluate the nature and characteristics of competitive advantage and its sources in their firm. In that case, they can already accurately assess its unique differentiating significance, determine the strength of its impact on the value creation process, profitability, and the firm's financial performance, and realistically assess the threat of its erosive loss or the threat of rivals to imitate or duplicate it.

In striving to maintain some strategic consistency, managers can then work very effectively and specifically to cultivate sources of competitive advantage or, through a creative or innovative strategic process, find room to strengthen them, prioritise them, or look for broader multiplier or multilevel effects.

In this article, the authors provide insight into a deeper understanding of the topic of competitive advantage and its sources, seeking to fill an important gap between scientific theory and real-world managerial practice. Understanding managerial frameworks, theories, and concepts related to competitive advantage and the characteristics of their specific sources can, given the right market assumptions, stimulate new ideas and innovations and contribute significantly to the creation of new and undiscovered competitive advantages.

References

Abernethy, M. A., Hung, C., & Jiang, L. (2024). Managers' career preferences and corporate culture. *Contemporary Accounting Research, 41*(3), 1543-1576 https://doi.org/10.1111/1911-3846.12948

Alexy, O. (2022). How flat can it get? From better at flatter to the promise of the decentralised, boundaryless organisation. *Journal of Organization Design*, *11*(1), 31–36. https://doi.org/10.1007/s41469-022-00110-0

Ali, B. J., & Anwar, G. (2021). Business strategy: The influence of Strategic Competitiveness on competitive advantage. *International Journal of Electrical, Electronics and Computers*, *6*(2), 1–10. https://doi.org/10.22161/eec.62.1

Bacigalupo, M., Kampylis, P., Punie, Y., & Van den Brande, G. (2016). EntreComp: The entrepreneurship competence framework. *Luxembourg: Publication Office of the European Union, 10*, 593884.

Baia, E., Ferreira, J. J., & Rodrigues, R. (2020). Value and rareness of resources and capabilities as sources of competitive advantage and superior performance. *Knowledge Management Research & Practice*, *18*(3), 249–262. https://doi.org/10.1080/14778238.2019.1599308

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management*, *17*(1), 99–120. https://doi.org/10.1177/014920639101700108

Bashir, M., & Verma, R. (2017). Why business model innovation is the new competitive advantage. *IUP Journal of Business Strategy*, *14*(1), 7.

Belas, J., Škare, M., Gavurova, B., Dvorsky, J., & Kotaskova, A. (2022). The impact of ethical and CSR factors on engineers' attitudes towards SMEs sustainability. *Journal of Business Research*, 149, 589-598. https://doi.org/10.1016/j.jbusres.2022.05.056

Benito, G. R. G., Cuervo-Cazurra, A., Mudambi, R., Pedersen, T., & Tallman, S. (2022). The future of global strategy. *Global Strategy Journal*, *12*(3), 421–450. https://doi.org/10.1002/gsj.1464

Bocken, N. M. P., & Geradts, T. H. J. (2020a). Barriers and drivers to sustainable business model innovation: Organisation design and dynamic capabilities. *Long Range Planning*, *53*(4), 101950. https://doi.org/10.1016/j.lrp.2019.101950

Bocken, N. M. P., & Geradts, T. H. J. (2020b). Barriers and drivers to sustainable business model innovation: Organisation design and dynamic capabilities. *Long Range Planning*, *53*(4), 101950. https://doi.org/10.1016/j.lrp.2019.101950

Cao, D., Wang, Y., Berkeley, N., & Tjahjono, B. (2022). Configurational conditions and Sustained Competitive Advantage: A fsQCA approach. *Long Range Planning*, *55*(4), 102131. https://doi.org/10.1016/j.lrp.2021.102131

Cenamor, J. (2021). Complementor competitive advantage: A framework for strategic decisions. *Journal of Business Research*, *122*, 335–343. https://doi.org/10.1016/j.jbusres.2020.09.016

Courtney, H., Kirkland, J., & Viguerie, P. (1997). Strategy under uncertainty. *Harvard Business Review*, *75*(6), 67–79.

Covin, J. G., & Wales, W. J. (2019). Crafting High-Impact Entrepreneurial Orientation Research: Some Suggested Guidelines. *Entrepreneurship Theory and Practice*, *43*(1), 3–18. https://doi.org/10.1177/1042258718773181

Danilovic, M., & Leisner, P. (2007). *Analysing core competence and core products for developing agile and adaptable corporation*. 49–60.

D'Aveni, R. A., & Gunther, R. E. (1994). *Hypercompetition: Managing the dynamics of strategic maneuvering*. The Free Press ; Maxwell Macmillan Canada ; Maxwell Macmillan International.

Deszczyński, B. (2021). *Firm Competitive Advantage Through Relationship Management: A Theory for Successful Sustainable Growth*. Springer International Publishing. https://doi.org/10.1007/978-3-030-67338-3

Dixit, S., Singh, S., Dhir, S., & Dhir, S. (2021). Antecedents of strategic thinking and its impact on competitive advantage. *Journal of Indian Business Research*, *13*(4), 437–458. https://doi.org/10.1108/JIBR-08-2020-0262

D'Oria, L., Crook, T. R., Ketchen, D. J., Sirmon, D. G., & Wright, M. (2021). The Evolution of Resource-Based Inquiry: A Review and Meta-Analytic Integration of the Strategic Resources–Actions–Performance Pathway. *Journal of Management*, *47*(6), 1383–1429. https://doi.org/10.1177/0149206321994182

Dorsey, P. (2004). *The Five Rules for Successful Stock Investing: Morningstar's Guide to building wealth and winning in the market*. John Wiley & Sons.

Dymitrowski, A., & Mielcarek, P. (2021). Business Model Innovation Based on New Technologies and Its Influence on a Company's Competitive Advantage. *Journal of Theoretical and Applied Electronic Commerce Research*, *16*(6), 2110–2128. https://doi.org/10.3390/jtaer16060118

Eden, C., & Ackermann, F. (2010). Competences, distinctive competences, and core competences. In R. Sanchez, A. Heene, & T. Ede Zimmermann (Ed.), *Research in Competence-Based Management* (Roč. 5, s. 3–33). Emerald Group Publishing Limited. https://doi.org/10.1108/S1744-2117(2010)0000005004

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic management journal*, *21*(10-11), 1105–1121.

Eisenhardt, K. M., Santos, F. M., Pettigrew, I. A., Thomas, H., & Whittington, R. (2000). knowledge based view. *Handbook of strategy and management. London: Sage Publications*. https://doi.org/10.1002/1097-0266(200010/11)21:10/11<1105::AID-SMJ133>3.0.CO;2-E

Ensign, P. C. (2001). Value chain analysis and competitive advantage. *Journal of general Management*, *27*(1), 18–42. https://doi.org/10.1177/030630700102700102

European Parliament. Directorate General for Parliamentary Research Services. (2020). *Artificial intelligence: How does it work, why does it matter, and what we can do about it?* Publications Office. https://data.europa.eu/doi/10.2861/44572

Farida, I., & Setiawan, D. (2022a). Business Strategies and Competitive Advantage: The Role of Performance and Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 163. https://doi.org/10.3390/joitmc8030163

Farida, I., & Setiawan, D. (2022b). Business Strategies and Competitive Advantage: The Role of Performance and Innovation. *Journal of Open Innovation: Technology, Market, and Complexity*, *8*(3), 163. https://doi.org/10.3390/joitmc8030163

Ferreira, J., Mueller, J., & Papa, A. (2020). Strategic knowledge management: Theory, practice and future challenges. *Journal of Knowledge Management*, *24*(2), 121–126. https://doi.org/10.1108/JKM-07-2018-0461

Fjeldstad, Ø. D., & Snow, C. C. (2018). Business models and organisation design. *Long range planning*, *51*(1), 32–39.

Freeman, R. E., Dmytriyev, S. D., & Phillips, R. A. (2021). Stakeholder Theory and the Resource-Based View of the Firm. *Journal of Management*, *47*(7), 1757–1770. https://doi.org/10.1177/0149206321993576

Gamble, J. E., Peteraf, M. A., & Thompson, A. A. (2024). *Essentials of strategic management: The quest for competitive advantage* (8e, international student edition vyd.). McGraw Hill.

Gavurová, B., Vagasová, T., & Kováč, V. (2016). Competitiveness Assessment of Slovak Republic Regions. European Financial System 2016: European Financial System 2016: Proceedings of the 13th International Scientific Conference, Brno, Jun 27-28, p. 175+.

Gavurova, B., Soltes, M., & Kovac, V. (2017). Application of cluster analysis in process of competitiveness modelling of Slovak Republic regions. *Transformation in Business & Economic*, 16(3), 129-147.

Gavurova, B., Belas, J., Bilan, Y., & Horak, J. (2020). Study of legislative and administrative obstacles to SMEs business in the Czech Republic and Slovakia. *Oeconomia Copernicana*, 11(4), 689–719. https://doi.org/10.24136/oc.2020.028

Gavurova, B., Schonfeld, J., Bilan, Y., & Dudas, T. (2022). Study of the Differences in the Perception of the Use of the Principles of Corporate Social Responsibility in Micro, Small and Medium-Sized Enterprises in the V4 Countries. *Journal of Competitiveness*, 14(2), 23–40. https://doi.org/10.7441/joc.2022.02.02

Gereffi, G. (2014). Global value chains in a post-Washington Consensus world. *Review of International Political Economy*, *21*(1), 9–37. https://doi.org/10.1080/09692290.2012.756414

Grant, R. M. (1996). Toward a knowledge-based theory of the firm. *Strategic Management Journal*, *17*(S2), 109–122. https://doi.org/10.1002/smj.4250171110

Grant, R. M. (2022). *Contemporary strategy analysis* (Eleventh edition). John Wiley & Sons.

Hambrick, D. C., & Fredrickson, J. W. (2001). Are you sure you have a strategy? *Academy of Management Perspectives*, *15*(4), 48–59. https://doi.org/10.5465/ame.2001.5897655

Hitt, M. A., Ireland, R. D., & Hoskisson, R. E. (2017). *Strategic management: Competitiveness & globalisation. Concepts* (12e vyd.). Cengage Learning.

Hutzschenreuter, T., & Israel, S. (2009). A review of empirical research on dynamic competitive strategy. *International Journal of Management Reviews*, *11*(4), 421–461. https://doi.org/10.1111/j.1468-2370.2008.00246.x

Chakravarthy, B., & Henderson, J. (2007). From a hierarchy to a heterarchy of strategies: Adapting to a changing context. *Management Decision*, *45*(3), 642–652. https://doi.org/10.1108/00251740710745160

Chen, A., Lin, Y., Mariani, M., Shou, Y., & Zhang, Y. (2023). Entrepreneurial growth in digital business ecosystems: An integrated framework blending the knowledge-based view of the firm and business ecosystems. *The Journal of Technology Transfer*, *48*(5), 1628–1653. https://doi.org/10.1007/s10961-023-10027-9

Chikán, A., Czakó, E., Kiss-Dobronyi, B., & Losonci, D. (2022). Firm competitiveness: A general model and a manufacturing application. *International Journal of Production Economics*, *243*, 108316. https://doi.org/10.1016/j.ijpe.2021.108316

Christensen, C. M. (2008). *The innovator's dilemma: When new technologies cause great firms to fail* (Rev., updated, and with a new chapter, [Nachdr.]). Harvard Business School Press.

Jaakkola, E. (2020). Designing conceptual articles: Four approaches. *AMS Review*, *10*(1–2), 18–26. https://doi.org/10.1007/s13162-020-00161-0

Kemp, A. (2023). Competitive Advantage Through Artificial Intelligence: Toward a Theory of Situated AI. *Academy of Management Review*, amr.2020.0205. https://doi.org/10.5465/amr.2020.0205

Kengatharan, N. (2019). A knowledge-based theory of the firm: Nexus of intellectual capital, productivity and firms' performance. *International Journal of Manpower*, *40*(6), 1056–1074. https://doi.org/10.1108/IJM-03-2018-0096

Keskin, H., Ayar Şentürk, H., Tatoglu, E., Gölgeci, I., Kalaycioglu, O., & Etlioglu, H. T. (2021). The simultaneous effect of firm capabilities and competitive strategies on export performance: The role of competitive advantages and competitive intensity. *International Marketing Review*, *38*(6), 1242–1266. https://doi.org/10.1108/IMR-09-2019-0227

Khalifa, A. S. (2020). Strategy, nonstrategy and no strategy. *Journal of Strategy and Management*, *14*(1), 35–49. https://doi.org/10.1108/JSMA-04-2020-0092

Kim, W. C., & Mauborgne, R. (2005). *Blue ocean strategy: How to create uncontested market space and make the competition irrelevant*. Harvard Business School Press.

Knudsen, E. S., Lien, L. B., Timmermans, B., Belik, I., & Pandey, S. (2021). Stability in turbulent times? The effect of digitalisation on the sustainability of competitive advantage. *Journal of Business Research*, *128*, 360–369. https://doi.org/10.1016/j.jbusres.2021.02.008

Krakowski, S., Luger, J., & Raisch, S. (2022). Artificial intelligence and the changing sources of competitive advantage. *Strategic Management Journal*, smj.3387. https://doi.org/10.1002/smj.3387

Kuratko, D. F., Fisher, G., & Audretsch, D. B. (2021). Unraveling the entrepreneurial mindset. *Small Business Economics*, *57*(4), 1681–1691. https://doi.org/10.1007/s11187-020-00372-6

Lin, F.-J., & Lin, Y.-H. (2016). The effect of network relationship on the performance of SMEs. *Journal of Business Research*, *69*(5), 1780–1784. https://doi.org/10.1016/j.jbusres.2015.10.055

Lin, H.-E., Hsu, I.-C., Hsu, A. W., & Chung, H.-M. (2020). Creating competitive advantages: Interactions between ambidextrous diversification strategy and contextual factors from a dynamic capability perspective. *Technological Forecasting and Social Change*, *154*, 119952. https://doi.org/10.1016/j.techfore.2020.119952

Lukka, K., & Vinnari, E. (2014). Domain theory and method theory in management accounting research. *Accounting, Auditing & Accountability Journal*, *27*(8), 1308–1338. https://doi.org/10.1108/AAAJ-03-2013-1265

Lumpkin, G. T., & Dess, G. G. (1996). Clarifying the Entrepreneurial Orientation Construct and Linking It to Performance. *The Academy of Management Review*, *21*(1), 135. https://doi.org/10.2307/258632

Madhani, P. M. (2010). Resource based view (RBV) of competitive advantage: An overview. *Resource based view: concepts and practices, Pankaj Madhani, ed*, 3–22.

Mahrinasari, M., Hussain, S., Yapanto, L. M., Esquivel-Infantes, S. M., Untari, D. T., Yusriadi, Y., & Diah, A. (2021). The impact of decision-making models and knowledge management practices on performance. *Academy of Strategic Management Journal*, *20*, 1–13.

McGrath, R. G. (2013). *The end of competitive advantage: How to keep your strategy moving as fast as your business*. Harvard Business Review Press.

McGrath, R. G. (2021). *Seeing around corners: How to spot inflection points in business before they happen*. Mariner Books.

Miller, D. (1983). The correlates of entrepreneurship in three types of firms. *Management science*, *29*(7), 770–791.

Miller, D. (2019). The Resource-Based View of the Firm. In D. Miller, *Oxford Research Encyclopedia of Business and Management*. Oxford University Press. https://doi.org/10.1287/mnsc.29.7.770

Miocevic, D. (2021). Dynamic exporting capabilities and SME's profitability: Conditional effects of market and product diversification. *Journal of Business Research*, *136*, 21–32. https://doi.org/10.1016/j.jbusres.2021.07.025

Mohamed, R., Basar, P., & Department of Business Administration, Istanbul Ticaret University, Faculty of Social Sciences, Istanbul, Turkey. (2023). Impact of Strategic Management on Competitive Advantage. *Trends in Business and Economics*, *37*(1), 46–56. https://doi.org/10.5152/TBE.2023.1000204

Moon, H. C., Hur, Y. K., Yin, W., & Helm, C. (2014). Extending Porter's generic strategies: From three to eight. *European J. of International Management*, *8*(2), 205. https://doi.org/10.1504/EJIM.2014.059583

Naradda Gamage, S. K., Ekanayake, E., Abeyrathne, G., Prasanna, R., Jayasundara, J., & Rajapakshe, P. (2020). A Review of Global Challenges and Survival Strategies of Small and Medium Enterprises (SMEs). *Economies*, *8*(4), 79. https://doi.org/10.3390/economies8040079

Naumann, C. (2017). Entrepreneurial Mindset: A Synthetic Literature Review. *Entrepreneurial Business and Economics Review*, *5*(3), 149–172. https://doi.org/10.15678/EBER.2017.050308

OECD & Europäische Kommission (Ed.). (2005). *Oslo manual: Guidelines for collecting and interpreting innovation data* (3. ed). OECD.

OECD & Eurostat. (2018). *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation, 4th Edition*. OECD. https://doi.org/10.1787/9789264304604-en

Pereira, V., & Bamel, U. (2021). Extending the resource and knowledge based view: A critical analysis into its theoretical evolution and future research directions. *Journal of Business Research*, *132*, 557–570. https://doi.org/10.1016/j.jbusres.2021.04.021

Pisano, G. P. (2015). You need an innovation strategy. *Harvard business review*, *93*(6), 44–54.

Porter, M. E. (1985). *Competitive Advantage: Creating and Sustaining Superior Performance*. The Free Press, New Your, NY.

Porter, M. E. (1991). Towards a dynamic theory of strategy. *Strategic Management Journal*, *12*(S2), 95–117. https://doi.org/10.1002/smj.4250121008

Porter, M. E. (2004). *Competitive strategy: Techniques for analysing industries and competitors* (First Free Press export edition). Free Press.

Prahalad, C. K., & Hamel, G. (1990). Harvard Business Review. *The Core Competence of the Corporation*, 79–91.

Rumelt, R. P. (2017). *Good strategy, bad strategy: The difference and why it matters*. Profile Books.

Saskia De Klerk. (2012). Establishing and developing business networks: The importance of trust. *AFRICAN JOURNAL OF BUSINESS MANAGEMENT*, *6*(18). https://doi.org/10.5897/AJBM11.2637

Schoemaker, P. J. H., Heaton, S., & Teece, D. (2018). Innovation, Dynamic Capabilities, and Leadership. *California Management Review*, *61*(1), 15–42. https://doi.org/10.1177/0008125618790246

Schumpeter, J. A. (1994). *Capitalism, socialism and democracy*. Routledge.

Sigalas, C. (2015). Competitive advantage: The known unknown concept. *Management Decision*, *53*(9), 2004–2016. https://doi.org/10.1108/MD-05-2015-0185

Sirmon, D. G., Hitt, M. A., & Ireland, R. D. (2007). Managing firm resources in dynamic environments to create value: Looking inside the black box. *Academy of management review*, *32*(1), 273–292.

Soh, P. (2010). Network patterns and competitive advantage before the emergence of a dominant design. *Strategic Management Journal*, *31*(4), 438–461. https://doi.org/10.1002/smj.819

Sołoducho-Pelc, L., & Sulich, A. (2020). Between Sustainable and Temporary Competitive Advantages in the Unstable Business Environment. *Sustainability*, *12*(21), 8832. https://doi.org/10.3390/su12218832

Spanos, Y. E., & Prastacos, G. (2004). Understanding organisational capabilities: Towards a conceptual framework. *Journal of Knowledge Management*, *8*(3), 31–43. https://doi.org/10.1108/13673270410541024

Strakova, J., Simberova, I., Partlova, P., Vachal, J., & Zich, R. (2021). The Value Chain as the Basis of Business Model Design. *Journal of Competitiveness*, *13*(2), 135–151. https://doi.org/10.7441/joc.2021.02.08

Suciu, M. C., Plesea, D. A., Petre, A., Simion, A., Mituca, M. O., Dumitrescu, D., Bocaneala, A. M., Moroianu, R. M., & Nasulea, D. F. (2023). Core Competence—As a Key Factor for a Sustainable, Innovative and Resilient Development Model Based on Industry 5.0. *Sustainability*, *15*(9), 7472. https://doi.org/10.3390/su15097472

Tampoe, M. (1994). Exploiting the core competences of your organisation. *Long range planning*, *27*(4), 66–77. https://doi.org/10.1016/0024-6301(94)90057-4

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350. https://doi.org/10.1002/smj.640

Teece, D. J. (2023). The Evolution of the Dynamic Capabilities Framework. In R. Adams, D. Grichnik, A. Pundziene, & C. Volkmann (Ed.), *Artificiality and Sustainability in Entrepreneurship*, p. 113–129. https://doi.org/10.1007/978-3-031-11371-0_6

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509–533. https://doi.org/10.1002/(SICI)1097-0266(199708)18:7<509::AID-SMJ882>3.0.CO;2-Z

Tkacova, A., & Gavurova, B. (2023). Economic sentiment indicators and their prediction capabilities in business cycles of EU countries. *Oeconomia Copernicana*, *14*(3), 977–1008. https://doi.org/10.24136/oc.2023.029

Ulrich, D., & Lake, D. (1991). Organisational capability: Creating competitive advantage. *Academy of Management Perspectives*, *5*(1), 77–92. https://doi.org/10.5465/ame.1991.4274728

Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, *72*, 577–588. https://doi.org/10.1016/j.chb.2017.03.010

Walliman, N. (2011). *Research methods: The basics*. Routledge. https://doi.org/10.4324/9780203836071

Wang, S., & Gu, Z. (2022). Mapping the Field of Value Chain: A Bibliometric and Visualization Analysis. *Sustainability*, *14*(12), 7063. https://doi.org/10.3390/su14127063

Waseem, A., Rashid, Y., & Kausar, A. R. (2023). Composition-based strategy and firm's performance: The mediating role of competitive advantage. *International Journal of Globalisation and Small Business*, *13*(3), 291. https://doi.org/10.1504/IJGSB.2023.130346

Weber, M., Engert, M., Schaffer, N., Weking, J., & Krcmar, H. (2023). Organisational Capabilities for AI Implementation—Coping with Inscrutability and Data Dependency in AI. *Information Systems Frontiers*, *25*(4), 1549–1569. https://doi.org/10.1007/s10796-022-10297-y

Wernerfelt, B. (1984). A Resource-Based View of the Firm. *Strategic Management Journal*, *5*(2), 171–180. JSTOR. https://doi.org/10.1002/smj.4250050207

Zakhidov, G. (2024). Economic indicators: Tools for analysing market trends and predicting future performance. *International Multidisciplinary Journal of Universal Scientific Prospectives*, *2*(3), 23–29.

Zeng, J., Yang, Y., & Lee, S. H. (2023). Resource Orchestration and Scaling-up of Platform-Based Entrepreneurial Firms: The Logic of Dialectic Tuning. *Journal of Management Studies*, *60*(3), 605–638. https://doi.org/10.1111/joms.12854

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

Appendix. The observed clustering outputs and subsequent derivations

Cluster	No of Items	10 keyword representatives with the highest occurence rate in Cluster (No of occurence)	Descriptive perception of the cluster supporting the quest for the source of competitive advantage	Derived managerial frameworks, theories and concepts that fit the cluster and its descriptive perception	Prominent representatives of the sources of competitive advantage that fit derived managerial frameworks, theories and concepts
1	183	growth (85) competition (66) system (45) evolution (43) environment (43) dynamics (42) diversity (42) identification (38) power (33) efficiency (30)	The basic goal of a firm is a search for growth in the competitive environment, using systems that are evolving within a given environment with a certain level of dynamics and diversity, searching for its own identity using relevant power and efficiency	**Strategic Positioning and Business Model**	**Cost-effectiveness:** a business model developed that enables the organisation to reduce production and operating costs, allowing it to offer competitive prices **Product / service differentiation:** strategic positioning in the marketplace with a unique product or service that customers perceive as valuable and differentiated from competitors **Customer focus:** a customer-centric business model with an emphasis on understanding customer needs and providing highly personalised products/services **Scalability:** the ability of an organisation to expand and grow without significantly increasing costs based on the existing model, enabling revenue and profit growth **Technology development:** a business model focused on the development and commercialisation of new technologies or products, enabling the organisation to be first to market **Brand and reputation:** a strong brand and positive reputation can attract customers and build loyalty **Distribution network:** an effective distribution model that enables the organisation to reach customers faster and more efficiently than competitors **Partner relationships:** collaborations with other companies or partnerships that provide access to new resources and markets **Product and service ecosystem:** creating a broad ecosystem of products and services that extends the value of the organisation to customers **Global presence:** a business model that enables an organisation to operate in international markets and benefit from global opportunities **Innovation in pricing strategy:** a combination of different pricing strategies or an approach to price discrimination that enables an organisation to compete effectively **Sharing economy:** the use of sharing economy and resource sharing models, which can reduce costs and increase efficiency **Quality and reliability:** a business model that relies on maintaining high product or service quality and reliability over the long term **Agility and rapid response to market changes:** the ability to adapt quickly to new trends and market changes can provide a competitive advantage **Risk management:** the ability to manage and minimise the risks associated with business and operations
2	150	model (229) technology (134) systems (122) framework (101) information (92) information technology (77) supply chain (61) big data (54) design (53) value creation (51)	A firm model using technology and systems in the framework of relevant information and information technology relying on supply chain and big data sources in a design that creates value	**Core Competences**	**Technological expertise:** an organisation may have deep technological knowledge and capabilities that enable it to develop innovative products or services **Knowledge management and learning:** the ability to share, store and use knowledge within the organisation **Ability to innovate:** the ability to innovate quickly and come up with new ideas and solutions can be a key competence **Research and development:** strong ability to innovate and develop new products and technologies **Quality and reliability:** maintaining high product or service quality and reliability over the long term **Big data capability:** in today's digital age, organisations with competencies in data analysis and exploitation can gain a competitive advantage **Customer knowledge:** knowledge of customer needs and behaviours can help an organisation to better serve customers **Distribution network:** organisations with an efficient and wide distribution network can achieve greater market reach **Brand and reputation:** a strong brand and reputation that attracts customers and builds trust **Ability to respond quickly to change:** an organisation can have the competence to respond quickly to market changes and new opportunities **Management skills:** good leadership, planning and management can be key competencies for achieving long-term competitive advantage **Cultural competencies:** orgnisational culture and values can be a competency that differentiates an organisation and brings success **Skilled employees:** employees with high skills and knowledge in key areas **Process development:** unique manufacturing processes that reduce costs and increase efficiency **Logistics and supply chains:** efficient logistics and supply chain management for faster and cheaper deliveries
3	148	innovation (408) knowledge (249) absorptive-capacity (121) competitiveness (91) firms (89) networks (79) knowledge transfer (76) research-and-development (73) strategies (73) product development (73)	A firm´s innovation capability and knowledge management skill with absorptive capacity supporting competitiveness within a given network environment using transferred knowledge, R&D, and product development within defined strategies	**Innovation and Knowledge Capability**	**Research and Development (R&D):** the ability to invest in research and development of new products and technologies that customers find innovative **Knowledge and know-how:** having specialists with deep knowledge and skills that are key to innovation and new product creation **Intellectual property:** holding patents, copyrights and intellectual property protection can protect innovative ideas and technologies **Innovation culture:** fostering innovation and creativity within the organisation and encouraging employees to come up with new ideas **Data processing and analysis:** the ability to collect and analyse data and information can provide insights for innovation and strategic decisions **Collaboration and partnerships:** working with other organisations, universities or research institutions can provide access to new knowledge and resources **Quality of research teams:** teams of researchers and engineers who are able to develop new technologies and solutions **Knowledge management:** effective management of knowledge within the organisation and sharing of information and experience among employees **Expertise and trend foresight:** monitoring and analysing market trends and competition can help an organisation identify new innovation opportunities **Employee training and development:** investing in employee training and development can improve an organisation's ability to innovate **Open Innovation:** collaborating with external sources of innovation such as customers, suppliers and third-party developers **Agile development and iteration:** using agile methodologies and rapid iteration can accelerate new product development **Experimentation and venture capital:** openness to trying new ideas and investing in venture capital to support innovation **Cultural factors:** organisational culture and values that promote learning and innovation **Focus on sustainability:** innovations in sustainability and environmental responsibility can gain support from customers and government regulators
4	89	antecedents (89) organizational performace (63) organizations (63) human-resource-management (60) productivity (53) organization (51) moderation role (44) leadership (43) commitment (42) mediating role (38)	The antecedents of the current firm´s capability with a certain organizational structure with its performance and given HR aimed at productivity and relevant leadership and commitment	**Organizational Capabilities and HR Management**	**Experienced and skilled employees:** employees with high skills and experience can bring a competitive advantage **Teamwork and collaboration:** the ability to build strong teams and foster collaboration between employees can improve organisational performance **Training and development:** investing in training and development for employees to improve their skills and knowledge **Employee engagement:** employees who are engaged and satisfied with their jobs can be more productive **Fair pay and benefits:** offering competitive salaries and benefits can help an organisation attract and retain talented employees **Leadership development:** the ability to identify and develop executives and leaders within the organization **Cultural competency:** an organization's culture and values that foster innovation, collaboration and performance **Diversity and Inclusion:** actively seeking to create a diverse workforce and fostering an inclusive work environment **Performance management:** an effective system for evaluating and managing employee performance **Crisis and change management:** the ability of the organisation to respond to crises and environmental changes with minimal negative impact on operations **Employee supervision and career development:** providing opportunities for employees to grow and develop their careers within the organisation **Flexible working arrangements:** offering a variety of working patterns, including teleworking and flexible working hours **Focus on sustainability:** innovations in sustainability and social responsibility can gain support from customers and the investment market **Agile management:** the ability to react quickly to changes in the market and environment and to adapt to new conditions **Knowledge management and information sharing:** effective knowledge management and information sharing within an organisation can improve innovation and performance
5	83	impact (263) determinants (94) trust (74) quality (72) satisfaction (71) behavior (50) success (48) customer satisfaction (46) perception (41) product (38)	The competitive impacts and determinants on the market supported by trust, quality, satisfaction, behavior, and success, bring customer satisfaction and positive perception with the product orientation	**Relationship and Network effects**	**Customer loyalty:** building strong relationships with customers can lead to customer loyalty and a long-term relationship with the organization **Supplier relationships:** quality relationships with suppliers can ensure access to quality raw materials and components **Strategic partnerships:** maintaining strategic partnerships with other companies can provide access to new markets, customers and resources **Ecosystems and platforms:** building ecosystems or platforms for third parties can add value to an organisation and provide a competitive advantage **Knowledge sharing:** effective sharing of knowledge and know-how with partners can lead to innovation and efficiency gains **Global reach:** having extensive networks or a global presence can enable an organisation to reach customers around the world **Social network:** using social networks and online communities can help an organisation build relationships with customers and get feedback **Distribution networks:** effective distribution networks and chains can ensure fast and efficient delivery of products or services **Customer base:** a large and loyal customer base can mean repeat purchases and referrals, contributing to growth **Community support and charity:** social responsibility activities and charity can build an organisation's reputation and attract customers **Referral partners:** gaining referrals from satisfied partners or customers can strengthen an organisation's reputation **Standards and interoperability:** adherence to industry standards and interoperability with other systems can facilitate collaboration and business relationships **Network experience and expertise:** leveraging the experience and know-how of different partners in the network can bring new perspectives and opportunities **Network coordination and management:** the ability to coordinate and manage complex networks and relationships can be a competitive advantage **Innovation ecosystems:** collaboration with innovative firms and institutions can support the development of new products and technologies
6	83	performance (548) management (357) firm performance (157) perspective (108) sustainability (85) intellectual capital (82) business (74) human capital (56) strategic management (51) financial performace (48)	Firm performance is linked to management, long-term perspective, sustainability, intellectual capital that supports business, human capital, and strategic management with an effect in financial performance	**Management and Enterpreneurship**	**Leadership and management:** quality management can effectively manage teams and make strategic decisions **Innovation culture:** a culture of innovation and fostering creativity can lead an organisation to develop new products and solutions **Adaptability:** the ability of an organisation to respond quickly to changes in the market and environment **Risk management:** effective risk management and resilience to uncertainty **Entrepreneurial spirit:** fostering entrepreneurship and the ability to take risks and invest in new opportunities **Strategic planning:** the ability to develop and implement effective strategies to achieve the organisation's goals **Customer focus:** emphasising customer needs and requirements within the organisation's strategy and operations **Workforce and teamwork:** building teams with diverse skills and the ability to work together effectively **Legal and regulatory know-how:** knowledge of and ability to comply with industry regulations and standards **Financial management:** ability to manage funds and invest them in growth and innovation **Investor relations:** trust and support from investors can help raise funds for growth **Market knowledge:** a good understanding of the market and competitive environment can help an organisation develop successful strategies **Expertise and know-how:** obtaining know-how from industry and sector experts **Agile management:** the ability of an organisation to respond quickly to change and adapt to new conditions **Networking:** building and maintaining extensive networks and relationships within the industry and among partners

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/a5295986656

7	51	knowledge management (199) supply chain management (59) sustainable competitive advantage (46) business performance (40) organizational learning (31) barriers (26) intangible assets (23) total quality management (19) quality management (17) new product development (14)	The dominant knowledge management supported by supply chain management brings sustainable competitive advantage and business performance within organizational learning capability, creates competitive barriers, and supports intangible assets, quality management, and new product development	**Knowledge-Based View (KBV)**	**Experts and know-how:** the organisation can work with experts and scientists with deep knowledge in their sector, enabling them to innovate and solve complex problems **Internal know-how and employee skills:** the knowledge, skills and experience of employees can move an organisation forward within the industry **Intellectual property:** patents, copyrights and other forms of intellectual property can protect and exploit key knowledge **Databases and information:** effective collection, analysis and use of data can provide valuable information for strategic decision-making **Employee training and development:** investing in employee knowledge and skills development can improve organisational performance **Customer experience:** knowledge of customer needs and preferences can be used to create products and services that better suit the market **Knowledge Management:** systems and processes to effectively collect, store and share knowledge within the organisation **Research and development:** investment in research and development can lead to new knowledge-based technologies and products **Collaboration and partnerships:** collaboration with other organisations, universities or research institutions can provide access to new knowledge and resources **Knowledge systems and technologies:** effective use of knowledge systems and technologies for the collection, preservation and distribution of knowledge **Knowledge ecosystem:** the creation and maintenance of a comprehensive knowledge ecosystem that includes internal and external resources **Strategic analysis and forecasting:** the ability to analyse market trends and predict future events and changes **Market and customer knowledge:** deep understanding of customer needs and behaviours and market trends **Innovation culture:** a culture of innovation that encourages creative thinking and the development of new products and services **Leadership development:** identifying and developing leaders and executives with deep industry knowledge
8	48	strategy (228) dynamic capabilities (125) integration (96) advantage (56) implementation (34) communication (31) logistics (26) flexibility (26) competitive strategy (25) business model (25)	Strategy is linked to the firm's dynamic capabilities and their integration bringing advantage with a focus on implementation, communication, logistics, flexibility, supporting competitive strategy and business model	**Dynamic Capabilities (DC)**	**Rapid response to change:** an organisation's ability to respond quickly to new trends, technologies or changes in customer demand can be a competitive advantage **Flexible organisational structure:** organisations with flexible organisational structures can more easily adapt their operations to new requirements **Adaptive strategies:** the ability of an organisation to review and adjust its long-term strategies based on the current situation **Agile management and adaptation:** the ability of an organisation to respond quickly to new conditions and change its operational processes **Learning and adaptation:** the ability of an organisation to learn from its own mistakes and experiences and to adapt its strategies and processes based on this knowledge **Innovation culture:** fostering innovation and creativity within an organisation can lead to new products, services and ways of working **Collaboration and partnerships:** good collaboration with other organisations and partnerships can provide access to new resources and knowledge **Technological know-how:** strong technological skills and knowledge can enable the development of new technologies and processes **Culture and values change:** organisations can change their values and culture to better meet new challenges and objectives **Risk management:** good risk management and the ability to adapt quickly to unexpected events can be key to maintaining a competitive advantage **Customer relationships:** strong customer relationships and the ability to provide the best possible service can lead to greater loyalty and competitive advantage **Crisis and change management:** the ability to manage an organisation through times of crisis and change **Ability to create new products or services quickly:** shortening development cycles and developing new products quickly **Distribution flexibility:** the ability to quickly change distribution methods and respond to customer demands **Effective internal communication:** communication and collaboration within the organisation that enables rapid transfer of information and decision-making
9	46	competitive advantage (649) firms (193) resource-based view (192) capabilities (192) view (77) market orientation (73) resources (64) orientation (62) smes (55) resource-based theroy (50)	The competitive advantage of a firm is based on unique resources, capabilities, variation of business approaches, views, and market orientation	**Resource-Based View (RBV)**	**Patents and Intellectual property:** unique technologies and Intellectual property protection can provide a competitive advantage **Technological know-how:** unique technical and technological knowledge that enables an organisation to create exceptional products or services **Ownership of key assets:** control of key assets that are difficult to imitate by competitors **Physical resources:** unique facilities, real estate or geographic location can be a source of advantage **Qualified employees:** employees with high skills and experience who bring a competitive advantage **Distribution network:** if an organisation has a well-developed distribution network, this can provide an advantage in reaching customers **Relationships with suppliers and customers:** strong relationships can lead to greater efficiency and more favourable business terms **Brand and reputation:** a strong brand and reputation can provide customers with trust and preference **Innovation and R&D:** the ability to innovate and develop new products or services can provide a competitive advantage **Financial resources:** access to capital and financial stability can enable long-term growth **Cultural resources:** organisational culture and values can be a resource that differentiates a company from competitors **Efficient governance and processes:** optimising internal processes and management can increase efficiency and reduce costs **Quality and reliability:** maintaining high product or service quality and reliability over the long term **Knowledge management:** effective knowledge management and sharing of know-how within the organisation **Leadership and strategic decision-making:** the ability to develop and implement effective strategies to achieve the organisation's objectives

Author contributions: All authors contributed equally. All authors have read and agreed to the published version of the manuscript.

Horymír KALMUS is an MBA graduate practical manager and PhD candidate at the Pan-European University in Prague, Faculty of Entrepreneurship and Law, Spálená 76/14, 1100 Prague (Czech Republic). Research interests: strategic management, competitive advantage, agile innovations, project management.
ORCID ID: https://orcid.org/0009-0001-0899-5714

Marek VOCHOZKA is a Professor at the School of Expertness and Valuation, Institute of Technology and Business in České Budějovice, Okružní 517/10, 37001 České Budějovice (Czech Republic). Research interests: macroeconomics, microeconomics, corporate finance.
ORCID ID: https://orcid.org/0000-0001-9923-7814

Jarmila STRAKOVÁ is an Associate Professor at Institute of Technology and Business in České Budějovice, Okružní 517/10, 37001 České Budějovice (Czech Republic). Research interests: strategic management,
ORCID ID: https://orcid.org/0000-0002-3048-3467

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

Publisher
http://jssidoi.org/esc/home

USING ARTIFICIAL INTELLIGENCE TOOLS TO PREDICT AND ALLEVIATE POVERTY*

Ghada Alturif [1], Wafaa Saleh [2], Alaa A. El-Bary [3,4,5], Radwa Ahmed Osman [3]

[1]Department of Social Work College of Humanities and Social Sciences Princess Nourah bint Abdulrahman University Riyadh 11671, Saudi Arabia
[2]School of Computing Engineering and the Built Environment Edinburgh Napier University 10 Colinton Road EH10 5DT, Edinburgh, Scotland, UK
[3]College of Engineering Basic and Applied Science Institute Arab Academy for Science Technology and Maritime Transport P.O. Box 1029, Alexandria, Egypt
[4] National Committee for Mathematics Academy of Scientific Research and Technology Cairo, Egypt
[5]Council of Future Studies And Risk Management, Academy of Scientific Research and Technology Cairo, Egypt

E-mails: [1]gaaltarif@pnu.edu.sa; [2]W.saleh@napier.ac.uk; [3]aaelbary@aast.edu; [4]radwa.ahmed@aast.edu

Received 19 August 2024; accepted 23 November 2024; published 30 December 2024

Abstract. This paper presents a thorough time series forecasting model intended to project future performance with respect to Sustainable Development Goal 1 (SDG 1) and the corresponding poverty index scores for the years 2024–2030, with a particular emphasis on the United States, Saudi Arabia, China, Egypt, and Sweden. A one-dimensional Convolutional Neural Network (1D-CNN) is used in the model to examine and extract patterns from historical socio-economic data from 2000 to 2022. The algorithm uses deep learning techniques to efficiently extract temporal correlations from the data, allowing for accurate predictions of each country's progress towards ending poverty and raising living standards. Because it can effectively handle time series data and find connections and patterns in earlier observations to guide future advancements in poverty alleviation tactics, the 1D-CNN architecture was chosen. The model was trained and validated using historical data to ensure predictions for the following years were based on real dynamics. To reflect the viability of reaching SDG 1 targets, forecasts were also limited to a realistic range of 0 to 100. The findings show that the model can correctly forecast shifts in poverty levels, which is consistent with expected worldwide patterns. These projections offer insightful information for international organisations, stakeholders, and policymakers involved in sustainability programs. By giving decision-makers the insight they need to deploy resources and carry out successful interventions effectively, the strategy speeds up the process of reaching SDG 1.

Keywords: Sustainable Development Goals (SDGs); one-dimensional Convolutional Neural Network; SDGs Index Score; deep learning, AI

Reference to this paper should be made as follows: Alturif, G., Saleh, W., El-Bary, A.A., Osman, R.A. 2024. Managerial conceptualisation of Competitive advantage. *Entrepreneurship and Sustainability Issues*, 12(2), 400-413. http://doi.org/10.9770/b8436764898

JEL Classifications: O11, O15

* *The authors extend their appreciation to Princess Nourah bint Abdulrahman University Researchers Supporting Project number (PNURSP2024R705), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.*

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

1. Introduction

All United Nations member nations endorsed the 2030 Agenda for Sustainable Development in 2015, laying forth a shared vision for a sustainable future that includes social equality, economic prosperity, and environmental protection (Naciones Unidas, 2022). It lays out the 17 Sustainable Development Goals (SDGs), each of which aims to address one of the most critical issues facing humanity at the moment: ending poverty, enhancing health and education, decreasing inequality, accelerating economic growth, addressing climate change; and advancing environmental preservation as shown in Figure 1. A worldwide framework for attaining sustainable development that guarantees that "no one is left behind" is provided by the Sustainable Development Goals (SDGs) (Sachs et al., 2022). The Sustainable Development Goals (SDGs) encompass a comprehensive approach to sustainability in addition to concentrating on certain theme areas like poverty reduction (SDG 1), education quality (SDG 4), and climate action (SDG 13). For instance, achieving one goal frequently influences achieving another, demonstrating how interrelated the goals are. Goals like life below water (SDG 14) and life on land (SDG 15) are directly impacted by efforts to tackle climate change (SDG 13). Similarly, gender equality (SDG 5) is crucial for promoting health, economic growth, and social justice.

The SDGs remain highly challenging to achieve by 2030 despite the worldwide desire. The world is not on track to reach many of the goals, according to the UN Sustainable Development Report 2022. In other areas, progress has been reversed as a result of global crises like the COVID-19 pandemic, economic downturns, and geopolitical tensions (Stafford-Smith et al., 20217; Barbier & Burgess, 2020; Vyas-Doorgapersad, 2024). Consequently, there is an increasing need for data-driven insights to monitor and predict progress.



Figure 1. Sustainable Development Goals (SDGs).

Accurate monitoring is crucial to give policymakers the information they need to modify plans, distribute funds wisely, and pinpoint regions that most require intervention (Fukuda-Parr & McNeill, 2019). Since every country has a unique set of political, economic, and environmental circumstances, tracking progress towards the SDGs is much more difficult (OECD, 2017). These differences imply that while certain countries might be making steady progress towards their goals, others might lag behind or face significant obstacles. For example, low-income nations frequently have challenges related to inadequate data infrastructure and resources for tracking their development, which makes it challenging to quantify SDG achievement precisely. This discrepancy

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

highlights how crucial it is to use cutting-edge, data-driven strategies, including machine learning and predictive modelling, to more accurately assess and forecast SDG trends at the national and international levels (Elias et al., 2024). These methods can assist in navigating the complexity of the SDGs' interrelated nature and offer insights essential for well-informed, strategic decision-making by combining historical data and advanced algorithms.

This paper aims to use 1D Convolutional Neural Networks (1D-CNN) to create a sophisticated predictive model for predicting the SDG 1 (No Poverty) score. This study offers a strategic perspective on poverty reduction initiatives in various situations by forecasting the individual poverty scores for SDG 1 in China, Egypt, Saudi Arabia, Sweden, and the US. While China's large-scale implementation tactics in clean energy and poverty reduction offer insights from a significant developing economy (Yu et al., 2020; Lenkaitis, 2022).

Egypt's economic reforms and investments in renewable energy offer essential insights into advancing the SDGs in a rapidly rising area (Hussein & Pollock, 2019; El Baradei, 2020; Eissa, 2020). Saudi Arabia's Vision 2030, which emphasises infrastructure, economic diversification, and sustainable cities, aligns with several SDGs (AlArjani et al., 2021; Al-Mwzaiji & Muhammad, 2023). Sweden is a leader in sustainability. Thus, it provides a standard when comparing performance (Eliasson & Gr¨onlund, 2023; Palm, 2023). The USA's leadership in innovation, sustainable cities, and climate action reflects a developed-world approach (Lenkaitis, 2022).

These projections cover the years 2024–2030. 1D Convolutional Neural Networks (1D-CNNs) are especially well-suited for this study due to their efficacy in analysing temporal data. 1D-CNNs, in contrast to conventional convolutional networks made for image processing, are specifically made to handle sequential data, such time series. Historical socio-economic data from 2000 to 2022 serves as the basis for the model training dataset in this study. This historical data will teach the 1D-CNN to spot patterns and trends, which will then help it predict future SDG 1 results.

The structure of this paper is as follows: We begin with a review of related work to provide context and background. Following this, we describe the dataset and methodology employed in our study. Next, we present a detailed implementation of the 1D-CNN model, covering its design and training process. Finally, we showcase the results, including the model's performance metrics, such as training and validation loss, and provide the predicted SDG scores for 2024 to 2030 years.

2. Related Work

Predicting Sustainable Development Goal (SDG) scores has been a growing area of research in recent times, employing various methods to find trends and project results. This research falls into a few major categories that can be generally classified. Conventional regression models have been used to find correlations between SDG scores and predictor factors, providing information on how specific SDG targets might advance. For instance, forecasting future SDG results using linear regression models, which use historical data, is normal practice. Though these models offer a fundamental foundation for forecasting, they frequently need to be revised to handle the intricate, non-linear correlations present in SDG data. According to (Singh et al., 2024), linear models cannot adequately represent the complex interdependencies between various SDG objectives and factors and are essential for precise forecasting. The shortcomings of these conventional methods are emphasised by (Bennich et al., 2023), who point out that they cannot simulate the intricate relationships and temporal dynamics present in SDG data. This has prompted researchers to investigate more advanced techniques. Time series analytic methods have been used to simulate SDG score patterns over time, such as ARIMA (AutoRegressive Integrated Moving Average) and SARIMA (Seasonal ARIMA). These algorithms work very well for finding patterns and seasonal differences in SDG datasets. Li et al. (2023), for example, used these methods to predict SDG scores in different environmental settings, indicating how effective they are in capturing time-dependent aspects. Nevertheless, ARIMA and related models have several drawbacks, such as the potential to oversimplify the relationships between various SDG targets, particularly when handling numerous objectives and intricate interdependencies (Ramadan, 2024).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

Machine learning techniques have surfaced as a more adaptable and potent tool for SDG prediction in response to these difficulties. Large datasets have been managed, and non-linear interactions between SDG variables have been modelled using techniques like Random Forests and Gradient Boosting Machines. Compared to standard statistical models, these ensemble approaches produce more accurate and robust forecasts because they can handle complicated interactions between predictor variables (Kumar et al., 2023). Even so, there is still a chance that machine learning models will struggle to identify temporal connections and produce findings that make sense. According to Spathis and Kawsar (2024) tokenising and encoding temporal data for machine learning models has particular difficulties that frequently result in decreased interpretability and prediction accuracy.

Despite recent breakthroughs, many currently used models need to be revised to fully represent the temporal dynamics and developing patterns found in SDG data (Selin et al., 2023). More efficient models for the analysis of sequential and time-dependent connections are required. Moreover, research frequently concentrates on specific SDGs or aggregate indices, possibly needing more all-encompassing strategies that address several objectives simultaneously (Huffman et al., 2023). Furthermore, even though predicted accuracy using machine learning models has increased, interpretability and accuracy are frequently trade-offs (Jo et al., 2023). Models that strike a balance between these factors are required for use in actual policy-making.

Furthermore, a lot of research employs data with low granularity, which reduces forecast accuracy (Wang & Chang, 2023). Prediction accuracy may be improved by including more specific and granular data. Additionally, (Taweesan et al., 2024) used machine learning to forecast diarrheal illnesses in Asia and Africa due to inadequate sanitation. Using data from 1000 households, a classification tree model (J48) was used, and it achieved 73% accuracy. Personal hygiene and sanitation techniques like open defecation are essential components.

This analysis identifies several serious flaws in the SDG 1 forecasting methods, highlighting the need for more sophisticated approaches to handle these issues successfully. The intricate temporal patterns and dynamic interconnections that affect poverty levels are complex for many current models to reflect. Although traditional methods have advantages, they can lack the sophistication needed to comprehend the complex linkages and time-dependent elements included in data pertaining to poverty. To overcome these restrictions, this study attempts to present a fresh strategy using a 1D Convolutional Neural Network (1D-CNN) model. The 1D CNN is especially well-suited for examining poverty-related sequential and time-series data because of its capacity to recognise and extract patterns over time. In contrast to traditional models, which could oversimplify or ignore the delicate dynamics of poverty trends, the 1D-CNN offers a more nuanced forecasting method by utilising its deep learning capabilities to capture and analyse complex temporal relationships.

3. Proposed Model

The process used to create the prediction model for predicting SDG 1 (No Poverty) results is described in this section. It thoroughly explains all the steps needed, including data preprocessing, the 1D Convolutional Neural Network (1D-CNN) architecture, and the training process. The technology uses sophisticated machine learning algorithms to find intricate correlations and temporal trends in data connected to poverty to produce precise forecasts.

3.1. Data Collection and Preprocessing

The Sustainable Development Goals (SDG) index, accessible on Kaggle and spans 2000–2022, provided the dataset for this investigation. This extensive dataset offers a thorough summary of national and international progress made towards the UN's 17 Sustainable Development Goals (SDGs). The dataset includes various metrics that track several social, economic, and environmental goals. SDG 1 (No Poverty) stands out among them, with particular attention paid to indicators of poverty, economic inequality, access to essential services, and social security programs. To provide a more nuanced view of the difficulties and advancements associated with accomplishing SDG 1, the study will analyse this data to identify trends and patterns that can guide efficient

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

methods for reducing poverty. This dataset's richness and breadth allow for the use of cutting-edge machine learning methods, like the 1D Convolutional Neural Network (1D-CNN), to generate more precise forecasts of future trends in poverty.

Through computed scores, the data shows the progress made at the national and annual levels towards reaching SDG 1 (No Poverty). Specific indicators that analyse different aspects of social development and poverty reduction, such as per capita income, health outcomes, educational access, social safety nets, and environmental sustainability measures, are used to evaluate each SDG aim. These various ratings are combined to determine each nation's overall SDG Index score, which offers a thorough picture of its performance regarding the global goals for reducing poverty. Several preprocessing techniques were used to prepare the data for sequential modelling before training the 1D Convolutional Neural Network (1D-CNN) model. The collection includes SDG scores that differ by nation and goal. MinMax scaling was used to increase the model's effectiveness and guarantee consistency. All SDG scores, including the overall SDG Index, are rescaled to a range of 0 to 1 via this transformation. The method avoids features with more comprehensive numeric ranges from unduly impacting learning by normalising the values, which speeds up convergence during model training. This scaling was applied to the dataset for each nation using the MinMaxScaler function from the sklearn library. This scaling technique reduces the possibility that more significant magnitude values will obscure smaller ones in the learning process by guaranteeing that each SDG target and the SDG Index score contribute equally to the model's training. Ultimately, this preprocessing stage strengthens the predictive model's resilience, enabling a more precise evaluation of the advancement in the fight to end poverty.

3.2. Feature Selection

The data used in this study includes both individual and index scores for SDG 1 (No Poverty) and the whole dataset for all 17 SDGs. This vast dataset is a vital tool for assessing and projecting advancement towards the SDG framework of the UN, especially when tackling the pressing problems associated with poverty reduction. The dataset is arranged in a number of important columns, each of which offers crucial information for analysis:

- Country code: Each country is given a unique alphanumeric number, making cross-national comparisons and effective data management easier. It is essential for guaranteeing the integrity and consistency of data, particularly when combining various data sources.
- Country: To assist researchers in placing the data in a geographical and cultural context, this column provides a list of the names of the nations represented in the dataset. Interpreting the differences in attempts to reduce poverty and promote the SDGs requires understanding these circumstances.
- Year: Any time-series analysis must incorporate a temporal component. By indicating the year to which the data relates, this column makes it possible to analyse trends and evaluate how scores connected to poverty have changed over time. It enables scholars to assess the effects of particular policies or world events and determine the relative advantages of short- and long-term development plans.
- SDG Index Score: A country’s overall achievement in accomplishing the 17 SDGs is reflected in this composite score. By offering a single indicator that captures a country’s accomplishments, it makes comparisons easier both within and between nations. Finding out which nations are ahead or behind in sustainable development projects, such as reducing poverty, is made easier with the help of the SDG Index score.
- Goal 1 Score: This particular score evaluates how well a country is doing concerning SDG 1 (No Poverty). It includes a number of metrics pertaining to social safety programs, poverty levels, and access to essential services. This score's granularity makes it possible to analyse a nation's poverty reduction plans in great depth, highlighting its advantages and disadvantages in reaching SDG 1.

The need to comprehend the general and particular aspects of sustainable development motivated the adoption of SDG index scores and individual goal scores for SDG 1 (No Poverty). Researchers can rapidly evaluate overall progress in reducing poverty and spot macro trends by examining the SDG index score. On the other hand, the individual target scores offer a thorough analysis of specific metrics, emphasising the difficulties and successes related to poverty alleviation initiatives in diverse settings. Additionally, knowing how several targets interact can highlight possible trade-offs and synergies, essential for creating policies that effectively reduce

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

poverty. For predictive modelling, the dataset's time-series component is essential. The study can find patterns and trends in past data that help predict SDG 1 results in the future. This predictive power is crucial for stakeholders hoping to foresee challenges and spot opportunities in the fight to eradicate poverty by 2030. In conclusion, this dataset is an essential tool for assessing SDG 1 progress and directing strategic and policy decision-making, eventually advancing the larger objective of sustainable development.

3.3 Model Architecture

Using sequential data, this study used a one-dimensional convolutional neural network (1D-CNN) model to predict scores for Sustainable Development Goal 1 (No Poverty). To provide insights into possible trends and support policymakers in their strategic planning for poverty alleviation, the model forecasts future SDG 1 index scores and individual target scores using historical data. As seen in Figure 2, the architecture comprises convolutional layers, pooling layers, and fully linked dense layers specially made for time-series data. Below, we thoroughly explain each model layer and its unique role in the forecasting process.

1. Input Layer: Sequences with the shape (None, 377, 1) make up the model's input. The single feature dimension represents the time-series data under analysis, and 377 denotes the number of time steps.
2. Convolutional Layers: Conv1d 6, the architecture's initial layer, is a one-dimensional convolutional layer that applies 64 filters using ReLU (Rectified Linear Unit) activation functions across the time axis. This layer's objective is to identify regional patterns or trends in the input sequence. This layer's output is shaped like (None, 375, 64), where 64 is the number of filters, and 375 is the number of time steps that the kernel size has dropped.
3. Similar in theory to the first convolutional layer, the second convolutional layer (Conv1d 7) has 128 filters, which helps the model learn higher-level and more abstract representations. This layer produces the form (None, 185, 128).
4. Pooling Layer: A MaxPooling layer comes after each convolutional layer to lower the dimensionality and computational cost. MaxPooling (max pooling1d 6 and max pooling1d 7) chooses the highest value in a sliding window to minimise the time steps. The most critical information is preserved, although the temporal resolution is reduced with this technique. For instance, the time steps are cut in half to 187 after the first pooling process and again to 92 after the second pooling procedure.
5. Flattening Layer: The flatten 3 layer flattens the resulting 2D tensor of shape (None, 92, 128) into a 1D vector with 11,776 elements following the convolution and pooling processes. This operation is required to move from the convolutional portion of the model to the fully connected dense layers.
6. Dense Layers: The dense layers learn the intricate correlations between the extracted features. There are 128 neurones in the first completely linked layer (dense 6), each with a ReLU activation function. Essential features for the prediction job are captured in a lower-dimensional space by mapping the high-dimensional flattened vector using the dense layer. A dropout layer (dropout 1) with a rate of [specify the dropout rate, e.g., 0.5] is placed after the dense layer to avoid overfitting. By randomly deactivating neurons during training, dropout regularisation lessens the model's reliance on particular neurons and improves generalisation.
7. Output Layers: The last layer, called dense 7, has 17 neurons, a linear activation function, and is fully connected. Based on the predictions, each neuron generates the anticipated score for one of the 17 targets, which corresponds to the Sustainable Development Goals (SDGs). The number of expected values for each sample is reflected in the output shape (None, 17).

80% of the dataset was used to train the model, and the remaining 20% was reserved for validation. This division makes sure the model gains knowledge from a significant amount of data while enabling efficient assessment of its performance on data that has not been seen yet. We also used batch processing, which separates the data into smaller batches or subsets. This strategy introduces stochasticity, which can aid in escaping local minima in the loss landscape and improve the model's convergence while expediting the training process. The adaptive moment (Adam) is the optimisation used in the proposed model, with the mean absolute error (MAE) loss function and root mean squared error (RMSE) as goals. Adam can adaptively learn the required parameters based on the learning process (see Table 1).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

MAE measures the average difference between the actual and predicted values, and the root square of the average of the squared differences between the actual and predicted values is known as RMSE. These can be stated as follows:

$$MAE = \frac{\sum_{j=1}^{n} |y_j - x_j|}{n} \quad (1)$$

$$RMSE = \sqrt{\frac{\sum_{j=1}^{n} (y_j - x_j)^2}{n}} \quad (2)$$

where n is the total number of data points that were recorded, x_j is the expected value, and y_j is the actual value.

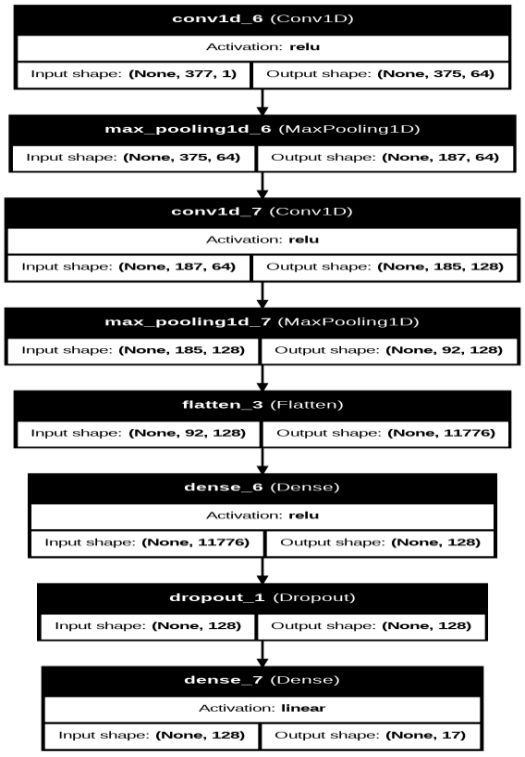


Figure 2. Proposed deep learning model

The next part discusses the experiments that were carried out to create, verify, and test the suggested model. We used 200 epochs for the training phase, which is sufficient to allow the model to identify complex patterns in the data while reducing the possibility of overfitting. The training dataset is completely traversed throughout each epoch, enabling the model weights to be changed to minimise the loss function. To ensure the model maintained its capacity for generalisation, which eventually improved its predicted accuracy on unknown data, we kept a careful eye on both training and validation losses. Using historical data from the previous three years as the time step, the model was specifically created to anticipate SDG 1 scores for the years from 2024 to 2030. The UN's 2030 timeframe for accomplishing the Sustainable Development Goals is in accordance with this anticipated horizon. The model may reflect current trends and oscillations in efforts to reduce poverty using a three-year time step, giving the projections pertinent context. Using data from the preceding three years, the system can identify patterns and shifts in SDG 1 scores that will likely affect future results.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

Table 1. 1D-CNN Model Parameters for SDG Forecasting.

Parameter	Value
Time Step	3
Batch Size	50
Epochs 200	200
Learning rate	0.001
Dropout rate	0.5
Filters (Layer 1)	64
Filters (Layer 2)	128
Kernel Size	1
Pooling Size	2
Validation Split	0.2
Min-Max Scaling Range	(-1, 1)
Optimizer	Adam
Loss Function	Mean Squared Error
Metrics	Mean Absolute Error
Training-Testing Split	80-20
Prediction Years	2024-2030

Focusing policy interventions and resource allocation on areas where poverty alleviation is falling behind enables stakeholders to make well-informed decisions based on predicted trends. Additionally, the model's output can assess how well-suited current plans and programs are to accomplishing SDG 1, which will ultimately result in more targeted and significant attempts to reduce poverty sustainably.

4. Results and Discussion

The results of the one-dimensional Convolutional Neural Network (1D CNN) model that was used to predict future SDG 1 scores are shown in this section. Training and validation datasets are used to assess the model's performance, focusing on how well it can generalise and forecast poverty reduction outcomes for 2024–2030. We review the model's main findings, evaluate how these projections might affect upcoming sustainable development projects, and contrast the expected SDG 1 scores with past patterns. The results are placed in the context of real-world uses, emphasising how the model's predictions might guide strategic planning and policy choices in the battle against poverty. Furthermore, we display the association coefficients between SDG 1 scores and other pertinent metrics in a correlation matrix. As seen in Figure 3, a correlation coefficient measures the degree and direction of a linear link between two variables. SDG 1 scores have strong positive correlations with a number of other SDGs, according to the correlation matrix, highlighting the connection between efforts to reduce poverty and more general development objectives. For example, a strong correlation of 0.84 is seen between SDG 1 (No Poverty) and SDG 4 (Quality Education), indicating that countries that successfully reduce poverty are also likely to improve the quality of education. Policymakers can use the correlation matrix's insights to create plans that concurrently target several SDGs. Given their close ties, a nation concentrating on accomplishing SDG 1 should think about directing resources towards SDG 4. By guiding resource allocation to optimise benefits across several development goals, policymakers can also find possible trade-offs and synergies by understanding these relationships. Additionally, this matrix shows interesting associations that need more research to understand the underlying causes of these correlations.

The 1D-CNN model's training and validation loss curves, shown in Figure 4, are essential for assessing the model's functionality and spotting possible problems like overfitting. The blue curve shows the model's performance on the training data, and the orange curve shows its performance on the validation data—which is excluded during training to evaluate generalisation. A notable reduction in training and validation loss throughout the early epochs suggests that the model is learning efficiently. The validation loss, however, might plateau or even rise as the number of epochs increases, indicating that the model might be starting to overfit to the training set, even though the training loss is decreasing. Since the validation loss does not significantly rise compared to the training loss, the curve shapes show that the model has reached a suitable degree of training without experiencing severe overfitting. Based on these loss curves, the 1D-CNN model shows potential in predicting future SDG 1 scores. The comparatively constant validation loss shows that the model can

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

successfully apply the knowledge it has gained from the training set to new data, demonstrating its capacity to generalise to new data. However, additional validation using a separate test dataset is required to fully evaluate the model's overall efficacy. Even though the loss curves indicate that the 1D-CNN model does a good job of predicting SDG 1 scores, more testing and improvement are necessary to guarantee its resilience and pinpoint areas needing development.

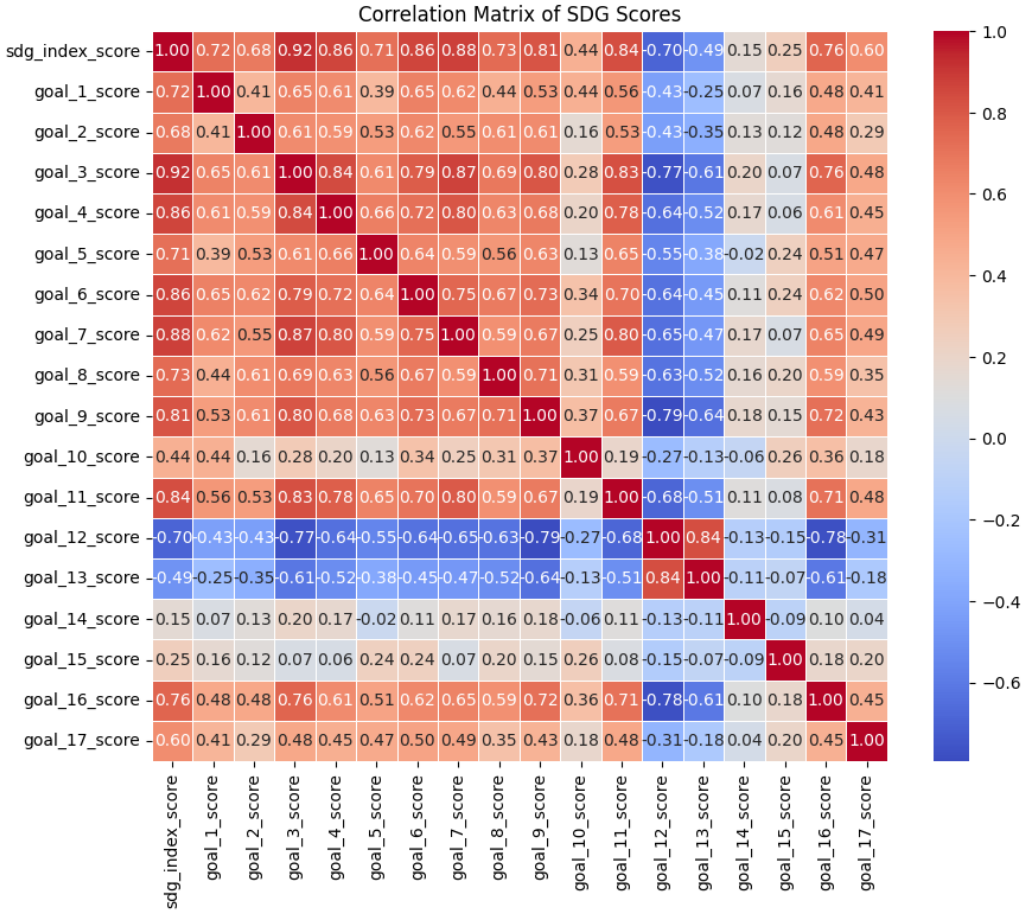


Figure 3. Correlation coefficients between the various SDG scores.

Forecasting Sustainable Development Goal 1 (SDG 1) scores are shown in Figure 5 to demonstrate the efficacy of the suggested methodology. The actual (historical) SDG 1 scores and the expected scores over different time steps are contrasted in each subplot. These time phases could include anticipating years in the future and training years in the past. The individual SDG 1 scores are displayed on the y-axis, most likely normalised within a predetermined range (e.g., 0 to 1). The red line shows the expected SDG 1 scores calculated by the 1D-CNN model.

Conversely, the blue line shows the actual SDG 1 scores, which either reflect historical data or act as a baseline for the forecasts. The close alignment of the red (predicted) and blue (actual) lines indicates that the model has a high capacity for prediction. The model's ability to accurately depict the underlying trends and patterns in the SDG 1 time series is demonstrated by its tight tracking. Some differences may occur, indicating that the model has trouble predicting specific values, even though most subplots show strong performance with little error between anticipated and actual scores. Because the model uses historical data as a time step to capture past associations and apply them to future forecasts effectively, the results highlight the significance of taking time-dependent patterns into account. Overall, the figure shows how well the model predicts SDG 1 scores, with most subplots showing high accuracy since the expected and actual values closely match. These findings can help stakeholders and policymakers make data-driven decisions and plan actions by giving them insights into expected future trends in poverty eradication, even though some variances may need more work.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

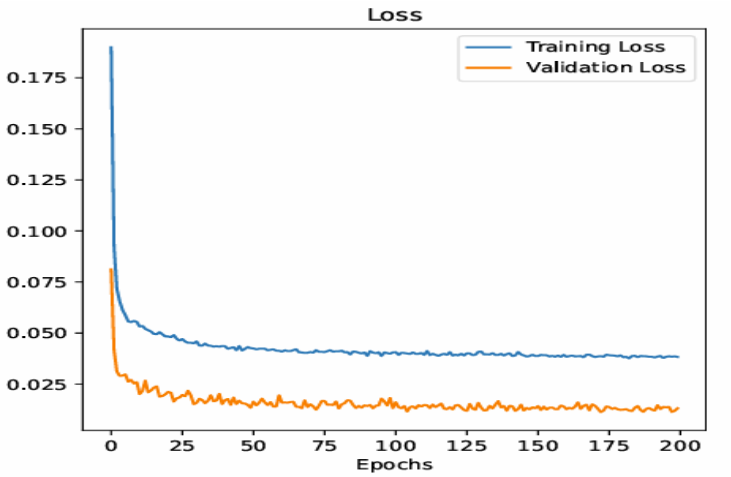


Figure 4. The training and validation loss curves for a 1D-CNN model.

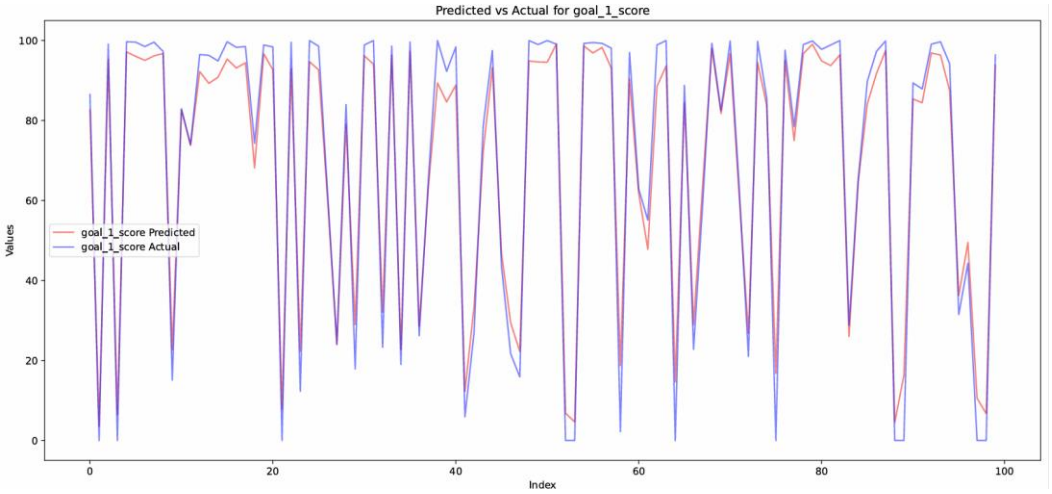


Figure 5. Comparison of actual and predicted SDG1

The Sustainable Development Goal (SDG) 1 scores for five significant nations—China, the US, Sweden, Saudi Arabia, and Egypt—for the years 2024–2030 are shown in this section. These countries were chosen because of their distinct methods for reducing poverty, varied socio-economic backgrounds, and different approaches to development. This analysis attempts to thoroughly grasp international efforts to end poverty by looking at nations from various geographical areas and with varying degrees of economic development. With a focus on social welfare and sustainable development, China, an economy expanding quickly, has made significant investments in efforts to reduce poverty. A distinct viewpoint is provided by the US, which strongly emphasises community-based initiatives and innovative social safety nets that try to lower poverty among underserved groups. Consistently praised for its extensive welfare system and high living conditions, Sweden exhibits successful policies that advance social justice and assistance for marginalised communities. Through its Vision 2030 plan, which includes measures to increase economic diversification and improve social services to lower poverty levels, Saudi Arabia is attempting to achieve SDG 1. Egypt, a rising country, is aggressively enacting reforms centred on access to essential services and economic inclusion to combat poverty.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

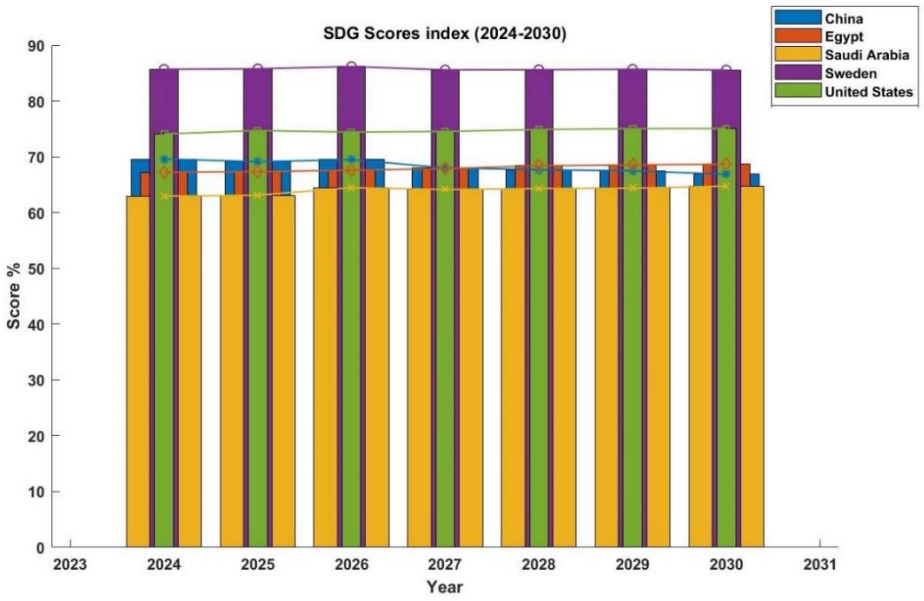


Figure 6. Predicted SDG Index Scores (2024-2030).

The Sustainable Development Goal (SDG) 1 Index Scores for China, Egypt, Saudi Arabia, Sweden, and the US are expected from 2024 to 2030 and are shown in Figure 6. With ratings above 80%, Sweden continuously performs best, demonstrating its advanced efforts in social welfare, poverty alleviation, and fair access to essential services. Although there are issues with addressing income inequality and access to social safety nets, the United States performs steadily, with scores ranging from 75% to 80%, showing consistent improvement in reducing poverty. Saudi Arabia, Egypt, and China all show comparable patterns, with scores between 65% and 75%. These rankings demonstrate the continuous efforts made in these nations to fight poverty using a range of measures, such as targeted poverty reduction programs, social service improvement, and economic diversification. These countries show steady progress, especially in raising living standards and expanding access to healthcare and education, even though their rankings are marginally lower than those of Sweden and the US. This graphic comparison highlights the differences in international efforts to accomplish SDG 1 and offers information on regional opportunities and difficulties that could affect the goal of ending poverty by 2030.

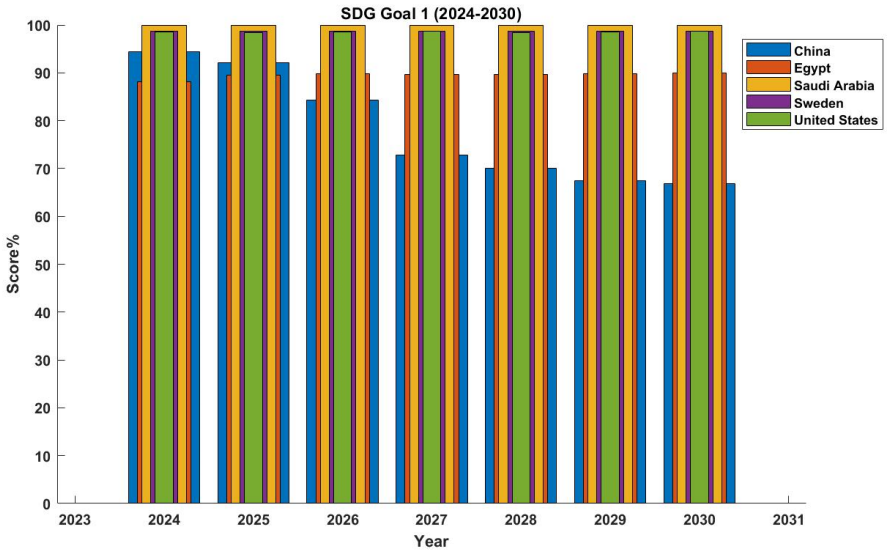


Figure 7. SDG Goal 1 (2024-2030).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

The progress made by five nations—China, Egypt, Saudi Arabia, Sweden, and the United States—in achieving Sustainable Development Goal 1 (No Poverty) between 2024 and 2030 is graphically depicted in the bar chart shown in Figure 7. While the y-axis shows each country's percentage score for a given year, indicating its progress in reducing poverty, the x-axis depicts the historical timeframe, highlighting the years 2024–2030. The relative progress made in eradicating poverty can be assessed by comparing the heights of the bars for each country. The graph shows clear patterns in each nation's development, showing that whilst some have consistently made progress towards SDG 1, others have encountered major challenges. For example, Sweden's score has been steadily rising, which indicates the success of its robust economic policies, extensive social safety programs, and dedication to lowering inequality. The nation's strategy ensures that vulnerable populations receive sufficient help by integrating multiple areas, including social protection, healthcare, and education.

On the other hand, the pattern in the US is more erratic, with periods of advancement interspersed with periods of stagnation. The success of programs aimed at reducing poverty may be hampered by persistent issues like growing economic disparity and limited access to social safety nets, which this variability may indicate. The upward trend in China's bar chart highlights the country's significant efforts in social services, job creation, and rural development to rescue millions of people from poverty. The score shows there are still issues, especially when resolving the gaps between urban and rural communities. Saudi Arabia and Egypt show comparable trends, with scores rising moderately over time. Both nations have implemented specific measures to reduce poverty, like economic diversification plans and social safety nets. However, they still have issues with resource allocation and economic stability, which could hinder their capacity to make meaningful development by 2030. Overall, the graph highlights the various tactics and laws used to fight poverty and shows the five nations' differing levels of success. By analysing these variations, interested parties can learn essential lessons about what works and what needs to be improved, which will eventually direct future initiatives to end poverty worldwide.

Conclusion

The present research uses a robust time series forecasting model based on a one-dimensional Convolutional Neural Network (1D-CNN) to correctly project the Sustainable Development Goal 1 (No Poverty) scores for the years 2024 to 2030. The analysis's main subjects are the United States, Sweden, Saudi Arabia, Egypt, and China. Using deep learning techniques, the model leverages temporal connections in historical data from 2000 to 2022 to correctly estimate each country's progress towards eradicating poverty. The findings highlight the model's capacity to recognise and assess trends in poverty alleviation, allowing for accurate forecasts that correspond with expected worldwide trends in sustainable development. The methodology guarantees that the results are firmly rooted in the dynamics of historical performance connected to poverty reduction activities by limiting forecasts within a feasible range of 0 to 100. Apart from augmenting our comprehension of the diverse routes that culminate in eliminating poverty, this research offers significant perspectives for global organisations, interested parties, and governments committed to promoting programs to reduce poverty. The model is an essential tool for decision-makers, enabling nations to make well-informed decisions about the distribution of resources and calculated actions meant to accomplish SDG 1. To improve the precision and applicability of poverty estimates, future studies could expand on these findings by incorporating other socio-economic factors or investigating different modelling approaches. This could result in a more sophisticated comprehension of the potential and difficulties in ending poverty worldwide.

References

AlArjani, A., Modibbo, U.M., Ali, I., & Sarkar, B. 2021. A new framework for the sustainable development goals of Saudi Arabia. *Journal of King Saud University – Science*, 33(6), 101477. https://doi.org/10.1016/j.jksus.2021.101477

Al-Mwzaiji, K.N.A., & Muhammad, A.A.S. 2023. EFL learning and Vision 2030 in Saudi Arabia: A critical perspective. *World Journal of English Language*, 13(2). https://doi.org/10.5430/wjel.v13n2p435

Barbier, E.B., & Burgess, J.C. 2020. Sustainability and development after COVID-19. *World Development*, 135, 105082. https://doi.org/10.1016/j.worlddev.2020.105082

Bennich, T., Persson, ˚A., Beaussart, R., Allen, C., & Malekpour, S. 2023. Recurring patterns of SDG interlinkages and how they can advance the 2030 Agenda. *One Earth*, 6(11), 1465-1476. https://doi.org/10.1016/j.oneear.2023.10.008

Eissa, N. 2020. Egypt within the sustainable development goals one and two of the United Nations: overview and recommendations thereof. *Research in World Economy*, 11(5). https://doi.org/10.5430/rwe.v11n5p420

El Baradei, L. 2020. Politics of evidence-based policy making: Report ing on SDG 16 in Egypt. *International Journal of Public Administration*, 43(5), 425-440. https://doi.org/10.1080/01900692.2019.1668414

Elias, O., Esebre, S.D., Abijo, I., Timothy, A.M., Babayemi, T.D., Makinde, E.O., Oladepo, O.I., & Fatoki, I.E. 2024. Harnessing artificial intelligence to optimise financial technologies for achieving sustainable development goals. *World Journal of Advanced Research and Reviews*, 23(2), 616-625. https://doi.org/10.30574/wjarr.2024.23.2.2385

Eliasson, A., & Gr¨onlund, E. 2023. SDG interactions from a regional per spective: a case study from Sweden. In: Interlinkages between the Sus tainable Development Goals, pp. 259. https://doi.org/10.4337/9781803924946.00017

Fukuda-Parr, S., & McNeill, D. 2019. Knowledge and politics in setting and measuring the SDGs: Introduction to special issue. *Global Policy*, 10, 5-15. https://doi.org/10.1111/1758-5899.12604

Huffman, M., Wang, Q., & Khan, F. 2023. Analysis of sustainability metrics from a process design and operation perspective. *Process Safety and Environmental Protection*, 177, pp. 1351-1365. https://doi.org/10.1016/j.psep.2023.08.001

Hussein, A.A.A., & Pollock, E. 2019. Sustainable development approaches in Egypt. In: IOP Conference Series: Earth and Environmental Science, Vol. 297, No. 1, p. 012027. IOP Publishing. https://doi.org/10.1088/1755-1315/297/1/012027

Jo, N., Aghaei, S., Benson, J., Gomez, A., & Vayanos, P. 2023. Learning optimal fair decision trees: Trade-offs between interpretability, fairness, and accuracy. In Proceedings of the 2023 AAAI/ACM Conference on AI, Ethics, and Society, pp. 181-192. https://doi.org/10.1145/3600211.3604664

Kumar, V., Kedam, N., Sharma, K.V., Mehta, D.J., & Caloiero, T. 2023. Advanced machine learning techniques to improve hydrological prediction: A comparative analysis of streamflow prediction models. *Water*, 15(14), 2572. https://doi.org/10.3390/w15142572

Lenkaitis, C.A. 2022. Integrating the United Nations' sustainable de velopment goals: Developing content for virtual exchanges. https://doi.org/10.1515/9783110727364-011

Li, G., Pan, Z., Qi, Z., Wang, H., Wang, T., Zhao, Y., Zhang, Y., Li, G., & Wang, P. 2023. Hybrid forecasting system considering the influence of seasonal factors under energy sustainable development goals. *Measurement*, 211, 112607. https://doi.org/10.1016/j.measurement.2023.112607

Naciones Unidas. 2022. The Sustainable Development Goals Report 2022. United Nations Publications.

OECD. 2017. Measuring Distance to the SDG Targets: An assessment of where OECD countries stand. Paris: OECD Statistics.

Palm, V. 2023. Patterns of sustainability and policy coherence: some lessons learned from Sweden and global SDG follow-up. In: Interlinkages between the Sustainable Development Goals, pp. 52-69. Edward Elgar Publishing. https://doi.org/10.4337/9781803924946.00009

Ramadan, M.S., Abuelgasim, A.A., & Al Hosani, N. 2024. Advancing air quality forecasting in Abu Dhabi, UAE using time series models. *Frontiers in Environmental Science*, 12, 1393878. https://doi.org/10.3389/fenvs.2024.1393878

Vyas-Doorgapersad, S. 2024. Transition towards eradication of poverty in Africa. *Insights into Regional Development*, 6(2), 78-91. https://doi.org/10.9770/IRD.2024.6.2(5)

Funding: The authors extend their appreciation to Princess Nourah bint Abdulrahman University Researchers Supporting Project number (PNURSP2024R705), Princess Nourah bint Abdulrahman University, Riyadh, Saudi Arabia.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/b8436764898

Data Availability Statement: The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.

Author Contributions: Conceptualisation, *R.A.O.*; Data curation, *R.A.O.*; Formal analysis, *R.A.O.;* Investigation, *R.A.O.;* Methodology, *R.A.O.*; Resources, *G.T., W. S., A.A.E.,* and *R.A.O.* and *A.A.E.-B.*; Software, *R.A.O.*; Validation, *R.A.O.*; Visualization, *R.A.O.*; Writing—original draft, *R.A.O.*; Writing—review & editing, *G.T., W. S., A.A.E.* and *R.A.O.* All authors have read and agreed to the published version of the manuscript

Ghada ALTURIF
ORCID ID: https://orcid.org/0000-0003-3997-3523

Wafaa SALEH
ORCID ID: https://orcid.org/0000-0003-4143-7084

Alaa A EL-BARY
ORCID ID: https://orcid.org/0000-0002-8846-0487

Radwa Ahmed OSMAN
ORCID ID: https://orcid.org/0000-0003-3663-0103

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

Publisher
http://jssidoi.org/esc/home

CATEGORISATION OF EU COUNTRIES IN TERMS OF THE IMPACT OF CRISIS PERIODS ON VALUE-ADDED TAX*

Zuzana Bobček [1], Alena Andrejovská [2]

[1,2] Technical University of Košice, Faculty of Economics, B. Němcovej 32, 040 01 Košice, Slovak Republic

E-mails: [1]zuzana.bobcek@tuke.sk; [2] alena.andrejovska@tuke.sk

Received 18 August 2024; accepted 30 November 2024; published 30 December 2024

Abstract. The categorisation of EU countries based on their reactions and approach to value-added tax (VAT) during crisis periods can be divided into several groups according to how countries responded to crises such as economic recessions or the COVID-19 pandemic. The responses of individual countries included adjustments to VAT rates, the introduction of tax incentives, payment deferrals and other measures to mitigate the impact of the crisis on the economy. The present research focuses on identifying, analysing and evaluating the impact of crises on VAT. Its main objective is to develop an economically meaningful categorisation of EU countries based on the level of the basic VAT rate and macroeconomic and institutional indicators. We included gross domestic product, population, unemployment, inflation and international trade among the macroeconomic indicators. Further, the paper uses institutional indicators of government effectiveness and more narrowly focused indices such as control of corruption and legislation. The classification of countries is divided into three periods 2004, 2008 and 2020. The crisis periods 2008 (global financial crisis) and 2020 (pandemic crisis) are compared with the base period 2004 in the research. The analysis is complemented by the evolution of rates and the incidence of applied measures in the European Union countries under study. The categorisation of countries was carried out on the 28 member countries, considering the actuality of membership in the year under review. To categorise groups of countries within the European Union, we used four analysis methods: rate change analysis, principal component analysis, correlation analysis and cluster analysis of hierarchical type (Ward method). The research results show a significant impact of crisis periods on the categorisation of countries. Despite the crisis periods, the most developed EU economies have maintained their economic growth in contrast to other countries. This is evidenced by the fact that the cluster analysis method separated them into a distinct cluster in each period under study. The research further showed that EU Member States applied changes to their tax rates on goods and services mainly after the global financial crisis. During the pandemic crisis, it became apparent that measures other than a change in the basic tax rate were applied. These measures are mainly adjustments to reduced tax rates, financial incentives, employer support, etc. In particular, the use of reduced tax rate adjustments and support to employers through wage cost recovery has proven to be an effective way of increasing tax revenue and a form of assistance.

Keywords: value-added tax; standard tax rates; cluster analysis; correlation; Ward's method

Reference to this paper should be made as follows: Bobček, Z., Andrejovská, A. 2024. Categorisation of EU countries in terms of the impact of crisis periods on value-added tax. *Entrepreneurship and Sustainability Issues*, 12(2), 414-428. http://doi.org/10.9770/e7945435485

JEL Classifications: H21

1. Introduction

Value-added tax is one of the most important sources of tax revenue for most EU governments. It is part of any taxation policy and significantly influences consumer and government behaviour. Value-added tax changes are perceived as harmful as they directly affect household budgets. Significant adverse impacts include global

* *This paper is a part of research project of the Ministry of Education, Family and Sports of the Slovak Republic VEGA project No. 1/0638/22 Intellectual capital and regional productivity*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

crises, which have recently increased in frequency. Periods of economic and pandemic crises have had a significant effect on the functioning of European economies and their macroeconomic development in recent years. In such crises, it is up to the countries to react correctly. However, the experience of crises suggests that it is precisely the increase in the tax burden on consumers that is taking place to a greater extent. The negative effects on consumers may, in turn, impact society and its perception of the state. The monitoring of institutional indicators and macroeconomic indicators can demonstrate the fact that indirect taxation is very important. From a macroeconomic perspective, VAT broadly impacts a country's economy. It is a crucial source of government revenue but also affects consumption, inflation, unemployment, economic growth and competitiveness. Getting the tax burden right can help governments address macroeconomic challenges and ensure long-term economic prosperity.

On the other hand, institutional indicators of VAT assess the efficiency, transparency, and fairness of the administration and collection of this tax. VAT is an important source of revenue for countries, and its proper functioning depends on the quality of the institutions that administer it. These indicators look at how well the state manages the VAT system, reduces tax evasion and ensures a fair burden on taxpayers. Our research was targeted to reveal the impact of crisis periods on VAT rates and their impact on the categorisation of EU countries.

2. Theoretical background

The determinants of the value-added tax are mainly national macroeconomic development indicators and, to a lesser extent, indicators used from the perspective of institutional development. From a macroeconomic perspective, a study by Castro and Camarillo (2014) confirms that if a country has a higher gross domestic product, lower foreign direct investment and a more widespread level of industry, the economy can achieve higher tax revenues to the country. In the context of the standard of living in countries, many are concerned about its direct impact when introducing a value-added tax. According to Alavoutunka, Happen and Pirttlä (2019), the introduction of this type of tax has not significantly impacted the change in the population's standard of living. Concerns related to an increase in inequality in the country have not been demonstrated, and therefore, the impact of VAT on living standards is insignificant.

A study by Acosta-Ormaechea and Morozumi (2021) focusing on the economic growth of OECD countries traced that an increase in VAT results in an increase in economic growth only under the condition of an increase in the efficiency of tax collection, the so-called C - efficiency. The authors also pointed out that a reduction in the applied basic tax rate can offset an increase in the efficiency of tax collection. This compensation would increase the population's purchasing power, supporting increased economic growth to a greater extent through increased tax revenues. On the other hand, VAT would also positively impact economic growth theoretically if the efficiency of tax collection and collection were increased. According to another study by Andrejovská and Helcmanovská (2021), a change in the basic rate results in a negative impact on the economic development of a country in the short run. It mainly points to a slowdown in economic growth.

In the long run, the impact of a change in the basic tax rate is perceived more positively. The accumulation of tax revenues in the national budget of economies will help to build up reserves in the event of a crisis. Household consumption is often associated with VAT. A study by Alm and El-Ganainy (2013) highlighted VAT's effectiveness. The results confirmed that the use of VAT in a country's tax system results in a reduction in household consumption. Another indicator from the group of macroeconomic indicators is the determinant of unemployment. Unemployment was not confirmed to impact VAT use efficiency significantly in the study.

A negative result in the context of the impact of unemployment growth on economic growth through VAT was obtained in a scientific study by Acosta-Ormaechea and Morozumi (2021), Urbancová and Hudáková (2015). Increasing levels of unemployment result in a reduction in tax revenues from goods and services, which, in turn, negatively affects the economic growth of countries. Another important indicator is inflation. According to Alm and El-Ganainy (2013), inflation has a positive relationship with VAT. The positive relationship was equally confirmed in a study by Limberg (2022) focusing on fiscal pressure. In the long run, rising inflation impacts the

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

fraudulent behaviour of the population. Another important determinant of value-added tax is international trade. This determinant in relation to VAT was pointed out in a study by Johnson and Noguera (2012). According to its authors, the inadequacy and inaccurate reporting of mainly imported services between countries was confirmed. This confirmed the negative influence between international trade and VAT. From a macroeconomic perspective, Limberg (2022) points out the importance of this indicator. He argues that countries with democratic political regimes use VAT as a tool to increase the efficiency of taxation in times of crisis. The most common way is to broaden the base of the basic tax rate, which affects the country's largest group of goods and services. At the same time, the author comments on corruption in public administration and confirms the general statement about the negative impact of corruption on the efficiency of VAT.

3. Research objective and methodology

The paper aims to assess the impact of the crises on the change in the distribution of the surveyed countries in the context of value-added tax. This impact on macroeconomic and institutional development indicators has been examined. The paper aimed to answer the research question: "Did the crisis period in the economy have an impact on the change of the value-added tax rate?" The research included rate change analysis, correlation analysis, principal component analysis, and cluster analysis. The correlation analysis consisted of testing the analysed data to ensure its independence. Using principal component analysis, we adjusted the selected data into two groups of components. The theoretical basis of PCA analysis comes from Abdi and Williams (2010). The next part of the research consists of applying cluster analysis using the hierarchical method, while we used the most used Ward'sWard's method. The theoretical base comes from Kráľ and et. Al (2009) and Labudová (2021). Cluster analysis was performed for each observation period separately. The results of the cluster analysis were then compared.

For the analysis, annual data of the European Union countries for the period 2000-2021 are used. Data were drawn from the European Commission, the World Bank, the OECD and DataFinder databases. From the selected period, the analyses mainly focus on the crisis periods of 2008 (global financial crisis) and 2020 (pandemic crisis). The results of the crisis periods were then compared with 2004. The countries analysed are the Member States of the European Union. Specifically: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Sweden and the United Kingdom. In each of the years under review, emphasis was placed on the validity of membership in the year under review.

The choice of determinants (Table 1) was heavily influenced by Castro and Camarillo (2014), Acosta-Ormaechea and Morozumi (2021), Andrejovská, Helcmanovská (2021), Alm and El-Ganainy (2013), Morrow, Smart and Swistak (2022), Johnson and Noguera (2012), and Limberg (2022). With the rule, the authors have focused on examining value-added taxes from the perspective of various macroeconomic indicators. Limberg (2022) was the only one of these authors who analysed the topic of value-added tax from the perspective of selected indices.

Table 1. Overview and Description of Variables

Variable	Unit	Label	Source	Description
Standard rates	%	STR	European Commission	Tax is applied to the value-added of goods and services sold within the territory of a country.
Macroeconomics Variables				
Gross domestic product per capita	$	GDPpc	World Bank	Gross domestic product based on purchasing power parity per capita.
Population	Total number	POP	World Bank	Total population with nationality of the country.
Unemployment	%	UNE	World Bank	Proportion of the labour force that is unemployed and looking for work.
Inflation	%	INF	World Bank	The annual percentage change in the consumer's cost of acquiring goods and services.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

International trade	Billions of dollars	TOGC	OECD	Net trade in goods and services representing transactions between residents and non-residents.
Institutional Variables				
Index of globalisation	<0-100>	KOF	DataFinder	Government'sGovernment's ablitiy to effectively formulate and implement sound economics.
Government Effectiveness	<-2,5 – 2,5>	GE	World Bank	Degree of independence from political pressures and the clauses of policy formulation. The quality of public government services.
Regulatory Quality	<-2,5 – 2,5>	RQ	World Bank	The ability of the government to formulate and implement regulations that promote development in the economy.
Rule of law	<-2,5 – 2,5>	ROL	World Bank	Level of private sector trust in compliance with social rules.
Control of Corruption	<-2,5 – 2,5>	COC	World Bank	Perceptions of the extent to which public power is used to benefit private interests.

Source: Own processing

We tested the expected relationships between the selected determinants of Table 2 with the results of empirical studies.

Table 2. Expected Impact of Selected Variables on Value-Added Tax

Author, Year	Variable	Relationship between Dependent and Independent Variables	Expected Relationship
Castra, Camarillo (2014)	**GDPpc**	positive	+
Acosta-Ormaechea & Morozumi (2021)		positive	
Limberg (2022)	**POP**	positive/negative	+
Alm & El-Ganainy (2013)	**UNE**	positive	-
Acosta-Ormaechea & Morozumi (2021)		negative	
Alm & El-Ganainy (2013)	**INF**	positive	+
Limberg (2022)		positive	
Morrow, Smart & Swistak (2022)	**TOGC**	positive	+
Johnsonn & Noguera (2012)		negative	
Morrow, Smart & Swistak (2022)	**TOGC**	positive	+
Limberg (2022)	**KOF, GE, RQ, ROL, COC**	positive	+

Source: Own processing

The analysis was based on the following hypotheses:

- Developed countries of the European Union will be more likely to implement temporary reductions in the standard VAT rate during the global financial crisis and the pandemic crisis to support economic growth.
- Less developed EU countries resorted to increasing the standard VAT rate to compensate for losses in international trade and maintain the stability of their state budgets due to the global financial crisis and the pandemic.

4. Results and discussion

4.1 Analysis of rate change

The basic rate of value-added tax has been analysed from two perspectives. Changes in the basic tax rate are examined in the paper using an extended time frame. The reason is that this allows a better understanding of trends and changes in the periods before and after and increases the accuracy of the analysis. Table 3 shows the countries where the basic tax rate has changed. For the other countries studied, there were no changes in base

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

rates. There were only exceptional changes in the base rate in the 2004 reference period, while the rate remained unchanged in the other 20 countries. The most frequent change was a decrease in the base rate with the application of the new rates from 1 January 2004. The highest increase was recorded in Malta, where there was a 3% increase in the basic tax rate. The increase in VAT in Malta was reflected in a decrease in institutional indicators as the country's consumer goods and services prices increased. Conversely, in Slovakia and the Czech Republic, where there was a reduction in the basic tax rate, this may have had a positive impact on the observed quality determinants. In the context of 2004, the analysis also focused on the post-period in which there were two increases in the basic tax rate, namely, in Greece and Portugal.

Table 3. Evolution of standard tax rate

Countries	**2004**			**2008**			**2020**		
	2003	2004	2005	2007	2008	2009	2019	2020	2021
Czech Republic	22	**19 (-3)**	19	19	19	19	21	21	21
Estonia	18	18	18	18	18	**20 (+2)**	20	20	20
Great Britain	17,5	17,5	17,5	17,5	17,5	**15 (-2,5)**	20	20	NA
Greece	18	18	**19 (+1)**	19	19	19	24	24	24
Hungary	25	25	25	20	20	**25 (+5)**	27	27	27
Latvia	18	18	18	18	18	**21 (+3)**	21	21	21
Lithuania	18	18	18	18	18	**19 (+1)**	21	21	21
Malta	15	**18 (+3)**	18	18	18	18	18	18	18
Portugal	19	19	**21 (+2)**	21	**20 (-1)**	20	23	23	23
Slovak Republic	20	**19 (-1)**	19	19	19	19	20	20	20

Source: Own processing

The evolution of the standard VAT rate in crisis periods shows differences. In the 2008 period, changes in the applied standard rate were made due to the negative effects of the global financial crisis. This was particularly evident after 2008 when the basic tax rate increased. These are the countries of Hungary, Lithuania and Latvia. This decision may have had the effect of lowering the institutional indicators of the respective economies. The analysis shows that Portugal has changed its tax policy more often than other EU countries in the light of their economic development. The reduction in the applied VAT rate occurred during the global financial crisis when the UK reduced its standard VAT rate to the lowest recommended level. This was a demonstration of strong fiscal stability on the part of the UK and an attempt to mitigate the impact of the crisis. In contrast, a consistent fiscal policy was pursued during the pandemic crisis. The economies did not apply any changes to the standard VAT rate.

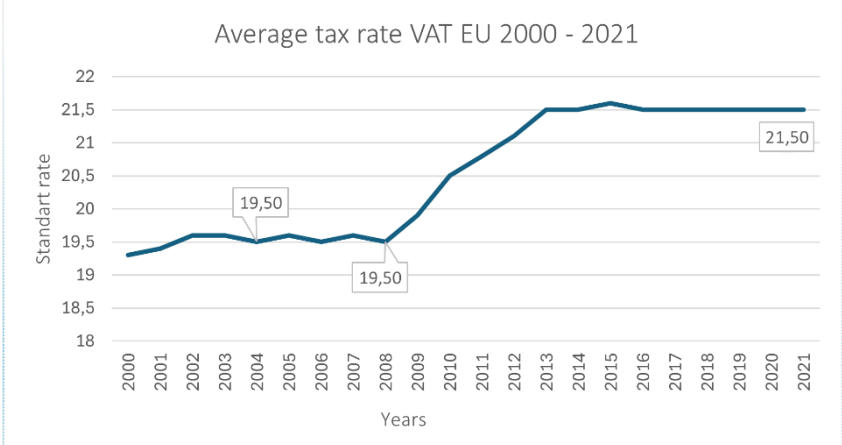


Figure 1. Evolution of the average standard rate
Source: Own processing

From the results of the rate changes in the years under review, it can be assumed that there were no significant changes. Analysing the average basic tax rate for all countries of the European Union showed the opposite.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

According to the analysis, the crisis periods of 2004, 2008, and 2020 are relatively stable in this respect (Fig. 1). However, the most significant increase in the average basic tax rate occurred only after the economic crisis of 2008-2009. According to the results, economies changed their tax policies after this economic crisis due to possible bankruptcy and its consequences. Most economies changed the value-added tax by increasing the applied tax rates. The overall average in the European Union has increased from 19.50% to 21.50%.

4.2 Correlation analysis

The results of the correlation analysis in the crisis periods of 2008 (global financial crisis) and 2020 (pandemic crisis) showed a strong positive effect among the determinants of institutional development (Fig. 2).

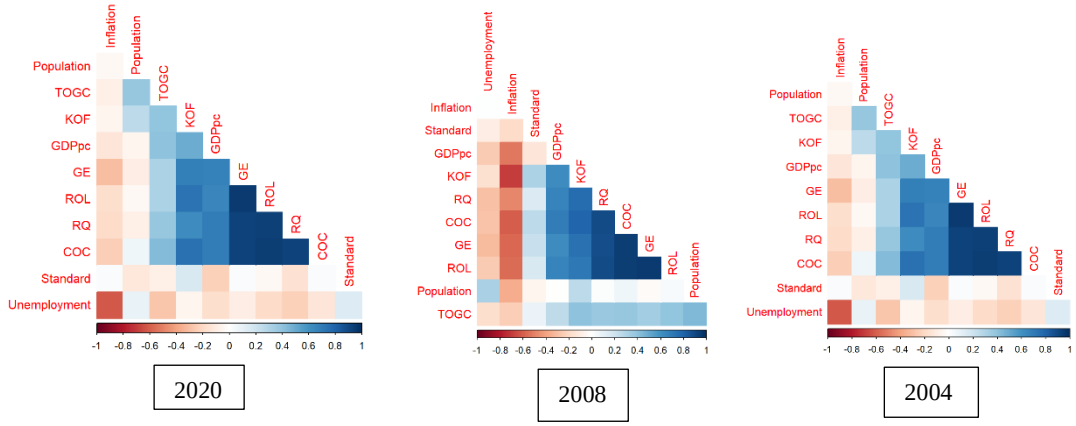


Figure 2. Correlation matrix
Source: Own processing based on results in Rstudio

Evidence of correlation between the population standard of living indicator and the globalisation index (KOF), government effectiveness (GE), legislation (ROL), and regulatory quality (RQ). A strong positive effect between institutional indicators and international trade is also confirmed in both years under study. This suggests that increasing quality and satisfaction in a state is related to increased international trade. In the crisis year 2020, there is a negative relationship between inflation (INF) and unemployment (UNE). In the next crisis year, 2008, the negative relationship between inflation and the observed institutional indicators and standard of living is negatively manifested. The zero relationship was confirmed in the crisis years mainly in relation to population, unemployment and inflation. This relationship is mainly demonstrated by the population and indicators of legislation and control of corruption. Crisis years showed comparable results to the baseline year. The predicted strong positive relationship between institutional development indicators and the standard of living (GDPpc) of the countries was observed in all the years under study. The standard tax rate did not significantly impact the other indicators observed.

4.3 Cluster analysis results

4.3.1 Global financial crisis

The first crisis period addressed in the article is the global financial crisis. The data are taken from Tab. 5. The cluster analysis results between 2004 and 2008 showed minor differences in the categorisation of European Union countries. The results are shown graphically in Fig. 3.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

The categorisation of countries between 2004 and 2008 was divided into three clusters. The clusters are analysed according to size, from the smallest to the largest. The first cluster in the base period contains Germany, France, Italy and Poland. In 2008, the first cluster included Germany, Italy, Spain, France, and the UK.

The main characteristics of the clusters are shown in Table 4. A more detailed focus is on the baseline characteristics during the global financial crisis. Generally, it is a cluster of countries whose value-added tax rate did not reach a higher level than 22% in the years under review. In this cluster, we register a higher average unemployment rate of up to 7.63%; the standard of living is at $35,685.2 per person. Compared to the countries in the second cluster, this is a decrease of only $12,349.7.

The level of inflation is the lowest of all the clusters studied. It is 4.07%. In terms of institutional development, the results show a very good condition of the government despite the global financial crisis. The globalisation indicator scores only 2.44 points lower than the most advanced economies. The impact of the crisis on these countries has been minimal. Although the lowest value of the decline in international trade reached as low as -63,391.16 their average value was estimated at $38,836.61 million.

The proof of this is that in the merged countries, according to the above statistics, there was no significant decline in international trade due to its impact. We identify a difference in the positioning of the countries of Great Britain, Spain and Poland. In the case of Poland, from a macroeconomic point of view, there has been a very significant fall in international trade of up to 11 823.83 million $. Spain, during the period of the global financial crisis, suffered a substantial decline in international trade, and the fact is that it achieved the largest decline for all EU countries at - 69 391.2 million dollars. In the area of social policy, Spain had the highest unemployment rate of any country at 11.25%.

The results of the institutional indicators showed that society is satisfied with the government and its provisions despite the deteriorating economic situation in the country. The high values in the quality indicators monitored evidence this. This shows that from an economic point of view, Spain has been significantly affected by the global financial crisis. Another country that has been categorised differently is the UK. The country shows a stable economic situation with respect to institutional indicators. This is also evident in the case of international trade, which has improved significantly over the period under review from a decline in 2004 of USD 6 962 million to an increase of USD 34 702 million.

The second cluster in the base period comprises the countries of the Netherlands, the UK, Belgium, Austria, Ireland, Luxembourg, Denmark, Finland and Sweden. The countries are clustered identically in 2008 except for the UK. The analysis showed that the countries in this cluster did not change their standard VAT rates. Countries in the years studied had high living standards, which in 2008 were a maximum of $90,970.72 per person. The results also show that these countries achieve an average standard of living of $48,034.90 per person.

During the global financial crisis, the countries reached unemployment levels of up to a maximum of 7%. This demonstrates a good economic situation and the countries' efforts to maintain jobs. Regarding international trade, the global financial crisis did not significantly affect trade relations with foreign countries. This is evidenced by the fact that its level has not fallen below USD 7,368.05 million.

Similarly, in terms of the country's institutional development, the indicators do not indicate a significant deterioration compared to the previous period. In the case of the indices monitored, they reach high values above 1.5 points. This shows that the countries in this stable grouping are achieving economic growth despite the global financial crisis (Table 4).

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

Table 4. Characteristics of Variables in Clusters 2008

			STR	GDPpc	POP	UNE	INF	TOGC	KOF	GE	RQ	ROL	COC
2004	1. cluster (9)	MIN	15	31201.93	458095	4.49	0.19	-6962	81.29	1.52	1.34	1.31	1.27
		MAX	25	64692.94	59987905	10.36	2.23	47571.61	87.42	2.28	1.78	2.41	2.41
		MEAN	20.6	37236.46	13224152	6.03	1.44	17347.52	80.54	1.95	1.65	1.73	1.92
	2. cluster (15)	MIN	15	8990.40	401268	4.33	1.16	-47237.51	67.07	-0.17	0.18	-0.18	-0.32
		MAX	25	26143.77	42921895	18.60	11.87	487.97	81.37	1.33	1.31	1.33	1.34
		MEAN	18.9	17903.93	8928690	9.61	4.30	-6502.83	74.36	0.73	0.95	1.02	0.56
	3. cluster (4)	MIN	16	13353.76	28182222	7.87	1.66	-2934.87	75.21	0.43	0.75	0.41	0.11
		MAX	22	31334.02	82516260	19.70	3.38	136147.38	84.84	1.75	1.47	1.84	1.84
		MEAN	19.4	25824.50	60275029	11.65	2.35	40287.74	80.54	1.07	1.13	1.01	0.94
2008	1. cluster (8)	MIN	15	37883.3	48865	3.65	2.48	7368.05	82.82	1.38	1.40	1.33	1.36
		MAX	25	90970.72	16445593	6.98	4.48	57150.46	89.37	2.24	1.91	1.95	2.37
		MEAN	21	48034.9	756023	5.36	3.57	20454.59	87.42	1.77	1.68	1.78	1.98
	2. cluster (14)	MIN	15	14346.9	40937	3.65	2.58	-26882.58	71.64	-0,35	0.59	-0.12	-0.27
		MAX	22	34830.27	38125759	9.51	15.40	4689.34	84.49	1.52	1.38	1.61	1.19
		MEAN	18.93	23816.4	884499	6.33	7.09	-6472.92	78.59	0.73	1.03	0.79	0.47
	3. cluster (5)	MIN	16	33263.2	4595410	5.62	2.62	-69391.16	81.11	0.27	0.97	0.44	0.26
		MAX	20	37802.39	82110097	11.25	4.07	222825.08	88.10	1.63	1.78	1.73	1.74
		MEAN	18.42	35685.2	6261552	7.634	3.28	38836.61	84.98	1.18	1.36	1.31	1.25

Source: Own processing

The last cluster is made up of countries mainly from smaller economies. In 2004, these countries were Romania, Luxembourg, Slovakia, Belgium, Croatia, Portugal, Cyprus, Malta, Slovenia, Estonia, Lithuania, Spain, Hungary and Greece. In 2008, on the other hand, the cluster was made up of Cyprus, Czech Republic, Malta, Estonia, Slovenia, Poland, Portugal, Slovakia, Greece, Hungary, Lithuania, Latvia, Belgium and Romania. The grouping of countries has not changed significantly over the years. Over the years, there have been changes in the taxation policy applied to goods and services. As in previous cases, a more detailed analysis focuses on the impact of the global financial crisis on the determinants under consideration. The average applied rate has remained at 19 %. The maximum value of the standard tax rate is reduced by 3% to 22%. For this grouping, the distribution according to the economic performance of the countries was confirmed. Over the years under review, countries have experienced increased living standards despite the pressure caused by the global financial crisis. Newly integrated economies reduced unemployment levels over the period under review. However, the economic situation in 2008 caused the most significant decline in international trade among the other clusters. Evidence of the significant decline in international trade is the average value - $6,472.92 million. Institutional indicators also point to the impact of the crisis on countries.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

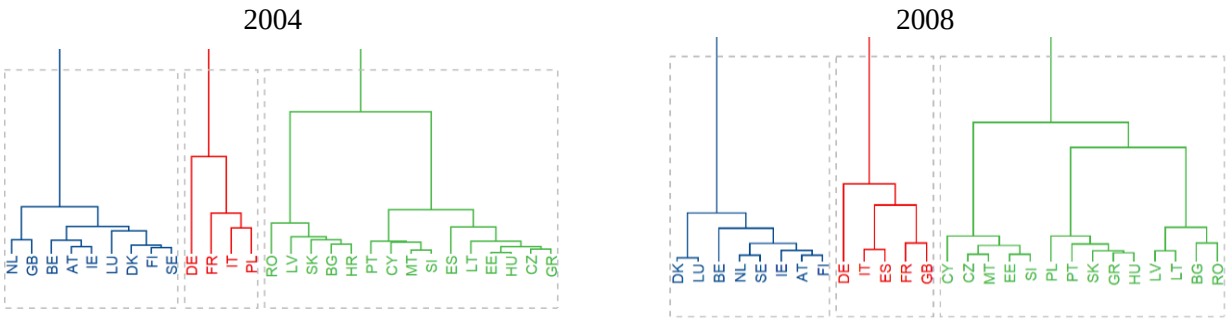


Figure 3. Cluster´s dendogram in economic crisis
Source: Own processing based on results in Rstudio

The quality of government policies and public confidence is significantly lower than other clusters in 2008. This is evidenced by the index's average level reaching a maximum of 1.03 points. This demonstrates the lower population satisfaction with government decisions. This issue may also be related to the negative perception of changes related to the value-added tax. In view of this, most countries have been undergoing tax reforms.

4.3.2 Pandemic crisis

Another crisis period that the article focuses on is the pandemic crisis. The following findings were identified based on the results of comparing clusters using cluster analysis. All the data presented in the article come from Table 6. In the case of the pandemic period, clusters are analysed based on the similarity of groupings. The analysis of the pandemic crisis period, comparing 2004 with 2020, showed different results in classifying outcomes compared to the previous period under observation. In the case of the pandemic crisis, the classification of countries is divided into three optimal clusters. The graphical representation of the clusters is provided in Figure 4. The first cluster, in the baseline period, includes the countries of the Netherlands, Finland, Sweden, Luxembourg, Denmark, Ireland, Austria, Belgium, and the United Kingdom. In the pandemic crisis period, the countries in this cluster are the Netherlands, Finland, Sweden, Luxembourg, Denmark, Ireland, Austria, Belgium, and Germany.

The research results indicate the following findings: Between 2004 and 2020, during this period, the basic VAT rate increased from a minimum of 15% to 17%. On average, the basic VAT rate rose to approximately 22%. This increase in the basic VAT rate could have been caused by the slowdown of economies following previous crises and their efforts to support economic growth. The first cluster in 2020 generally consists of economies with higher living standards compared to other economies. For example, the average living standard in this cluster is around $67,929.4 per person, with the highest value during the entire period reaching $120,010.12 per person. Despite the outbreak of the pandemic and the implementation of measures, the countries achieved very positive results in the monitored indicators. During the pandemic, there were no significant fluctuations in international trade, and the unemployment rate decreased on average to 5.85%. From the perspective of institutional indicators, countries achieved high levels of indices. For example, this is evidenced by reaching up to 90 points in the globalisation index and a corruption control determinant score of 2.23 points. This shows that countries are implementing effective anti-corruption measures, supporting the fight against corruption in public administration, and the state has a high level of public trust. There were differences in the classification of the United Kingdom. The UK achieved high economic growth and relatively high government quality in the baseline period. Due to its exit from the EU in 2020, it is impossible to compare its position during the pandemic. Another country whose classification was different was Germany. Over the years, Germany's basic VAT rate rose to 19%, the standard of living increased to $56,482 per person, and the level of international trade reached

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

$175,429.60 million. Compared to the development of other countries, Germany's economy achieved the highest values and demonstrated significant economic growth despite the pandemic.

Table 6. Characteristics of Variables in Clusters 2020

			STR	GDPpc	POP	UNE	INF	TOGC	KOF	GE	RQ	ROL	COC
2004	1. cluster (9)	MIN	15	31201.93	458095	4.49	0.19	-6962	81.29	1.52	1.34	1.31	1.27
		MAX	25	64692.94	59987905	10.36	2.23	47571.61	87.42	2.28	1.78	2.41	2.41
		MEAN	20.6	37236.46	13224152	6.03	1.44	17347.52	80.54	1.95	1.65	1.73	1.92
	2. cluster (15)	MIN	15	8990.40	401268	4.33	1.16	-47237.51	67.07	-0.17	0.18	-0.18	-0.32
		MAX	25	26143.77	42921895	18.60	11.87	487.97	81.37	1.33	1.31	1.33	1.34
		MEAN	18.9	17903.93	8928690	9.61	4.30	-6502.83	74.36	0.73	0.95	1.02	0.56
	3. cluster (4)	MIN	16	13353.76	28182222	7.87	1.66	-2934.87	75.21	0.43	0.75	0.41	0.11
		MAX	22	31334.02	82516260	19.70	3.38	136147.38	84.84	1.75	1.47	1.84	1.84
		MEAN	19.4	25824.50	60275029	11.65	2.35	40287.74	80.54	1.07	1.13	1.01	0.94
2020	1. cluster (9)	MIN	17	52305.2	63041	3.82	-0.33	7368.05	85.37	1.08	1.34	1.33	1.45
		MAX	25	120010.21	83160871	8.29	1.38	175429.64	90.48	1.90	1.85	2.02	2.23
		MEAN	21.66	67929.4	1648755	5.85	0.58	48193.13	88.09	1.60	1.63	1.68	1.87
	2. cluster (5)	MIN	19	25296	693401	2.55	1.67	-26882.58	79.04	-0.29	0.34	-0.12	-0.32
		MAX	27	42827.06	37899070	5.12	3.37	21929.17	84.85	0.91	1.23	1.02	0.61
		MEAN	22	34188.9	1690926	4.02	2.83	3277.55	81.59	0.25	0.67	0.45	0.16
	3. cluster (13)	MIN	18	28416.5	51533	4.35	-1.25	-69391.16	76.79	0.36	0.36	0.21	0.03
		MAX	25	48134.96	67571107	16.31	1.93	37965.42	86.94	1.29	1.53	1.33	1.58
		MEAN	21.23	38085.5	1651984	8.49	0.13	-1346.06	82.09	0.83	0.91	0.79	0.63

Source: Own processing

EU countries are divided differently in the other two clusters. The first group is characterised by the smallest number of merged countries. In 2004, the most developed economies of the European Union were grouped in the smallest cluster. These countries are Germany, France, Italy, and Poland. On the other hand, in 2020, the economies with a lower standard of living were grouped. These countries include Bulgaria, Romania, the Czech Republic, Hungary, and Poland. The only exception in this case is Poland, which remained in the smaller group of countries. Poland distinguished itself from the smaller EU economies through its economic stability, particularly by showing an increase in international trade at a time when the international trade of less developed EU economies was declining. The largest cluster in the baseline period was composed of Romania, Luxembourg, Slovakia, Belgium, Croatia, Portugal, Cyprus, Malta, Slovenia, Latvia, Estonia, Hungary, Czech Republic, and Greece. In 2020, the largest cluster was composed of Greece, Spain, Croatia, Lithuania, Latvia, Cyprus, Estonia, Portugal, Slovenia, Malta, Slovakia, Italy, and France. Compared to the baseline period, differences were identified in the positions of Romania, Bulgaria, Hungary, and the Czech Republic. In general, the countries in 2020 were significantly impacted by the crisis, mainly through a decline in international trade, reaching as low as -$69,391.16 million. Another assumption is that the standard of living in these observed clusters reaches only one-third of the standard of living of the countries in the first cluster in 2020.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

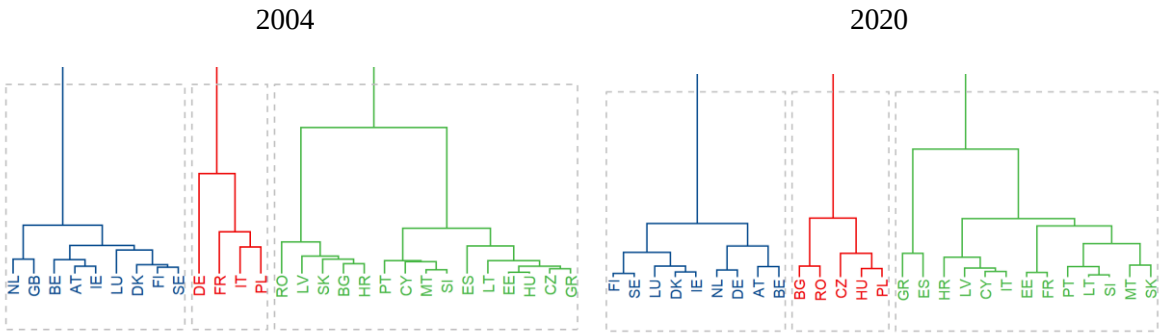


Figure 4. Cluster´s dendogram in pandemic crisis
Source: Own processing based on results in Rstudio

Institutional development indicators also confirm their influence on the division of countries. The lowest satisfaction is demonstrated by indicators of corruption control and government effectiveness, with an average score below 1 point. Based on this, we can assume that the public perceived the guidance used during the spreading pandemic very negatively, and trust in the state decreased.

4.4 Analysis results and discussion

The analysis of the results of correlation analysis, combined with the results of cluster analysis, answers the research question: "Did the economic and pandemic crises affect the change in the value-added tax rate?" The results of the analyses pointed to the significant impacts of crisis periods on the economic situation in the observed economies. The pandemic and global financial crises have significantly influenced countries' economic outcomes. Changes occurred mainly in indicators such as living standards, unemployment, and international trade. Economies more affected by the economic crisis showed significantly higher levels of unemployment than others. At the same time, these countries experienced a decline in living standards, which affected the population's purchasing power. The crises also manifested in institutional development indicators. During the observed periods, there were declines in qualitative indicators. The analysis of results also revealed a relationship between changes in the basic VAT rate and the development of institutional indicators. With the increased applied tax rate, institutional indicators responded by decreasing, confirming negative perceptions from society. The research results confirmed a positive relationship between the standard VAT rate and international trade. Another positive relationship exists between the standard VAT rate and institutional indicators. These findings confirm that increased international trade and quality improvement positively affect VAT's development. Unemployment demonstrated a negative impact in relation to the standard VAT rate. During this period, the influence of other determinants was not confirmed. The research found different results in the next period of the pandemic crisis. The only variable that partially confirmed its influence on the basic VAT rate was the globalisation index indicator. As globalisation increased between countries, the standard VAT rate was positively affected, for example, by its rise. According to the results, other determinants during the pandemic crisis did not significantly affect the development of the basic VAT rate.

Due to the differences in tax policy implementation, many countries did not significantly change the tax rates applied during the observed years. The most developed countries in the European Union were less prone to changes or only temporarily reduced VAT rates. Among the countries that aimed to stimulate the economy during the global financial crisis were the United Kingdom and Portugal. The United Kingdom sought to stimulate the economy, so in 2008, it temporarily reduced the standard VAT rate from 17.5% to 15% for 13 months. This step was part of a broader government stimulus package to support consumer demand and stabilise the economy during the financial crisis. Portugal implemented several VAT reductions for specific sectors to ensure the population's basic needs, with cuts primarily concerning food and certain services.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

In contrast, Spain did not implement a blanket VAT reduction. Still, it adopted several measures to reduce taxes for small and medium-sized enterprises and certain consumer goods to stimulate demand and support small businesses. More significant changes occurred in smaller European economies, aiming to increase their tax revenues to mitigate negative impacts. It was confirmed that these countries have lower economic stability and weaker fiscal capacity. Another group comprises countries with the lowest fiscal capacity, with more extensive reductions impossible. During the global financial crisis, these countries utilised other fiscal measures. For example, Romania provided tax relief to small businesses and reduced VAT rates for the most vulnerable population; however, in response to economic pressures, it even increased VAT to stabilise public finances. Greece similarly faced a deep debt crisis during the financial crisis, and reducing VAT was not a sustainable solution; thus, under pressure from international creditors, it decided to increase VAT to reduce its budget deficit. France responded to the global financial crisis and its pressures by implementing fiscal stimuli and job support programs.

Conversely, Italy supported businesses through tax relief and subsidies for small enterprises. Some EU countries adopted more progressive measures in response to the global financial crisis. For example, Hungary increased its standard tax rate to 25%. Despite the increased VAT, Hungary simultaneously implemented an 18% tax rate on essential consumer products, bakery items, and central heating for the most vulnerable population. These measures aimed to cover the budget shortfall in the economies (European Commission 2009, 2021). Keen and Lockwood (2010), Cnossen (2019), Bird and Gendron (2007) state regarding Hungary that during the global financial crisis, Hungary was in recession, and the increase in the standard tax rate artificially boosted demand for products (OECD 2010), (IMF 2020). Hungary's institutional indicators confirmed claims about the negative perception of changes in basic rates (Andrejovská & Helcmanovská, 2021). However, the impact of the pandemic crisis is also evident. The pandemic crisis influenced changes primarily in implementing fiscal stimuli and changes related to the reduced tax rate. For example, Spain focused on supporting tourism and hospitality. In Greece, the VAT rate was reduced for services related to transportation and dining. Portugal, Romania, and Bulgaria governments also focused on reducing VAT in the food service sector. The research did not address the nature of the fiscal stimuli provided and the reduced tax rates in other contexts. Slovakia and the Czech Republic decided not to reduce VAT rates but instead introduced the option of deferring VAT payments for companies facing significant financial difficulties. At the same time, processes for deducting VAT for businesses were simplified. Poland focused on improving the efficiency of VAT collection and strengthening tax controls while offering more flexible payment options for businesses. The analysis also indicates that the most significant changes occurred mainly after the global financial crisis from 2010 onward. Changes in this area can also be identified regarding the impacts of the pandemic crisis, but only in the post-COVID period. This fact confirms the claim that the VAT rate is influenced by the economic crisis within and outside the country. Evidence of this is that the average applied tax rate increased by 3% overall.

The impact of the global financial and pandemic crises led to the segregation and clustering of countries with similar economic situations. The results in all observed years confirmed the separation of countries with the best economic performance and sufficiently strong fiscal capacity. For this reason, these countries maintained their economic stability, and the fluctuations caused by the crises did not significantly affect them. In other clusters, some countries were more significantly impacted by economic recessions. From a research perspective, international trade was confirmed as a determinant of crises. The recorded decline and increase significantly influenced the arrangement of countries, especially during the observed crisis years. The most significant changes occurred mainly during the pandemic crisis when countries resorted primarily to closing their economies for the safety of their citizens. These measures significantly affected the demand side. Due to globalisation, there were declines in unproductive sectors, underutilisation of capacities, and supply disruptions. According to the International Monetary Fund, the crisis mainly affected cities and urban areas that generated most of the economic growth in the countries. De La Feria (2015), Hudakova et al. (2016), Seely (2013), Tait (1988), Poniatowski et al. (2020), Víghová et al. (2023) also criticise the use of uniform procedures known as "best practices," which were transferred from more developed countries to less developed ones. Critics justify this by stating that less developed economies must consider the consequences, such as increasing public debt compared to fiscally more advanced economies.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/e7945435485

We verified the established hypotheses' validity by analysing the research question and conducting a correlation analysis. The first hypothesis: "Developed countries of the European Union will be more likely to implement temporary reductions in the standard VAT rate during the global financial crisis and the pandemic crisis to support economic growth," has not been confirmed. According to the results, developed EU economies showed that reducing the standard VAT rate was not applied during the crisis. The research revealed that developed countries primarily relied on financial stimuli to maintain economic growth, such as benefits, support programs for employment retention, tax deferrals for businesses, and temporary reductions in tax rates for the tourism and restaurant sectors.

The second hypothesis: "Less developed EU countries resorted to increasing the standard VAT rate as a means to compensate for losses in international trade and to maintain the stability of their state budgets due to the global financial crisis and the pandemic crisis", was confirmed. The increase in standard VAT rates was primarily implemented by countries that joined the European Union in 2004. The goal of these countries was to compensate for the loss of state revenues, especially during the global financial crisis and a few years after it, up to 2010. The significant decline experienced in less developed economies resulted in substantial fiscal shortfalls during the years of the global financial crisis. Despite their fiscal declines, other less developed economies in the European Union implemented different forms of support for their economic growth. Following the examples of "western" countries, they primarily utilised tax deferrals, financial incentives for entrepreneurs, and similar measures. However, the actions of less developed countries in the European Union during the pandemic crisis did not confirm the hypothesis regarding increasing standard rates. These countries significantly adjusted their policies regarding reducing specific tax rates, tax relief, and financial incentives for the population. In the case of lowering specific rates, these were only temporary solutions that resulted in short-term improvements in the economic situation.

Conclusions

The crisis periods of the past two decades have confirmed that the nature of crises in European Union countries was different. While the global financial crisis primarily affected social policy through rising unemployment, the pandemic impacted international trade by implementing so-called "closed economies" during lockdowns, resulting in the most significant decline in international trade during the observed period. Using unconventional indicators of institutional development confirmed that countries with better economic situations received better ratings according to quality indices. According to this measure, the more effectively an economy tries to address a crisis situation with an impact on its population, the higher the quality of society. Changes in the standard VAT rate were confirmed only exceptionally. EU economies primarily utilised changes in specific rates, tax relief, and other financial stimuli to mitigate the impacts. In terms of legislative changes to the standard VAT rate, adjustments mainly occurred after the global financial crisis between 2008 and 2009, when many EU countries revised their fiscal policies, often raising VAT rates as part of fiscal consolidation. Our research indicated that the nature of changes in the standard VAT rate was only temporary. This was particularly evident during the pandemic crisis. However, we cannot unequivocally state that the COVID-19 pandemic brought significant economic shocks that necessitated stricter tax measures and support for affected sectors. EU countries differed in their response strategies, with some opting for temporary reductions in VAT rates to support consumption while others kept their rates unchanged. In the future, it would be interesting to expand the research to include additional determinants, both macroeconomic and focusing on the effectiveness of government measures. From the perspective of the countries analysed, based on the research results, it would be appropriate to focus on countries with the most significant changes in VAT issues during crisis years. Additionally, a more suitable focus on the years following the crisis would help capture results in the post-crisis period for a better evaluation of outcomes.

References

Abdi, H., & Williams, L.J. (2010). Principal component analysis. *Wiley Interdisciplinary Reviews: Computational Statistics*, *2*(4), 433-459. https://doi.org/10.1002/wics.101

Acosta-Ormaechea, S., & Morozumi, A. (2021). The value-added tax and growth: design matters. *International Tax and Public Finance*, *28*(5), 1211-1241. https://doi.org/10.1007/s10797-021-09681-2

Alavoutunki, K., Haapanen, M., & Pirttilä, J. (2019). The Effects of the Value-Added Tax on Revenue and Inequality. *The Journal of Development Studies*, *55*(4), 490-508. https://doi.org/10.1080/00220388.2017.1400015

Alm, J., & El-Ganainy, A. (2013). Value-added taxation and consumption. *International Tax and Public Finance*, 20, 105-128. https://doi.org/10.1007/s10797-012-9217-0

Andrejovská, A., & Helcmanovská, M. (2021). The impact of changes in the value added tax rate on the economy in the EU countries. *Montenegrin Journal of Economics*, *17*(3), 59-69. https://doi.org/10.14254/1800-5845/2021.17-3.5

Bird, R., & Gendron, P.P. (2007). The VAT in developing and transitional countries. Cambridge Books. https://doi.org/10.1017/CBO9780511619366

Castro, G. Á., & Camarillo, D. B. R. (2014). Determinants of tax revenue in OECD countries over the period 2001–2011. *Contaduría y Administración*, *59*(3), 35-59. https://doi.org/10.1016/S0186-1042(14)71265-3

Cnossen, S. (2019). *Modern VAT Principles and Challenges*. CESifo Working Paper, No. 8279

Data Finder (2024). QoG Data Finder, Available on the Internet https://datafinder.qog.gu.se/

De La Feria, R. (2019). The new VAT general reverse-charge mechanism. *EC Tax Rev*., *28*(4) 172-175. https://doi.org/10.54648/ECTA2019020

European Commision. (2009). Taxation trends in the European Union: Data for the EU Member States and Norway. Available on the Internet https://taxation-customs.ec.europa.eu/document/download/b2e2283c-03cd-4034-9ac5-914e986022ed_en?filename=2009_full_text_en.pdf

European Commission. (2021). *VAT Rates Applied in the Member States of the European Union*. Available on the Internet https://taxation-customs.ec.europa.eu/system/files/2021-06/vat_rates_en.pdf

European Commision. (2024). VAT Rules and Rates. Available on the Internet https://europa.eu/youreurope/business/taxation/vat/vat-rules-rates/index_en.htm#inline-nav-6

Hudakova, M., Vrbincik, M., Pawera, R. & Vojtech, F. (2016). Small and Medium Enterprises in the Context of the Slovak and European Integration. *In 3rd International Multidisciplinary Scientific Conference on Social Sciences and Arts SGEM*, pp. 597-604.

International Monetary Fund. (2020) Fiscal Monitor: Policies for the Recovery. Available on the Internet https://www.imf.org/en/Publications/FM/Issues/2020/10/27/Fiscal-Monitor-October-2020-Policies-for-the-Recovery-49642

Johnson, R. C., & Noguera. G. (2012). Accounting for intermediates: Production sharing and trade in value added. *Journal of International Economics*, *86*(2), 224-236. https://doi.org/10.1016/j.jinteco.2011.10.003

Keen, M. L., & Lockwood, B. (2010). The value added tax: Its causes and consequences. *Journal of Development Economics*, 138-151. https://doi.org/10.1016/j.jdeveco.2009.01.012

Kráľ, P., et al. (2009). Viacrozmerné štatistické metódy so zameraním na riešenie problémov ekonomickej praxe. Banská Bystrica: Ekonomická fakulta UMB.

Labudová, V., et al. (2021). Štatistické metódy pre ekonómov a manažérov. *Bratislava: Wolters Kluwer*.

Limberg, J. (2022). Building a tax state in the 21st century: Fiscal pressure, political regimes, and consumption taxation. *World Development*, *154*, 105879. https://doi.org/10.1016/j.worlddev.2022.105879

Morrow, P., Smart, M., & Swistak, A. (2022). VAT compliance, trade, and institutions. *Journal of Public Economics*, *208*, 104634. https://doi.org/10.1016/j.jpubeco.2022.104634

OECD (2010) OECD Economic Outlook 2009: Responding to the Crisis. https://doi.org/10.1787/eco_outlook-v2009-1-en

OECD. (2014). Fundamental principles of taxation. *Adressing the tax challenges of the digital economy*, 41-47. https://doi.org/10.1787/9789264218789-en

OECD. (2024) Indicators. Available on the Internet https://www.oecd.org/en/data/indicators.html?orderBy=mostRelevant&page=0

Omodero, C. O., & Eriabie, S. (2022). Value added taxation and industrial sector productivity: a granger causality aproach. *Cogent Business and Management*, 9-11. http://doi.org./10.1080/23311975.2022.2126120

Poniatowski, G., Śmietanka, A., & Bonch-Osmolovskiy, M. (2020). Study and reports on the VAT gap in the EU-28 member states: 2020 final report. CASE Research Paper, (503). https://doi.org/10.2139/ssrn.3744157

Seely, A. (2013). VAT: the temporary cut in the standard rate. *Standard Note SN701, House of CoCommons'Commons'ibrary*.

Tait, M.A.A. (1988). *Value added tax: International practice and problems (Vol. 24). International Monetary Fund.* ISBN 1-55775-012-2

Urbancová, H., & Hudáková, M. (2015). Employee development in small and medium enterprises in the light of demographic evolution. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis, 63*(3), 1043-1050. http://dx.doi.org/10.11118/actaun201563031043

Víghová, A., Košovská, I., & Hudáková, M. (2023). Analytical view of the profitability of commercial companies. *Entrepreneurship and Sustainability Issues, 11*(1), 353-364. https://doi.org/10.9770/jesi.2023.11.1(21)

World Bank. (2024). OPEN DATA. Retrieved January 25, 2023. Available on the Internet https://data.worldbank.org/

Funding: This paper is a part of research project of the Ministry of Education, Family and Sports of the Slovak Republic VEGA project No. 1/0638/22 Intellectual capital and regional productivity

Data Availability Statement: More information and data can be obtained from the authors on a reasonable request.

Author Contributions: The authors contributed to the paper with the following shares: Bobček (50%), Andrejovská (50%); they have read and agreed to the published version of the manuscript.

Zuzana BOBČEK, Ing. PhD at the student Department of Banking and Investments, Technical university of Košice, Fakulty of Economics, Slovakia. Research interests: Accounting, Taxation.
ORCID ID: https://orcid.org/0009-0001-7507-6099

Alena ANDREJOVSKÁ, Ing. PhD., Associate Professor, Head of the Finance department, Technical university of Košice, Fakulty of Economics, Slovakia. Research interests: Accounting, Taxation and Business Economics.
ORCID: https://orcid.org/0000-0001-5954-3008

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

Publisher
http://jssidoi.org/esc/home

CAPITAL AND INTERNATIONAL GROWTH: LESSONS FROM IT COMPANIES FOR SHAPING ENTREPRENEURSHIP IN THE AGE OF INDUSTRY 4.0

Alexander Reinhold Werbik

University of Applied Sciences and Arts Lucerne, Switzerland

Received 28 August 2024; accepted the 2nd November 2024; published 30 December 2024

Abstract. This study examines how investors influence the international expansion of IT startups. The research is based on quantitative primary data collected through a comprehensive survey of leading IT startups. The findings reveal that capital providers play a dual role in facilitating entry into foreign markets. Their direct involvement includes proactive support in the internationalisation process, while indirectly, they help overcome barriers such as cultural challenges and market entry risks. Through quantitative analysis, the study highlights dynamics that continue to be essential for understanding investor strategies in today's rapidly evolving business environment. These insights are particularly relevant in the AI-driven era, where data-intensive business models and strong network effects make rapid global scaling a critical success factor. The analysis provides a unique perspective on enduring patterns that are increasingly relevant in the current context, offering valuable lessons for navigating contemporary challenges in international expansion.

Keywords: capital; IT; startups; investor strategies; AI; business models

Reference to this paper should be made as follows: Werbik, A. R. 2024. Capital and international growth: lessons from IT companies for shaping entrepreneurship in the age of industry 4.0. *Entrepreneurship and Sustainability Issues*, 12(2), 429-442. http://doi.org/10.9770/f2379425762

JEL Classifications: L26

1. Introduction

The internationalisation of the IT industry has emerged as a significant phenomenon in the global business landscape. As digital technologies continue to reshape the "DNA" of industries and transform economies, software companies have been at the forefront of leveraging these opportunities to expand their presence beyond domestic markets (Martinelli et al., 2021). In the Age of AI in production and Industry 4.0, this growing trend of internationalisation holds implications not only for IT companies themselves but also for manufacturing firms seeking to remain competitive on a global market scale (Kagermann et al., 2016).

The role of investors, such as banks, venture capital firms, business angels, and private investors is a critical determinant in understanding the internationalisation process of software companies (Anwar et al., 2023). Certain types of investors, particularly venture capital, extend beyond merely providing financial resources; they also play a vital role in shaping the future performance of their portfolio companies (Rossi & Martini, 2019). Investors act as "scouts" that extend the network of entrepreneurs (Granz et al., 2021) and facilitate access to foreign markets via their network connections (Picot et al., 2015).

They can fulfil a “coach function” by providing strategic guidance and mentorship to their portfolio companies (Colombo & Grilli, 2009). They help entrepreneurs overcome growth and innovation challenges through mentorship and extensive networks with key partners, potential advisors, and customers (Ahlstrom & Bruton, 2006; Greenwood et al., 2022). In this respect, experienced and specialised investors that offer "smart money"

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

support alongside financial investments also facilitate the international ambitions of their portfolio companies (Sørensen, 2007; Isabelle et al., 2019; Bosio et al., 2021).

Understanding the relationship between IT companies and their investors in better detail is critical to developing robust internationalisation strategies for diverse industries in today's Industry 4.0 era. Manufacturing firms, particularly those embracing AI-technologies and data-driven business models, can greatly benefit from understanding the experiences of the IT industry (Björkdahl, 2020). The integration of data-driven technologies and software solutions into their operations, enhances their capabilities but also exposes them to strong networking effects (Obermaier & Mosch, 2019). These networking effects, which are driven by the interconnectivity and data-driven nature of the IT industry (Buxmann et al., 2015), have significant implications for the internationalisation and financing strategies of data-driven manufacturing firms (Winter, 2019).

By examining the pathways into global markets within the software industry in more detail, manufacturing firms can gain insights and guidance to effectively navigate the complexities of international markets (Kagermann & Wahlster 2013; Werbik et al., 2024).

The need for internationalisation in the Age of Industry 4.0

In the age of Industry 4.0, internationalisation has become essential for companies embedded in the data economy. Expanding into global markets opens access to new opportunities and resources while also presenting challenges, such as managing "psychic distance" – the differences in language, culture, legal systems, and economic conditions across countries (Stöttinger & Schlegelmilch, 1998; Vătămănescu et al., 2020; Puthusserry, 2021). Addressing these challenges effectively requires building and leveraging networks that bridge cultural divides, close information gaps, and help manage risks related to suppliers, partners, and customers (Santos et al., 2012; Vahlne, 2020; Morrish & Earl, 2021).

In this context, entrepreneurial decisions about international expansion are shaped as much by personal connections as by formal market analysis. Cuypers et al. (2020) provide insights that international strategies are driven not only by data but also by the social fabric of existing networks. Such networks guide companies in selecting markets and defining entry strategies. Their social connections provide crucial insights into export potential and reduce uncertainties in unfamiliar environments (Thrassou et al., 2020). These relationships thus play an essential role in influencing the direction of international growth as a "socially embedded endeavour" (Masiello & Izzo, 2019).

Beyond market access, one significant advantage of entering international markets is that it drives innovation and strengthens competitive positioning. By exposing companies to diverse consumer preferences, business practices, and regulatory landscapes, global expansion catalyses product and process adaptation (Knight & Cavusgil, 2024; Singh et al., 2024). Competing on a global scale encourages firms to refine their operations, achieving efficiencies, cost advantages and competitive advantages (Koudal & Coleman, 2005; Pinto Soto, 2018; Petrillo et al., 2021).

Operating in foreign markets also equips companies with advanced knowledge and skills essential for navigating the digital age. Engaging internationally enables firms to adopt cutting-edge technologies, business models, and management practices, thus building capabilities that support value chain growth (Zahra et al., 2000; Leão & da Silva, 2021). These experiences attract global talent, adding diverse perspectives that are strategic assets in sustaining long-term growth (Yudha et al., 2020).

For companies in the data economy, which often operates under a "winner-takes-all" paradigm, scaling up through internationalisation is paramount. Success in data-driven fields, particularly in AI, hinges on access to large, diverse datasets to refine algorithms, enhance products, and provide highly personalised services (Haucap, 2020). Expanding globally allows companies to tap into these rich data sources, amplifying their technological advantage and continuously improving AI capabilities (dos Santos & Williamson, 2024). This strengthens market dominance by enabling more efficient and accurate solutions and creates a feedback loop that further

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

consolidates competitive standing. In these high-stakes markets, international expansion is not merely an option but a core strategy to secure long-term relevance and outpace global competitors.

Moreover, internationalisation fosters robust cross-border networks that connect firms to invaluable resources, including capital, technology, and market intelligence (Johanson & Vahlne, 2009). These networks facilitate partnerships that fuel both innovation and growth (Insch & Steensma, 2006). For IT and data-driven companies, especially, maintaining strong networks is essential in keeping pace with rapid technological advancements (Bhatti et al, 2020). Investors play a key role here, using their connections to support international expansion, extending the company's reach and capabilities (Kromidha & Robson, 2021).

Thus, networks bridge international markets (Sharma & Johanson, 1987), offering crucial insights that help companies expand globally (Vasilchenko & Morrish, 2011). In regional contexts, strong social capital greatly supports knowledge-sharing networks, where investors play an enabling role by using their connections to ease market entry (Valdaliso et al., 2011; Monaghan et al., 2020).

Role of financiers

In their study on Silicon Valley, Ferrari and Granovetter (2009) emphasise the important role of venture capital firms in cluster environments, where local stakeholders engage in strong connections and interact with a wide range of further participants in the region. These investments play a crucial role in fostering a dynamic network of diverse actors, facilitating collaboration and knowledge sharing among them (ibid, 2009).

In analysing the internationalisation of business angel investments, Croce et al. (2023) examine cross-border deals and investments in culturally distant markets. Their findings suggest that investment and entrepreneurial experience contribute to the internationalisation of portfolio companies. Accordingly, venture capitalists embed firms in a local entrepreneurial ecosystem (Granz et al., 2017).

In entrepreneurial ecosystems, investors play a key role in creating "entrepreneurial spawning grounds"- dynamic environments that foster the growth of new spin-off companies. (Gompers et al., 2005). Companies embedded in ecosystem alliances can strengthen their organisational legitimacy and benefit from gains in reputation (Svensson et al., 2019).

Companies in venture capital investors' portfolios benefit from direct and indirect access to valuable networks, expertise, and value-added services (Proksch et al., 2017). They can achieve better performance through a wider network incorporating intra- and extra-industry connections to potential suppliers, customers, and managers (Sørensen, 2007; Bellavitis et al., 2014).

In addition, venture capital investors actively invest in human resources by facilitating access to qualified team members and influencing corporate governance (Gulshani, 2023). Therefore, they play a key role in assembling the management team, influencing employee recruitment, monitoring activities, and getting involved in strategic decisions. Via their experienced business perspective, they create value beyond their financial investments (Gompers & Lerner, 2001; Weber, 2009; Gutterman, 2024). Bock et al. (2018) show that superior company performance can be attributed to the coaching support of venture capitalists. For resource-constrained small businesses in particular, this form of smart-money investment can serve as a catalyst by accessing external resources (Fernhaber & McDougall-Covin, 2009; Bumbac & Ştefaniuc, 2021).

In the evolving landscape of Industry 4.0 and AI in manufacturing, the role of financiers extends beyond the traditional purpose of funding and into the strategic facilitation of internationalisation (Woo, 2020). Recent authors underscore the significance of financiers in enabling companies to harness the potential of AI technologies, positioning these firms for successful global expansion (Lutz & George, 2012; Lerner & Nanda, 2020; Davenport & Mittal, 2023). Venture Capital financiers not only provide the capital necessary for technological adoption but also offer invaluable guidance and knowledge spillovers on leveraging these technologies to create competitive advantages in foreign markets (Florida & Kenney, 1988; Agmon & Messica,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

2008; Akcigit et al., 2024). By acting as catalysts for technological integration, financiers help portfolio companies navigate the complexities of international markets more effectively (Fernhaber et al., 2009).

Moreover, the increasing interconnectivity of global markets demands that companies engage in more sophisticated strategies to manage cross-border operations. Financiers play a pivotal role in this regard by facilitating access to international networks that offer insights into market trends, regulatory landscapes, and potential partnership opportunities (Bradley et al., 2019). Companies can better adapt to the rapid changes in international markets through strategic alliances and collaborations, enhancing their agility and responsiveness (Vahlne & Johanson, 2021). This network access, provided by financiers, is particularly crucial for companies operating within the fast-paced sectors of Industry 4.0, where staying ahead of technological and market developments is critical to sustaining growth and competitive advantage (Niemczyk & Trzaska, 2020).

Additionally, the support of financiers in the internationalisation process increasingly involves a focus on sustainability and corporate social responsibility (Liang & Renneboog, 2020). As global stakeholders demand more environmentally and socially responsible business practices, financiers leverage their influence to encourage portfolio companies to adopt sustainable practices (Crifoet al., 2019). This shift aligns with global sustainability goals and opens new international market opportunities for companies that prioritise green technologies and CSR initiatives. In this way, the role of venture capital is critical in shaping the future direction of their portfolio companies, guiding them towards various growth paths that are aligned with global standards and expectations.

2. Research

As the literature review suggests, the multifaceted role of investors in facilitating international expansion goes beyond mere financial contributions, extending into the area of strategic guidance and providing market insights. This multidimensional support is particularly crucial in the high-tech and IT driven sectors, where the pace of change and the complexity of global markets demand nuanced understanding and rapid adaptability (Buxmann et al., 2015). Investors with a deep understanding of specific market nuances and technological trends can provide portfolio companies with a more competitive edge, enabling them to navigate international markets more effectively. This strategic alignment between investors' expertise and companies' internationalisation efforts underscores the importance of selecting investors who not only provide capital but also align with the company's vision and strategic direction (Picot, 2015).

The concept of "smart money" further elaborates on the idea that not all capital is equal. The qualitative aspects of capital, particularly in terms of added value that investors bring to their portfolio companies, are critical. This added value encompasses network access, industry insights, mentoring, and strategic advisement, which are indispensable for companies aiming to internationalise (Sørensen, 2007). Investors become co-pilots (Siegel et al., 1988) in the journey of international expansion, actively involved in steering the company towards strategic partnerships, identifying market opportunities, and avoiding potential pitfalls (Lutz & George, 2012). This collaborative approach between investors and companies underscores a symbiotic relationship where both parties work towards a common goal of successful internationalisation.

In context, it is assumed that companies receiving “scouting support” from investors (Colombo & Grilli, 2009) should be better able to allocate resources towards activities such as market research, new product development, overseas operations, and targeted marketing campaigns in foreign markets (Gurbuz, 2018). Given the potential positive impact of smart money engagements on “resource pooling” (Ferrary, 2010) as well as on firms` survival rates, revenue, and risk sensitivity (Huang & Madhavan, 2021), it is to assume that investors can have a favourable influence on the internationalisation of companies.

Referring to Ferrary and Granovetter (2009), Picot et al. (2015) and Bock et al. (2018), this assumption is grounded in the belief that financial support from investors has the capacity to help companies overcome broader resource challenges. Companies are expected to experience facilitation in their international expansion efforts by receiving additional know-how and coaching support.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

Based on these assumptions, it is suggested that investors play a crucial role in supporting the internationalisation of companies. Hypothesis 1, therefore, proposes that when investors express a specific interest in internationalising, software companies should also exhibit a higher degree of internationalisation. This implies that investors actively encourage and facilitate the international expansion of the companies they support.

H1: IT companies expand internationally to a greater extent when they have the backing of investors who are specifically focused on global growth.

Furthermore, it is assumed that venture capitalists reduce major barriers to internationalisation. Due to their networks and industry insights, they provide strategic insights, industry-specific knowledge and access to potential partners and further stakeholders (Woo, 2020; Nörthemann, 2023). Aggarwal (2019) shows that access to network resources via strategic alliances is a vital determinant for innovation within a firm, as networks provide essential information and expertise (see also Yaqub et al., 2020; Fan et al., 2023). In combination with findings that investors facilitate the access of "social capital" (Alexy et al., 2012), they are expected to play a vital role in helping companies overcome not only financial barriers but also cultural barriers as well as contact deficits and therefore reduce asymmetric information (Brinster & Tykvova, 2021). Hypothesis 2 builds upon the notion that investors can effectively reduce barriers to international expansion through their assistance in forming strategic alliances, their market know-how, and their support in establishing business relationships (Balachandran, 2024).

H2: Investors play a significant role in reducing the barriers that companies face in their international expansion efforts.

3. Data set and methodology

The data from 440 individual IT companies were collected as part of an empirical survey (Werbik, 2015; Picot et al., 2015). In this study, the analysed data were collected as part of the DESC research project at LMU Munich, initiated in 2011 and concluded with the publication by Picot et al. in 2015. The survey targeted managers of software and embedded systems companies, who were invited via email to participate as key informants. It achieved an 11% response rate, with a retention rate of 21%. Data sets with over 25% missing values and responses where participants completed less than 80% of the questionnaire were excluded, focusing exclusively on software companies. The final dataset of 440 IT companies was part of a dissertation project (Werbik, 2015) and has since been foundational in prior analyses. Its continued relevance is demonstrated through its application to contemporary AI and Industry 4.0 research, offering insights into internationalisation trends that influence technological advancements in these areas. The same methodological analysis was applied to ensure consistency and comparability with previous findings. This data reuse is explicitly stated to maintain transparency and provide a coherent analytical framework for current and future studies.

Despite being collected several years ago, these data provide valuable insights into fundamental dynamics of internationalisation that remain relevant in today's business environment. In the context of the rapidly evolving AI-driven economy, revisiting and analysing these constructs allows us to draw lessons crucial for addressing contemporary scaling and market entry challenges. The following constructs were considered for analysis:
Capital providers (Y1): The exogenous construct was measured using a 5-point Likert scale ("Our key capital providers are interested in the internationalisation of the company: Does not apply at all ... Applies completely").
Growth barriers (Y2): The endogenous construct was measured through four different indicators on a 5-point Likert scale. These include:
• Risk GB1 ("One obstacle to internationalisation is the high level of risk associated with expanding into new markets: Does not apply at all ... Applies completely")
• Cultural barriers GB2 ("One obstacle to internationalisation is the presence of language and cultural barriers: Does not apply at all ... Applies completely")
• Investment costs GB3("One obstacle to internationalization is the substantial investment require: Does not apply at all ... Applies completely")

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

• Contact deficiencies GB4 ("One obstacle to internationalisation is that the management lacks the necessary contacts abroad: Does not apply at all ... Applies completely").
Degree of internationalisation (Y3): The endogenous construct was measured using the ratio of foreign sales to total sales of the company as an indicator.
In addition, the three control variables “Company age”, “Company size”, and “Perceived market attractiveness” were included in the analysis:
• Company age (X1) was measured using the year of establishment of the company.
• Company size (X2) was determined by the number of employees in the last completed fiscal year.
• Market attractiveness (X3): The perceived market attractiveness was measured using a 5-point Likert scale ("We are inclined against further internationalisation because the German market is profitable enough to not require internationalisation: Does not apply at all ... Applies completely").
The data was analysed using the “smartPLS" program. The results were visualised in the form of a structural equation model.

4. Results

The constructs in the study show a strong correlation among their items, as indicated by the factor and indicator reliability analysis. The factor loadings for the items representing “Risk” (0.810), “Cultural barriers” (0.794), “Investment costs” (0.794), and “Lack of contacts” (0.751) demonstrate their contribution to their respective constructs. Furthermore, the measure of scale homogeneity, Cronbach's Alpha, exhibits a value of 0.8386, surpassing the accepted threshold of 0.7 (Hair et al., 2011). The results confirm the reliability and consistency of the components, as demonstrated in Table 1.

Table 1. Factor and indicator reliability of the constructs

	GB 1	GB 2	GB 3	GB 4
Factor loadings	0,810	0,794	0,794	0,751
Cronbach's Alpha	0,8386			

Moving on to the analysis of the direct and indirect influence of capital providers on the degree of internationalisation, the significance of these relationships was evaluated through 5000 bootstrap samples and a case-wise exclusion approach. Figure 1 visually depicts the interconnections between the constructs.

The exogenous construct "capital providers" accounts for 17.3% of the growth obstacles faced by companies. With a negative β value of -0.416 and being significant at a level of 0.001 (t=5.239), the results in Figure 1 suggests that capital providers, who demonstrate a stronger interest in internationalisation, significantly reduce the barriers to expanding internationally. This results in an acceptance of hypothesis 1.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

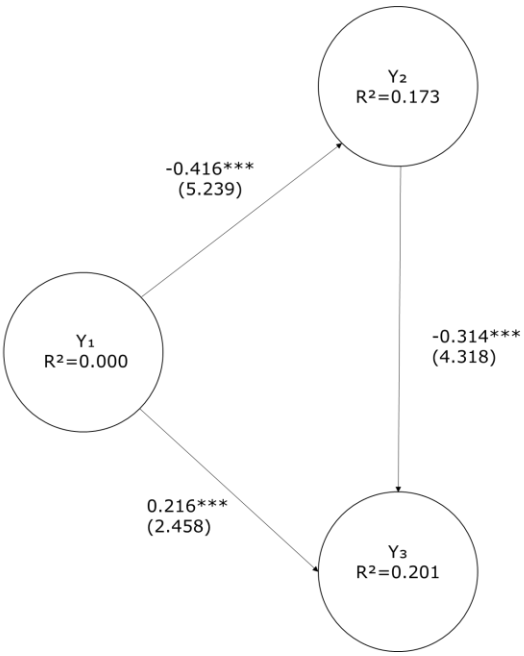


Figure 1. Relationships of constructs

Moreover, capital providers have a direct influence on the internationalisation of companies. The β value is positively significant (β = 0.216; t = 2.458) at a level of 0.001. This means that the higher the interest of capital providers in the internationalisation of companies, the higher the degree of internationalisation observed. Interestingly, the influence of capital providers also indirectly affects the degree of internationalisation. The results show a significant negative relationship (β = -0.314; t = 4.138) between internationalisation barriers and the degree of internationalisation of software companies. The constructs "capital providers" and "internationalisation barriers" together account for 20.1% of the variance in the variable "degree of internationalisation".

In the next step, the three control variables were included in the further analysis, namely “Company Age” (X1), “Company Size” (X2), and “Perceived Market Attractiveness” (X3). As illustrated in Figure 2, the incorporation of these variables significantly improves the model's overall explanatory capacity by an additional 6% when compared to the previous version.

In total, the two constructs, "Capital Providers" and "Internationalization Barriers" account for 26.2% of the variance of the construct "Degree of Internationalisation". The impact of capital providers on the internationalisation level of the software companies remains strongly positive (β=0.222; t=2.378), indicating their significant role in facilitating international expansion. Additionally, capital providers have a notable negative effect on the construct of "Internationalization Barriers" (β=-0.418; t=5.221), indicating their influence in reducing the obstacles associated with internationalisation. The relationship between "Internationalization Barriers" and the "Degree of Internationalisation" continues to be significantly negative (β=-0.1600; t=2.020). Hypothesis 2 could be accepted.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

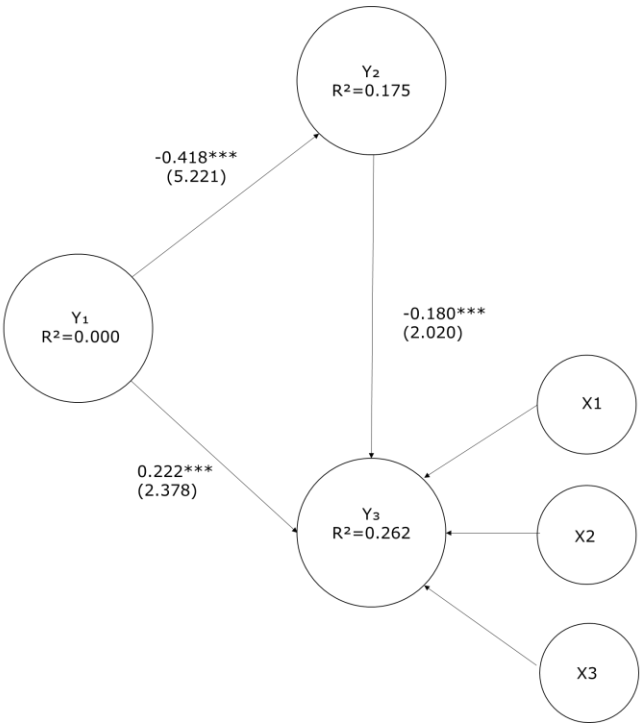


Figure 2. Relationships of constructs, including control variables

Consistent with the results, capital providers who show a genuine interest in the internationalisation of companies exert a dual influence, both directly and indirectly, on the expansion into foreign markets: Their direct influence is evident in their proactive support, where they contribute resources, expertise, and guidance to ensure a seamless entry into new markets and facilitate expansion. Additionally, they indirectly contribute to internationalisation by actively addressing and minimising barriers that companies face in their international ventures.

5. Discussion & Interpretation

The findings of this study emphasise the multifaceted role of investors in supporting the internationalisation efforts of IT companies. Beyond providing capital, investors offer strategic insights, access to industry-specific knowledge, and expansive networks, all of which help companies overcome significant barriers to international expansion (Ferrary & Granovetter, 2009; Bellavitis et al., 2014; Cuypers et al., 2020). This dual role, both financial and strategic, aligns with previous studies showing that investors directly influence a company's international ambitions and indirectly reduce the obstacles they encounter, such as cultural, informational, and regulatory challenges (Granz et al., 2021).

These insights carry practical relevance for manufacturing firms in Industry 4.0 and AI sectors. The rapid advancement of interconnected, data-driven models has intensified the need for international growth, particularly in environments where network effects amplify the benefits of global scaling (Santos et al., 2012; Kagermann et al., 2016; Björkdahl, 2020) By observing the strategies that IT companies employ with investor support, manufacturers can adapt these approaches to enhance their internationalisation efforts. Investor networks offer IT firms access to foreign markets, new capabilities, and competitive positioning - essential advantages for AI and data-intensive business models (Obermaier & Mosch, 2019).

The results suggest that investors with global experience not only provide "smart money" but also act as connectors, bridging cultural, regulatory, and informational gaps that arise during internationalisation (Sørensen, 2007; Woo, 2020; Bradley et al., 2019). This role is particularly valuable in sectors where companies

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

are embedded within complex global supply chains and require diverse data sources to fuel AI models and support data-driven decision-making (Winter, 2019; dos Santos & Williamson, 2024). The data indicate that investors with deep industry insights and international connections can help firms navigate complexities, accelerating entry into new markets and enhancing operational resilience.

The alignment of investor ambitions with company goals emerges as a key factor in internationalisation success. For IT firms, selecting investors with a strong interest in global growth can create synergies that support market expansion and the technological evolution needed for competitiveness in AI-driven industries (Lutz & George, 2012; Crifo et al., 2019). This alignment reduces the challenges associated with global expansion, including psychic distance and cultural barriers, while helping firms adapt products and services to meet international demands (Stöttinger & Schlegelmilch, 1998; Mason & Stark, 2004; Cuypers et al., 2020).

The indirect effects of investor involvement, as demonstrated by this study, further highlight the role of investors as strategic partners who actively reduce internationalisation barriers. For companies operating in Industry 4.0, investor support in logistical and regulatory challenges offers a path to mitigating the risks and costs often accompanying international market entry (Calvelli & Cannavale, 2018; Aggarwal, 2019). Such support shortens time-to-market and enhances competitiveness in interconnected global markets, a critical advantage in AI and data-driven manufacturing (Yudha et al., 2022; Greenwood et al., 2022).

In conclusion, these findings reinforce that investor support functions not only as a financial resource but as a strategic asset crucial for companies in data-intensive sectors such as Industry 4.0 and AI. Aligning with globally experienced investors allows firms in these sectors to capitalise on networks, strategic guidance, and cross-border insights to overcome the complexities of internationalisation. This study's alignment with current literature highlights the investors' dual role, providing essential financial backing while leveraging networks crucial for success in globally integrated Industry 4.0 environments.

6. Learnings for Entrepreneurship in the Age of Industry 4.0

This study explored the dynamics of investor involvement in the internationalisation of companies, revealing the multifaceted roles that investors play beyond providing financial support. The findings illuminate how VC investors facilitate global market entry and expansion for their portfolio companies through a focused examination of industry-specific expertise, strategic guidance, network access, and the motivational drives of venture capital investors. These insights offer valuable guidance for entrepreneurship within the Industry 4.0 landscape, where strategic partnerships with investors can make a decisive impact on global growth trajectories. These insights are relevant to smart manufacturing startups and established companies in the Industry 4.0 era. By understanding the value of venture capital investors' industry knowledge, strategic guidance, networks, and motivations, smart manufacturing companies can gain key lessons to support their global market entry and expansion strategies in modern entrepreneurship.

Adapting to Global Market Dynamics through Strategic Investor Selection

The empirical findings highlight the importance of selecting investors who contribute more than financial support alone. For smart manufacturing startups and entrepreneurial ventures with advanced technological platforms and highly interconnected systems - fields that are strongly impacted by network effects (Kagermann et al., 2016) - investors who bring industry insights, strategic mentorship, and broad networks are invaluable. These contributions are instrumental in navigating the complex, international landscape of Industry 4.0. For these entrepreneurial firms, this underscores the need to strategically select investors who align with their global growth vision and provide the resources and expertise required to achieve international success.

Utilising Investor Networks for Market Penetration

The study’s insights reinforce the strategic advantage of leveraging investor networks to support international market entry and expansion. Smart manufacturing and AI-driven startups can tap into their investors' networks to access critical market insights, potential partners, customers, and regulatory guidance. Aligning with

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/f2379425762

investors with strong connections in target markets can significantly reduce "psychic distance" (Stöttinger & Schlegelmilch, 1998) and cultural barriers, smoothing the path to global expansion.

Emphasising the Role of 'Smart Money'

The concept of "smart money," where investors add value beyond capital through strategic guidance, industry expertise, and networks, emerges as a pivotal factor for startups and companies pursuing internationalisation. One crucial success factor for future entrepreneurs is to engage with investors who actively support their international growth journey as strategic partners - not just financiers. Choosing investors with a successful track record in global expansion, especially those experienced in integrating advanced technologies across borders, is particularly beneficial. The "smart money" advantage is essential for smart manufacturing startups operating in highly specialised and complex technological environments.

Investor Involvement

Investor engagement is during critical growth phases, such as international expansion, scaling operations, or overcoming market entry barriers. Their involvement extends beyond mere financial support, as investors actively leverage their expertise, networks, and strategic insights to drive the company's success. Their participation is typically motivated by significant profit opportunities and the potential to mitigate risks, underscoring their dual role as both financial backers and strategic partners. Aligning investor involvement with the growth stages of startups ensures that their contributions have the greatest impact on the company's performance and competitive positioning in the market.

Strategic Alignment with Investors' Global Aspirations

The findings also suggest that aligning with investors who share similar global ambitions can enhance a company's ability to address challenges in international markets. For entrepreneurs, this means seeking out investors whose aspirations for global expansion match their own. Such alignment facilitates a smoother internationalisation process and ensures that both the company and its investors are working toward maximising global market opportunities together.

Leveraging Technological Synergies for International Growth

The evolving dynamics of global markets, with a strong focus on digitalisation and AI integration, suggest that investors with technological expertise are especially valuable. Smart manufacturing companies and startups at the forefront of Industry 4.0 should prioritise investors who understand the complexities of technological advancements and can guide them in leveraging these innovations for international growth. This includes navigating regulatory complexities around data, employing AI-driven market analysis, and utilising digital platforms to extend global reach.

In conclusion, entrepreneurs in the Age of AI and Industry 4.0 can draw significant learnings from the empirical results, particularly in terms of investor involvement in the internationalisation process. By strategically selecting and aligning with the right investors, leveraging their networks, and capitalising on the 'smart money' advantages, these companies can enhance their competitiveness and achieve successful global expansion in the dynamic landscape of AI and Industry 4.0.

7. Research Limitations

While historical data offer a robust foundation for understanding long-term trends, they may not fully capture recent shifts driven by advancements in AI, machine learning, and the increasing importance of data-driven decision-making. One limitation of this study is the age of the primary data, collected nearly a decade ago. This presents an opportunity for future research to replicate the study with Industry 4.0 companies. Such replication would not only enable a comparative analysis of how internationalisation strategies have evolved over time but also yield more profound insights into the distinct challenges and opportunities that companies encounter in the

age of digital transformation. Additionally, while the focus on software companies provides rich insights into this specific sector, it limits the generalizability of the findings across other industries. Broadening the scope to include a broader range of Industry 4.0 enterprises could offer a more holistic understanding of internationalisation practices across various technological landscapes.

References

Aggarwal, V. A. (2019). Resource congestion in alliance networks: How a firm's partners' partners influence the benefits of collaboration. *Strategic Management Journal*, 41(4), 627-655. https://doi.org/10.1002/smj.3109

Agmon, T., & Messica, A. (2008). Venture capital funds, financial foreign direct investment and the generation of local comparative advantage in the technology sector in Israel. *Contributions to Political Economy*, 27(1), 57-72. https://doi.org/10.1093/cpe/bzn001

Ahlstrom, D., & Bruton, G. D. (2006). Venture capital in emerging economies: Networks and institutional change. *Entrepreneurship Theory and Practice*, 30(2), 299-320. https://doi.org/10.1111/j.1540-6520.2006.00122.x

Akcigit, U., Ates, S. T., Lerner, J., Townsend, R. R., & Zhestkova, Y. (2024). Fencing off Silicon Valley: Cross-border venture capital and technology spillovers. *Journal of Monetary Economics*, 141, 14-39. https://doi.org/10.1016/j.jmoneco.2023.10.016

Alexy, O. T., Block, J. H., Sandner, P., & Ter Wal, A. L. (2012). Social capital of venture capitalists and startup funding. *Small Business Economics*, 39, 835-851. https://doi.org/10.1007/s11187-011-9337-4

Anwar, M., Li, S., Al-Omush, A., & Al-Nimer, M. (2023). SMEs' internationalisation: Mapping the field through finance, ITC, and social ties. *Sustainability*, 15(4), 3162. https://doi.org/10.3390/su15043162

Balachandran, S. (2024). The inside track: Entrepreneurs' corporate experience and startups' access to incumbent partners' resources. *Strategic Management Journal*, 45(6), 1117-1150. https://doi.org/10.1002/smj.3576

Bellavitis, C., Filatotchev, I., & Kamuriwo, D. S. (2014). The effects of intra-industry and extra-industry networks on performance: A case of venture capital portfolio firms. *Managerial and Decision Economics*, 35(2), 129-144. https://doi.org/10.1002/mde.2647

Bhatti, W. A., Chwialkowska, A., & Glowik, M. (2020). The Role of Power and Network Positioning in Technology Firms' International Expansion. In Academy of Management Proceedings, 2020(1), 13328. https://doi.org/10.5465/AMBPP.2020.13328abstract

Björkdahl, J. (2020). Strategies for digitalisation in manufacturing firms. *California Management Review*, 62(4), 17-36. https://doi.org/10.1177/0008125620920349

Bock, C., Huber, A., & Jarchow, S. (2018). Growth factors of research-based spin-offs and the role of venture capital investing. *The Journal of Technology Transfer*, 43(5), 1375-1409. https://doi.org/10.1007/s10961-017-9635-3

Bosio, A. O., Gervasoni, A., & Bollazzi, F. (2021). The strategic role of private equity in the internationalisation of Italian SMEs. *Journal of Financial Management, Markets and Institutions*, 9(02), 2150007. https://doi.org/10.1142/S2282717X21500079

Bradley, W. A., Duruflé, G., Hellmann, T. F., & Wilson, K. E. (2019). Cross-border venture capital investments: What is the role of public policy? *Journal of Risk and Financial Management*, 12(3), 112. https://doi.org/10.3390/jrfm12030112

Brinster, L., & Tykvova, T. (2021). Connected VCs and strategic alliances: Evidence from biotech companies. *Journal of Corporate Finance*, 66, 101835. https://doi.org/10.1016/j.jcorpfin.2020.101835

Bumbac, D., & Ştefaniuc, O. (2021). Venture capital financing: Particularities and opportunities. *International Journal of Innovative Technologies in Economy*, 34(2), 1-6. https://doi.org/10.31435/rsglobal_ijite/30062021/7544

Buxmann, P., Diefenbach, H., & Hess, T. (2015). Die Softwareindustrie: Ökonomische Prinzipien, Strategien, Perspektiven. Springer-Verlag. https://doi.org/10.1007/978-3-662-45589-0

Calvelli, A., & Cannavale, C. (2018). Internationalising firms: International strategy, trends, and challenges. Springer. https://doi.org/10.1007/978-3-319-91551-7

Colombo, M. G., & Grilli, L. (2009). A capital partnership: How human and venture capital affect the growth of high-tech startups. *Strategic Change*, 18(7-8), 231-239. https://doi.org/10.1002/jsc.850

Crifo, P., Durand, R., & Gond, J. P. (2019). Encouraging investors to enable corporate sustainability transitions: The case of responsible investment in France. *Organization & Environment*, 32(2), 125-144. https://doi.org/10.1177/1086026619848145

Croce, A., Schwienbacher, A., & Ughetto, E. (2023). Internationalisation of business angel investments: The role of investor experience. *International Business Review*, 32(1), 102033. https://doi.org/10.1016/j.ibusrev.2022.102033

Cuypers, I. R., Ertug, G., Cantwell, J., Zaheer, A., & Kilduff, M. (2020). Making connections: Social networks in international business. *Journal of International Business Studies*, 51, 714-736. https://doi.org/10.1057/s41267-020-00319-9

Davenport, T. H., & Mittal, N. (2023). All-in on AI: How smart companies win big with artificial intelligence. Harvard Business Press.

Dos Santos, J. F., & Williamson, P. J. (2024). Beyond connectivity: Artificial intelligence and the internationalisation of digital firms. *Information and Organization*, 34(4), 100538. https://doi.org/10.1016/j.infoandorg.2024.100538

Fan, Y., Ly, K. C., & Jiang, Y. (2023). Institutional investor networks and firm innovation: Evidence from China. *International Review of Financial Analysis*, 89, 102751. https://doi.org/10.1016/j.irfa.2023.102751

Ferrary, M. (2010). Syndication of venture capital investment: The art of resource pooling. *Entrepreneurship Theory and Practice*, 34(5), 885-908. https://doi.org/10.1111/j.1540-6520.2009.00356.x

Ferrary, M., & Granovetter, M. (2009). The role of venture capital firms in Silicon Valley's complex innovation network. *Economy and Society*, 38(2), 326-359. https://doi.org/10.1080/03085140902786827

Fernhaber, S. A., Mcdougall-Covin, P. P., & Shepherd, D. A. (2009). International entrepreneurship: Leveraging internal and external knowledge sources. *Strategic Entrepreneurship Journal*, 3(4), 297-320. https://doi.org/10.1002/sej.76

Florida, R. L., & Kenney, M. (1988). Venture capital-financed innovation and technological change in the USA. *Research Policy*, 17(3), 119-137. https://doi.org/10.1016/0048-7333(88)90038-8

Gompers, P., Kovner, A., Lerner, J., & Scharfstein, D. (2005). Venture capital investment cycles: The role of experience and specialisation. *Journal of Financial Economics*, 81(1), 649-679. https://doi.org/10.3386/w11385

Gompers, P., & Lerner, J. (2001). The venture capital revolution. *Journal of Economic Perspectives*, 15(2), 145-168. https://doi.org/10.1257/jep.15.2.145

Granz, C., Lutz, E., & Henn, M. (2021). Scout or coach? Value-added services as selection criteria in entrepreneurs' venture capitalist selection. *Venture Capital*, 23(1), 5-40. https://doi.org/10.1080/13691066.2020.1824603

Granz, J., Lehmann, E. E., & Woywode, M. (2017). The effects of family ownership on innovation: Empirical evidence from the German machine tool industry. *The Journal of Technology Transfer*, 43(1), 30-57.

Greenwood, J., Han, P., & Sánchez, J. M. (2022). Venture capital: A catalyst for innovation and growth. Available at SSRN 4077464. https://doi.org/10.20955/r.104.120-30

Gulshani, R. (2023). HRM in Venture Funded Entrepreneurial Firms: A Stage-wise Functional Elaboration Approach. Academy of Management Proceedings, 2023(1), 16855. https://doi.org/10.5465/AMPROC.2023.16855abstract

Gurbuz, E. (2018). Theory of new product development and its applications. *Marketing*, 57-75. https://doi.org/10.5772/intechopen.74527

Gutterman, A. S. (2024). Launching and Managing an Impact Investment Venture Capital Fund: A Guide for Fund Managers and Sustainable Entrepreneurs. https://doi.org/10.2139/ssrn.4944235

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2011). Multivariate data analysis (7th ed.). Prentice Hall.

Haucap, J. (2019). Competition and competition policy in a data-driven economy. *Intereconomics*, 54, 201-208. https://doi.org/10.1007/s10272-019-0825-0

Huang, P., & Madhavan, R. (2021). Dumb money or smart money? Meta-analytically unpacking corporate venture capital. *Strategic Entrepreneurship Journal*, 15(3), 403-429. https://doi.org/10.1002/sej.1369

Insch, G. S., & Steensma, H. K. (2006). The relationship between firm strategic profile and alliance partners' characteristics. *Journal of Managerial Issues*, 321-339.

Isabelle, D. A., Westerlund, M., Rajala, R., & Leminen, S. (2019). Understanding the aspirations of Finnish entrepreneurs and venture capitalists: Their effects on international operations and growth. *International Journal of Entrepreneurship and Small Business*, 37(2), 190-213. https://doi.org/10.1504/IJESB.2019.100106

Johanson, J., & Vahlne, J. E. (2009). The Uppsala internationalisation process model revisited: From liability of foreignness to liability of outsidership. *Journal of International Business Studies*, 40, 1411-1431. https://doi.org/10.1057/jibs.2009.24

Kagermann, H., Anderl, R., Gausemeier, J., Schuh, G., & Wahlster, W. (2016). Industrie 4.0 in a global context: Strategies for cooperating with international partners. Herbert Utz Verlag.

Kagermann, H., Wahlster, W., & Helbig, J. (2013). Securing the Future of German Manufacturing Industry: Recommendations for Implementing the Strategic Initiative Industrie 4.0. Forschungsunion and National Academy of Science and Engineering.

Knight, G., & Cavusgil, S. T. (2024). A path forward for research on born global firms. In Key Developments in International Marketing: Influential Contributions and Future Avenues for Research (pp. 55-72). Cham: Springer International Publishing. https://doi.org/10.1007/978-3-031-17366-0_3

Koudal, P., & Coleman, G. (2005). Building a global presence: Strategic imperatives for manufacturers. *Harvard Business Review*, 83(3), 82-91.

Kromidha, E., & Robson, P. J. (2021). The role of digital presence and investment network signals on the internationalisation of small firms. *International Small Business Journal*, 39(2), 109-129. https://doi.org/10.1177/0266242620958898

Leão, P., & da Silva, M. M. (2021). Impacts of digital transformation on firms' competitive advantages: A systematic literature review. Strategic Change, 30(5), 421-441. https://doi.org/10.1002/jsc.2459

Lerner, J., & Nanda, R. (2020). Venture capital's role in financing innovation: What we know and how much we still need to learn. *Journal of Economic Perspectives*, 34(3), 237-261. https://doi.org/10.1257/jep.34.3.237

Liang, H., & Renneboog, L. (2020). Corporate social responsibility and sustainable finance: A review of the literature. European Corporate Governance Institute - Finance Working Paper, (701). https://doi.org/10.2139/ssrn.3698631

Lutz, E., & George, G. (2012). Venture capitalists' role in new venture internationalisation. *The Journal of Private Equity*, 26-41. https://doi.org/10.3905/jpe.2012.16.1.026

Martinelli, E. M., Farioli, M. C., & Tunisini, A. (2021). New companies' DNA: The heritage of the past industrial revolutions in digital transformation. *Journal of Management and Governance*, 25, 1079-1106. https://doi.org/10.1007/s10997-020-09539-5

Mason, C., & Stark, M. (2004). What do investors look for in a business plan? A comparison of the investment criteria of bankers, venture capitalists, and business angels. *International Small Business Journal*, 22(3), 227-248. https://doi.org/10.1177/0266242604042377

Masiello, B., & Izzo, F. (2019). Entrepreneurial ecosystems and the growth of SMEs in Italy. *Entrepreneurship & Regional Development*, 31(7-8), 497-515.

Monaghan, S., Tippmann, E., & Coviello, N. (2020). Born digitals: Thoughts on their internationalisation and a research agenda. *Journal of International Business Studies*, 51, 11-22. https://doi.org/10.1057/s41267-019-00290-0

Morrish, S. C., & Earl, A. (2021). Networks, institutional environment and firm internationalisation. *Journal of Business & Industrial Marketing*, 36(11), 2037-2048. https://doi.org/10.1108/JBIM-05-2019-0230

Niemczyk, J., & Trzaska, R. (2020). Network approach in Industry 4.0: Perspective of coopetition. In Contemporary Challenges in Cooperation and Coopetition in the Age of Industry 4.0 (pp. 139-154). Springer International Publishing. https://doi.org/10.1007/978-3-030-30549-9_7

Nörthemann, A. (2023). Industry-specific specialisation in venture capitalists' internationalisation decisions. *Journal of Business Economics*, 93(5), 891-927. https://doi.org/10.1007/s11573-022-01129-1

Obermaier, R., & Mosch, P. (2019). Digitale Plattformen - Klassifizierung, ökonomische Wirkungslogik und Anwendungsfälle in einer Industrie 4.0. In Handbuch Industrie 4.0 und Digitale Transformation (pp. 379-417). Springer. https://doi.org/10.1007/978-3-658-24576-4_17

Petrillo, A., De Felice, F., Lambert-Torres, G., & Bonaldi, E. (Eds.). (2021). Operations Management: Emerging Trend in the Digital Era. https://doi.org/10.5772/intechopen.87847

Picot, A., Hess, T., Hörndlein, C., Kaltenecker, N., Jablonka, C., Schreiner, M., Werbik, A., Benlian, A., & Neuburger, R. (2015). The internationalisation of German software-based companies. Springer. https://doi.org/10.1007/978-3-319-13548-9

Pinto Soto, G. (2018). Global strategies for SMEs in Latin America. *International Journal of Emerging Markets*, 13(2), 323-344.

Proksch, D., Stranz, W., Röhr, N., Ernst, C., Pinkwart, A., & Schefczyk, M. (2017). Value-adding activities of venture capital companies: A content analysis of investors' original documents in Germany. *Venture Capital*, 19(3), 129-146. https://doi.org/10.1080/13691066.2016.1242573

Puthusserry, P., Khan, Z., Nair, S. R., & King, T. (2021). Mitigating psychic distance and enhancing internationalisation of fintech SMEs from emerging markets: The role of board of directors. *British Journal of Management*, 32(4), 1097-1120. https://doi.org/10.1111/1467-8551.12502

Rossi, M., & Martini, E. (2019). Venture capitalists and value creation: The role of informal investors in the growth of smaller European firms. *International Journal of Globalisation and Small Business*, 10(3), 233-247. https://doi.org/10.1504/IJGSB.2019.100123

Santos, J. C., Ferreira, M. P., & Reis, N. M. R. D. (2012). Industrial network membership: Reducing psychic distance hazards in internationalisation of firms. *Revista Brasileira de Gestão de Negócios*, 14, 438-452. https://doi.org/10.7819/rbgn.v14i45.1082

Sharma, D., & Johanson, J. (1987). Technical consultancy in internationalisation. *International Marketing Review*, 4(4), 20-29. https://doi.org/10.1108/eb008339

Siegel, R., Siegel, E., & MacMillan, I. C. (1988). Corporate venture capitalists: Autonomy, obstacles, and performance. *Journal of Business Venturing*, 3(3), 233-247. https://doi.org/10.1016/0883-9026(88)90017-1

Singh, B., & Kaunert, C. (2024). AI-driven strategies for customer engagement, market segmentation, and resource optimisation: Projecting end user satisfaction and futuristic growth of business. In AI Innovations in Service and Tourism Marketing (pp. 104-128). IGI Global. https://doi.org/10.4018/979-8-3693-7909-7.ch006

Sørensen, M. (2007). How smart is smart money? A two-sided matching model of venture capital. *The Journal of Finance*, 62(6), 2725-2762. https://doi.org/10.1111/j.1540-6261.2007.01291.x

Stöttinger, B., & Schlegelmilch, B. B. (1998). Explaining export development through psychic distance: Enlightening or elusive? *International Marketing Review*, 15(5), 357-372. https://doi.org/10.1108/02651339810236353

Svensson, C., Udesen, J., & Webb, J. (2019). Alliances in financial ecosystems: A source of organisational legitimacy for fintech startups and incumbents. *Technology Innovation Management Review*, 9(1). https://doi.org/10.22215/timreview/1209

Thrassou, A., Vrontis, D., Crescimanno, M., Giacomarra, M., & Galati, A. (2020). The requisite match between internal resources and network ties to cope with knowledge scarcity. *Journal of Knowledge Management*, 24(4), 861-880. https://doi.org/10.1108/JKM-06-2019-0291

Valdaliso, J., Elola, A., Aranguren, M., & Lopez, S. (2011). Social capital, internationalisation and absorptive capacity: The electronics and ICT cluster of the Basque Country. *Entrepreneurship & Regional Development*, 23(9-10), 707-733. https://doi.org/10.1080/08985626.2010.505268

Vahlne, J. E. (2020). Development of the Uppsala model of internationalisation process: From internationalisation to evolution. *Global Strategy Journal*, 10(2), 239-250. https://doi.org/10.1002/gsj.1375

Vahlne, J. E., & Johanson, J. (2021). Coping with complexity by making trust an important dimension in governance and coordination. *International Business Review*, 30(2), 101798. https://doi.org/10.1016/j.ibusrev.2021.101798

Vasilchenko, E., & Morrish, S. (2011). The role of entrepreneurial networks in the exploration and exploitation of internationalisation opportunities by information and communication technology firms. *Journal of International Marketing*, 19(4), 88-105. https://doi.org/10.1509/jim.10.0134

Vătămănescu, E. M., Alexandru, V. A., Mitan, A., & Dabija, D. C. (2020). From the deliberate managerial strategy towards international business performance: A psychic distance vs. global mindset approach. *Systems Research and Behavioral Science*, 37(2), 374-387. https://doi.org/10.1002/sres.2658

Weber, C. (2009). Corporate venture capitalists with a 'bird's-eye view'-a dynamic social network perspective. *Schmalenbach Business Review*, 61, 195-224. https://doi.org/10.1007/BF03396784

Werbik, A. (2015). Die Bedeutung des Standortes im Zeitalter der Digitalisierung am Beispiel von Softwareunternehmen. Lulu.com.

Werbik, A., Nussbaum, J., & Winter, J. (2024). Coming home in the age of Industry 4.0? The effects of offshoring and backshoring on manufacturing companies' success. *Sci*, 6(4), 58. https://doi.org/10.3390/sci6040058

Winter, J. (2019). Wertschöpfung 4.0 - Auf dem Weg in eine kollaborative Wirtschaft. Marktchancen, 40-62.

Woo, H. (2020). Foreign venture capital firms and internationalisation of ventures. Multinational Business Review, 28(3), 381-399. https://doi.org/10.1108/MBR-09-2019-0104

Yaqub, M., et al. (2020). Networks and knowledge exchange in international business. *Journal of International Business Studies*, 51(3), 455-477.

Yudha, P. S., Udin, U., Widowati, R., & Wahyuningsih, R. S. H. (2022). Talent management research trends in international market-based organisations: A bibliometric analysis from 2018 to 2021. Ec*onomics and Business Quarterly Reviews*, 5(4). https://doi.org/10.31014/aior.1992.05.04.471

Alexander Reinhold WERBIK
ORDID ID: https://orcid.org/0009-0001-3172-4138

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

Publisher
http://jssidoi.org/esc/home

USING ARTIFICIAL INTELLIGENCE (AI) FOR LOCAL TERRITORIAL DEVELOPMENT: DATA-BASED MACHINE DIAGNOSTICS OF LATVIAN MUNICIPALITIES*

Vera Komarova [1*], Janis Kudins [2], Aija Sannikova [3], Edmunds Čižo [4], Oksana Ruza [5], Anita Kokarevica [6], Zane Zeibote [7]

[1,2,4,5] Daugavpils University, Vienibas street 13, Daugavpils, Latvia
[3] EKA University of Applied Sciences, Pernavas street 62, Riga, Latvia
[6] Riga Stradinsh University, Dzirciema street 16, Riga, Latvia
[7] University of Latvia, Raina blvd. 19, Riga, Latvia

E-mails: [1]vera.komarova@du.lv (Corresponding author); [2]janis.kudins@du.lv; [3]aija.sannikova@inbox.lv; [4]edmunds.cizo@du.lv; [5]oksana.ruza@du.lv; [6]anita.kokarevica@rsu.lv; [7]zzeibote1@gmail.com*

Received 11 September 2024; accepted 9 December 2024; published 30 December 2024

Abstract. The study investigates the application of artificial intelligence (AI), specifically the ChatGPT 4o tool, for data-based machine diagnostics of the local territorial development using Latvian municipalities as a case study. The topic is highly relevant due to the growing demand for precise, data-driven territorial diagnostics to address sustainable development and governance challenges. The study aims to evaluate AI tools' efficiency and contextual adaptability in performing municipalities' SWOT (Strengths, Weaknesses, Opportunities, Threats) analyses based on their annual public reports. Using discourse analysis as the methodological framework, the study focuses on five municipalities representing different typological clusters in Latvia: Riga City Municipality, Yelgava City Municipality, Liepaja City Municipality, Ropazhi County Municipality, and Augshdaugava County Municipality. Empirical results demonstrate the AI tool's ability to conduct detailed SWOT analyses, uncovering nuanced insights such as demographic challenges, economic dependencies, and opportunities for green transition initiatives. Notably, the tool highlighted innovative perspectives, such as the competitive impact of proximity to Riga on surrounding municipalities. The study identifies the AI tool's capabilities, including flexibility in focus, contextual socioeconomic and environmental factors integration, and efficiency in processing complex datasets. However, challenges such as data limitations and the necessity of human oversight were also noted. The findings contribute novel insights into the feasibility and potential of AI for local territorial diagnostics, paving the way for broader applications in regional development planning and policymaking.

Keywords: machine diagnostics; AI tool (ChatGPT 4o); discourse analysis; SWOT analysis; cluster analysis; territorial analytic data (TAD); annual public report; local territorial development; Latvian municipalities

Reference to this paper should be made as follows: Komarova, V., Kudins, J., Sannikova, A., Čižo, E., Ruza, O., Kokarevica, A., Zeibote, Z. 2024. Using artificial intelligence (AI) for local territorial development: data-based machine diagnostics of Latvian municipalities. *Entrepreneurship and Sustainability Issues*, 12(2), 443-459. http://doi.org/10.9770/y3784695648

JEL Classifications: R11, R58, O33, Q01

Additional disciplines: data science, computer science

1. Introduction

Data-based machine diagnostics of the local territorial development is a new approach to the monitoring, planning and other processes of managing the development of territories (Simonova & Sykora, 2011a, 2011b;

* *This research was funded by Daugavpils University, Latvia.*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

Arnould et al., 2020; Nadtochiy et al., 2022; Sen et al., 2023). This new approach is vital to the success of policy development and the delivery of programmes, projects and operational services (Cervera, 2021), as well as to control the balance between economic development, social development, and environmental development (Grybaite & Tvaronavičiene, 2008). The absence of data-based general-scale diagnoses is one of the main reasons why policies, lines of action, and strategies do not adequately respond to the dynamics and needs of territories (Aslaeva, 2020; Suárez-Roldán et al., 2024). In Latvia, the poor state of data-based machine diagnostics of the local territorial development is especially relevant for remote municipalities (Abele et al., 2023; Grytten et al., 2024; Komarova et al., 2024).

The research problem concerning data-based diagnostics of the local territorial development is centred on the complexity and multifaceted nature of spatial development issues, encompassing economic, social, environmental, and technological dimensions. For example, Chehabeddine and Tvaronavičienė highlighted the difficulty of creating a comprehensive data-based diagnostic model that incorporates such wide-ranging and evolving factors as indicators and measurement limitations, interconnected security and development issues, impact of technological threats (Chehabeddine & Tvaronavičienė, 2020). Can AI tools help with data-based diagnostics of the local territorial development? Some studies (Laurini, 2023; Yigitcanlar et al., 2024; Xue et al., 2024; Hu et al., 2024) state that AI tools can significantly enhance local, territorial development data-based diagnostics. For example, AI tools can process large datasets to identify patterns and trends in regional development, such as population growth, resource usage, or economic disparities (Laurini, 2023). Machine learning algorithms can forecast future developments, like economic growth or environmental impacts, based on historical data; AI tools can also adapt to local contexts by considering unique regional characteristics, ensuring diagnostics are relevant to specific territories (Xue et al., 2024; Hu et al., 2024). Moreover, AI systems can simulate various development scenarios, helping policymakers understand the potential outcomes of different strategies; decision-support tools can prioritise initiatives based on predicted effectiveness and alignment with sustainable development goals (Yigitcanlar et al., 2024). By integrating AI tools, local territorial development diagnostics can become more precise, efficient, and adaptable to changing needs, ultimately fostering sustainable and inclusive growth.

The purpose of this study is to analyse the capabilities of AI tool (ChatGPT 4o) for data-based machine diagnostics of the local territorial development using the case of Latvian municipalities (N = 43) and based on their annual public reports (2023). This diagnostic includes a SWOT analysis to be carried out to understand the strengths, weaknesses, opportunities and threats associated with each specific municipality in the broader context of their sustainable development (including social, economic and environmental aspects), that is, in the context of typological clusters of Latvian municipalities (within the methodological approach of discourse analysis). The authors proposed the following research hypothesis: AI tool (ChatGPT 4o) is capable and very efficient data-based machine diagnostics of the local, territorial development, and contextual data is a necessary input for such diagnostics. Five Latvian municipalities (one from each typological cluster) are selected for the empirical study: Riga City Municipality (the capital of Latvia, also chosen for the experiment), Yelgava City Municipality (the capital-centred city of Latvia), Liepaya City Municipality (the remote town of Latvia), Ropazhi County Municipality (the capital-centred county of Latvia), Augshdaugava County Municipality (the remote county of Latvia).

The next section will provide a review of scientific studies that contribute to the topic of data-based machine diagnostics of local territorial development, and then the authors will provide the conceptual framework of my own study and research methodology. The research results and discussion section will present the empirical results of data-based machine diagnostics of the development of five selected Latvian municipalities. The final section will provide conclusions, study limitations and recommendations for further research.

2. Literature review

This section overviews the key findings of studies relevant to the analysed issue, contributing to a deeper understanding of the state-of-art and perspectives for data-based machine diagnostics of local territorial development.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

The study "A new era for data analysis in qualitative research: ChatGPT" (Sen et al., 2023) contributes to the topic of data-based machine diagnostics of the local territorial development by exploring the potential of AI tools, specifically ChatGPT-4, in qualitative data analysis. It demonstrates how AI can enhance data organisation, coding, and interpretation, essential for understanding complex phenomena like territorial development (Sen et al., 2023). According to the authors, key contributions include: (1) by automating tasks such as creating codes, categories, and themes, ChatGPT can streamline qualitative analysis, allowing researchers to focus on interpreting and applying insights to local territorial development strategies; (2) the proved ability of ChatGPT to identify relationships and provide explanations for generated codes and themes can help uncover underlying patterns and trends in territorial data; (3) the showed AI tool's adaptability to different languages ensures it can be used in diverse local contexts, which is crucial for territorial development studies that often involve region-specific data; (4) ChatGPT offers a faster alternative to traditional qualitative analysis software, making it accessible to researchers without extensive training in qualitative data analysis tools. By integrating such capabilities, this study paves the way for leveraging AI tools to support data-driven decision-making in territorial development, addressing both qualitative and quantitative aspects of machine diagnostics in this field (Sen et al., 2023).

Over time, AI tools have become integral to urban and regional planning, moving from simple mapping and information systems to advanced applications like machine learning, rule-based systems, and knowledge management (Laurini, 2023). According to Laurini, AI helps structure and utilise data, enabling decision-making through tools like ontologies, knowledge networks, and rule-based systems; this method solves new problems by adapting solutions from similar past cases, aiding diagnostic processes and planning decisions; AI models predict trends, optimise resource allocation, and automate processes, such as land-use planning and traffic management (Laurini, 2023). However, there are also real-world challenges, mainly sociological barriers (fear of over-reliance on technology) and technological hurdles (insufficient data representation frameworks). Laurini (2023) emphasises the importance of: (1) holistic data integration to synthesise diverse datasets; (2) dynamic real-time monitoring through IoT-enabled systems; (3) scenario simulations to evaluate developmental impacts; (4) personalised diagnostics tailored to regional characteristics. Hence, the author underscores the transformative potential of AI in fostering inclusive and adaptive governance and addressing interconnected economic, social, and environmental challenges in local territorial diagnostics (Laurini, 2023).

Integrating geographic data (GeoAI) and IoT is highlighted as a powerful approach for monitoring and modelling local development trends (Yigitcanlar et al., 2024). Relevant ideas of the study "Artificial intelligence and the local government: A five-decade scientometric analysis on the evolution, state-of-the-art, and emerging trends" include (Yigitcanlar et al., 2024)): (1) AI's ability to predict economic and social trends, optimising resource allocation; (2) customising AI systems for regional contexts to ensure effective diagnostics; (3) using real-time data for responsive and accurate decision-making; (4) identifying sustainable practices to align development with environmental goals. Bertacchini and Bouchet (2016) highlighted the integration of Territorial Intelligence (TI) and Artificial Intelligence (AI) as complementary approaches to understanding and addressing local territorial development. Key findings and ideas relevant to data-based machine diagnostics are (Bertacchini & Bouchet, 2016): (1) TI mobilises resources and fosters collective action, emphasising systemic approaches; (2) "info-obesity" challenges decision-making, and AI mitigates this by processing large datasets; (3) AI-enhanced tools improve visualisation and stakeholder engagement. Relevant ideas for diagnostics include systemic data integration, scenario forecasting, and citizen-centric approaches. Combining TI and AI ensures sustainable, collaborative, and efficient diagnostics, addressing complex regional challenges (Bertacchini & Bouchet, 2016).

Chao and Tao (2023) examined regional integration and AI development in the Yangtze and Pearl River Deltas, offering these relevant insights: (1) holistic resource integration to complement regional advantages; (2) predictive analytics for growth trends and sustainable planning; (3) real-time monitoring to optimise resource allocation and operational efficiency (Chao & Tao, 2023). The study underscores AI's role in overcoming integration challenges and achieving balanced and sustainable development. In turn, the study "Applications of machine learning in national territory spatial planning" (Xue et al., 2024) highlights machine learning's role in enhancing territorial diagnostics, in particular, big-data-driven monitoring of urban and rural dynamics using remote sensing and IoT, dynamic simulations for urban growth and land-use changes, methodological

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

innovations like spatial modelling and clustering for diagnostics. According to Xue and his colleagues, challenges include the lack of multi-source, high-resolution data. Future directions stress improving small-scale studies, multi-source data mining, and integrating ML in rural innovation (Xue et al., 2024). Overall, the above study emphasises the transformative role of machine learning in making data-based diagnostics more precise, multi-dimensional, and actionable, directly benefiting local territorial development.

The reviewed studies collectively illustrate AI and machine learning's transformative potential in the local territorial diagnostics. By integrating big data, GeoAI, and adaptive governance frameworks, AI tools can enhance monitoring, predictive modelling, and resource optimisation. Challenges like data gaps and societal resistance require continued innovation and stakeholder engagement to realise AI's full potential for sustainable territorial development. A remaining gap that the authors hope to fill with further research is the lack of empirical and experimental case studies that demonstrate the real (not just theoretical) feasibility and usefulness of AI tools for data-based diagnostics of the local territorial development.

3. Conceptual framework and research methodology

According to the authors, the issue of data-based machine diagnostics of the local territorial development is interdisciplinary in nature. The "frame of reference" of this study refers mainly to the sciences of regional economics, computer science and data science and is based on three key terms / terminological constructions: (1) machine diagnostics of the local territorial development (this terminological construction refers to computer science & regional economics); (2) data, in particular, territorial analytic data, TAD (Simonova & Sykora, 2011a, 2011b) (the term refers to data science). Table 1 attempts to systemically present the "frame of reference" and key terms / terminological constructions of the study, including their conceptual understanding within the study, empirical interpretation and referent science.

Table 1. The "frame of references" and key terms / terminological constructions of the study

Terms / terminological constructions	Conceptual understanding within the study	Empirical interpretation within the study	Referent science
Territorial analytic data, TAD	Input data that are periodically gathered and updated to support territorial management processes (diagnostics, planning, decision-making, etc.), helping ensure that these processes consider the current state of natural, cultural, and socioeconomic factors	Annual public reports of Latvian municipalities	Data Science
Machine diagnostics of the local territorial development	A new method for spatial planning that merges machine learning, big data, and spatial analysis to facilitate targeted, sustainable, and data-informed territorial planning, which positioned as a transformative tool for addressing complex spatial planning challenges, offering both technical advancements and practical frameworks for improving local territorial development	SWOT analysis conducted by AI tool using standard techniques of extracting and summarising key points from the analysed document. The task for AI tool (ChatGPT 4o): Based on the attached Public Report 2023 (in Latvian), conduct a SWOT analysis to understand the strengths, weaknesses, opportunities and threats for the municipality.	Computer science & Regional economics

Source: own elaborated based on Simonova & Sykora, 2011a, 2011b; Sen et al., 2023; Xue et al., 2024

Regarding territorial analytic data (TAD) (Table 1), the authors use the conceptual understanding and empirical interpretation of the term proposed by Simonova and Sykora (2011a, 2011b). They define TAD as a crucial tool in territorial planning, describing it as an essential input for creating the "Principles of territorial development" (Simonova & Sykora, 2011a, 2011b). TAD includes data that are periodically gathered and updated to support decision-making processes for regional planning, helping ensure that planning considers the current state of natural, cultural, and socioeconomic factors. The creation and management of TAD are important steps in regional development to achieve sustainable, balanced growth while coordinating public and private interests (Simonova & Sykora, 2011a, 2011b). Simonova and Sykora do not create the term "territorial analytic data" (TAD) themselves. Instead, they refer to it within the context of established territorial planning practices and legal frameworks. They cite regional legislation and strategic documents (for example, European Spatial Development Perspective**,** Law No. 183/2006 Sb. of the Czech Republic) that use and define TAD as a standard

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

tool or "default tool" for territorial planning. Specifically, TAD is described as an input for the broader "Principles of territorial development", aligning with legislative norms and requirements for regional planning (Simonova & Sykora, 2011a, 2011b).

In turn, machine diagnostics of the local territorial development is conceptually understood as a new method for spatial planning that merges machine learning, big data, and spatial analysis to facilitate targeted, sustainable, and data-informed territorial planning (Sen et al., 2023). Artificial intelligence and data processing advances are set to refine diagnostics, enabling more accurate, localised, and actionable territorial insights. While machine learning provides significant advancements, challenges remain in data mining, small-scale spatial studies, and multi-source data integration. Overall, Xue et al. position machine learning as a transformative tool for addressing complex spatial planning challenges, offering both technical advancements and practical frameworks for improving local territorial development (Xue et al., 2024).

Within this study, machine diagnostics of the local territorial development is empirically interpreted as SWOT analysis conducted by AI tool using standard techniques of extracting and summarising key points from the documents – annual public reports of Latvian municipalities (Table 1). The output of this analysis will be SWOT matrixes of territories (European Commission, 2024). According to the definition of the European Commission, SWOT analysis is a strategic tool for use in context analysis. The acronym refers to the domains it considers: Strengths, Weaknesses, Opportunities and Threats. It combines an assessment of the strengths and weaknesses of an organisation, geographical area or sector to evaluate the opportunities and threats the environment poses. SWOT analysis considers internal and external factors to maximise the potential of strengths and opportunities while minimising the impact of weaknesses and threats (European Commission, 2024).

Three interrelated structuring questions (Figure 1) emerged from the conceptual understanding and empirical interpretation of machine diagnostics of the local territorial development (Table 1):
(1) What are we diagnosing? – Local territorial development.
(2) How and with what tools do we make diagnostics? – Machine tools for diagnostics.
(3) On what basis do we make diagnostics? – Territorial analytic data, TAD.

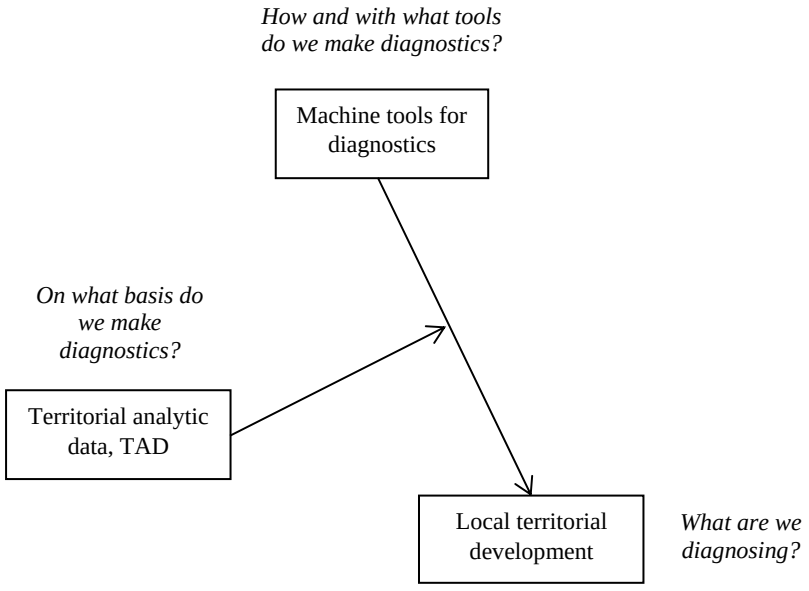


Figure 1. Interrelation of main structuring questions and terms / terminological constructions of the study
Source: own elaborated based on Table 1

In this study, the authors will use the methodological approach of discourse analysis (van Dijk, 1976, 2006; Komarova & Koroļova, 2021; Mietule et al., 2022), placing the diagnosed territories in the broader context of their sustainable development (including social, economic and environmental aspects). Considering the context of local territorial development, the conceptual framework of data-based machine diagnostics of the local

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

territorial development includes the following sequent mandatory concepts (without them, data-based machine diagnostics of the local territorial development is impossible) (Figure 2):

(1) Input for diagnostics – territorial analytic data, TAD;
(2) The subject of diagnostics – the context of the local territorial development and the state of development of territories;
(3) Method of diagnostics – cluster analysis of territories and SWOT analysis of territories;
(4) Machine tool for diagnostics - Statistical Package for Social Sciences (IBM SPSS) and Chat Generative Pre-Trained Transformer (ChatGPT 4o);
(5) Result of diagnostics – developmental types of territories and SWOT matrixes of territories;
(6) Output of diagnostics – the strengths, weaknesses, opportunities and threats for each territory in the context of the local territorial development.

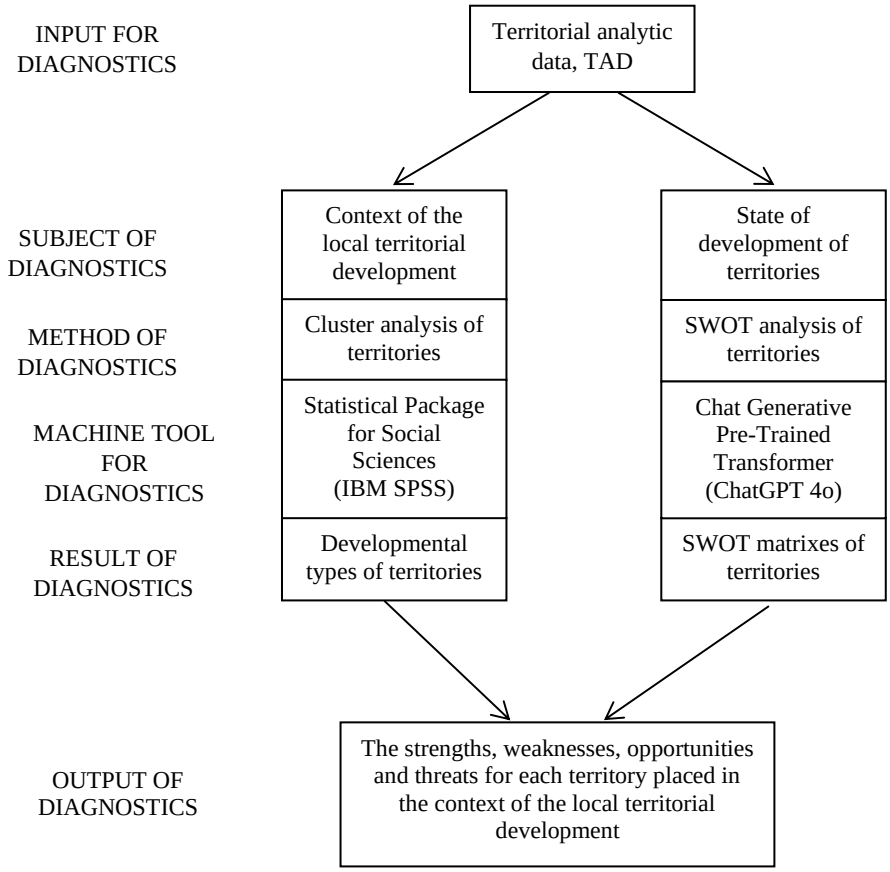


Figure 2. Conceptual framework of data-based machine diagnostics of the local territorial development
Source: own elaborated based on Simonova & Sykora, 2011a, 2011b; Sen et al., 2023; Xue et al., 2024

The object of this study is Latvian municipalities. The administrative division of Latvia into municipal territories (36 counties and 7 cities of national importance that are not part of the counties) is such from July 1, 2021, in accordance with the Law of the Republic of Latvia "On Administrative Territories and Settlements" (Saeima of Latvia, 2020). All municipalities of Latvia, both counties and cities of national importance, were included in the study sample, which consisted of 43 objects and coincided with the population (in statistical analysis – the entire set of items from which you draw data for a statistical study) of Latvian municipalities. Such a relatively small number of objects can be analysed by statistical methods (Kish, 1965) but requires increased attention to the statistical significance of the results obtained.

Daugavpils University's researchers highlight the disparities between centred and remote Latvian municipalities, both for the level of cities and counties (Kudiņš & Lazdāns, 2024). Capital-centred territories benefit from proximity to the metropolis and their infrastructure, while remote territories struggle with economic

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

isolation and environmental inefficiencies (Feng et al., 2019; van Leuven & Hill, 2021). In Latvia, the 100 km area around the capital is a "different world" compared to remote Latvia, located more than 100 km from Rīga. The current geopolitical situation and sanctions/restrictions against Russia and Belarus are not the reason for this situation since remote Latvian municipalities near the borders with Estonia and Lithuania have a similar social, economic and environmental context as remote municipalities near the borders with Russia and Belarus (Kudiņš & Lazdāns, 2024).

Figure 3 shows visual images of five types of territories in Latvia, obtained as a result of a two-level (for cities and counties) cluster analysis (Kudiņš & Lazdāns, 2024), namely:
(1) Riga, the capital of Latvia and its geographical, logistic, economic, etc. centre of the country (Cluster 1);
(2) capital-centered cities of Latvia (Ventspils, Yelgava, Yurmala), located close or relatively close to Riga, i.e. in the central areas (with the exception of Ventspils) (Cluster 2);
(3) remote cities of Latvia (Daugavpils, Liepaya, Rezekne), located far from Riga, i.e. in remote areas (Cluster 3);
(4) capital-centered counties of Latvia (17 municipalities), located close or relatively close to Riga (Cluster 4);
(5) remote counties of Latvia (19 municipalities), located far from Riga (Cluster 5).



Figure 3. Cartographic visualisation of the typology of Latvian municipalities
Source: Kudiņš & Lazdāns, 2024

Thus, socially, economically and environmentally developed Latvia can be outlined on a geographical map (Figure 3) using a compass, resting its leg on the point representing Riga. About the rest of the country's territory, if it were not for three relatively large industrial cities (Daugavpils, Liepaja, Rezekne), the political elite of Latvia would most likely prefer to forget completely, since many remote areas of Latvia are impossible to reach by land transport, especially under unfavourable weather conditions and in the off-season (Voronov, 2022; Chmielewski, 2023).

4. Results and discussion

As part of the empirical study, five Latvian municipalities (one from each typical cluster of Latvian territories) were selected for further SWOT analysis of the annual public reports of municipalities, carried out using AI tool and its standard methods of extracting and summarising key points from the analysed document. According to the research methodology, the task for AI tool (ChatGPT 4o) is the following (Table 1): Based on the attached

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

Public Report 2023 (in Latvian), conduct a SWOT analysis to understand the strengths, weaknesses, opportunities and threats for the municipality.

Table 2. SWOT matrix for Riga City (the capital of Latvia, Cluster 1), 2023

Strengths	Weaknesses
1. Economic Stability: Riga experienced a steady increase in budget revenue, particularly from income and property taxes. The city's budgetary income in 2023 exceeded expectations by €123.7 million, demonstrating a strong fiscal position. 2. Tourism and Transport Hub: Riga is a key destination for tourism, with a growing number of visitors. The city has a well-developed public transportation network, including trams, trolleybuses, and buses, along with an important seaport and proximity to Riga International Airport, which boosts the local economy. 3. Educational Investments: Significant resources are allocated to education, with €468.4 million (36% of the budget) directed towards educational development, ensuring quality and modernised facilities. 4. Strategic Infrastructure Projects: Riga has successfully implemented significant infrastructure projects, including road and transport upgrades, supported by EU funds. This includes projects like the Salu Bridge's reconstruction and the Eastern Highway's development.	1. Ageing Infrastructure: Some sectors, like public transport and urban infrastructure, still require significant upgrades. Persistent delays in construction and high costs hinder swift progress. 2. Demographic Challenges: The city's population has been declining since 2017, with a slight decrease in 2023 despite temporary growth due to migration from Ukraine. 3. Traffic and Congestion: Traffic congestion remains an issue in urban areas, requiring continuous investment and planning to improve mobility and reduce delays. 4. Economic Disparities: There is a noticeable income gap between the public and private sectors, with wages in the private sector trailing behind the public sector, potentially affecting employment dynamics.
Opportunities	**Threats**
1. EU Funding for Urban Development: The availability of EU funds offers opportunities for sustainable urban development, including green energy projects and public space revitalisation. 2. Tourism Growth: Increasing tourist numbers, especially from foreign countries, present opportunities for economic growth through the hospitality and service sectors. 3. Digital and Green Transition: Initiatives in digitalisation and green energy can position Riga as a leading city in innovation, attracting businesses and reducing environmental impact. 4. Business and Investment: Establishing business-friendly environments and infrastructure development can attract more foreign investment, fostering economic diversification.	1. Global Economic Instability: Economic fluctuations and global crises could impact tourism and investment, potentially affecting local revenue and business growth. 2. Environmental Risks: Climate change and rising sea levels pose risks to Riga's coastal areas, requiring investments in coastal protection and adaptation strategies. 3. Construction and Material Costs: High costs of construction materials and a shortage of skilled labourers may delay or limit the scope of essential urban development projects. 4. Dependence on Traditional Sectors: Reliance on established sectors like trade and transport can make the economy vulnerable to industry-specific downturns or technological shifts.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024

This SWOT analysis illustrates Riga's strengths in economic stability, education, and infrastructure while highlighting the challenges of ageing infrastructure, demographic decline, and the need for economic diversification (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024).

Analysing Public Report 2023 of Riga City Municipality, AI tool (ChatGPT 4o) adequately and based on the data obtained assessed the strengths of Riga City (economic stability, tourism and transport hub, educational investments, strategic infrastructure projects), its weaknesses (ageing infrastructure, demographic challenges, traffic and congestion, economic disparities), opportunities (EU funding for urban development, tourism growth, digital and green transition, business and investment), and threats (global economic instability, environmental risks, construction and material costs, dependence on traditional sectors) (Table 2). According to the authors, this means that AI tools must be actively used in the process of diagnosing local territorial development, as well as in the process of planning it.

The following two tables present SWOT matrixes for two Latvian cities: the capital-centred Yelgava City (Cluster 2) and remote Liepaja City (Cluster 3), located in the Kurzeme region of Latvia, near the shore of the Baltic Sea.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

Table 3. SWOT matrix for Yelgava City (the capital-centered city of Latvia, Cluster 2), 2023

Strengths	Weaknesses
1. Industrial Growth: Jelgava has a robust industrial sector with notable strengths in metalworking, mechanical engineering, woodworking, and food production. The processing industry contributes significantly to economic growth, with a high export share (75.7% in 2023). 2. Educational Investments: The city prioritises education, as seen in opening a new engineering-focused high school and modernised kindergartens, aiming to provide a contemporary learning environment. 3. Public Infrastructure Development: Ongoing infrastructure projects, such as road upgrades, water tourism facilities, and social service centres, enhance urban development and quality of life. 4. Strategic Location: Jelgava's location near Riga facilitates access to a larger job market and economic opportunities, making it an attractive place for residents and businesses.	1. Ageing Population: The demographic trend shows a declining and ageing population, which increases the demographic burden and affects the availability of a skilled workforce. 2. Economic Dependence on Traditional Industries: While industrial sectors are strong, there is a reliance on traditional industries, which may limit diversification and innovation in the economy. 3. Low Wage Growth: Jelgava's wage increase was the slowest among other major cities, leading many qualified professionals to seek employment in Riga for better salaries. 4. Infrastructure and Construction Challenges: The city faces delays in infrastructure projects due to high construction costs and a lack of skilled workers.
Opportunities	Threats
1. Expansion of Tourism and Cultural Projects: Jelgava can leverage its cultural and historical heritage to attract more tourists, enhancing its visibility and economy through events and infrastructure projects. 2. Renewable Energy Initiatives: Investments in clean and sustainable energy, such as infrastructure projects aligned with EU sustainability goals, offer a path for economic and environmental benefits. 3. EU and State Funding: Access to EU and state funds for public projects and infrastructure improvements presents opportunities to modernise the city's infrastructure and services. 4. Development of Industrial Parks: The creation of the Zemgale Industrial Park aims to revitalise degraded areas and attract private investments, promoting economic development.	1. Demographic Decline: A shrinking population with a growing number of elderly residents could strain social services and impact the city's long-term sustainability. 2. Economic Vulnerability: Dependency on traditional industrial sectors makes the city susceptible to global market fluctuations, impacting local businesses. 3. Environmental Challenges: As an industrial hub, Jelgava must address environmental concerns to maintain sustainable growth, especially in sectors like manufacturing and energy. 4. Competition from Riga: Proximity to Riga, while advantageous, also means competing for talent and businesses, as the capital city offers higher wages and more diverse job opportunities.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Yelgava City (Latvia), 2024

This SWOT analysis highlights Jelgava's strengths in industrial capacity and educational investment while acknowledging challenges related to demographics and economic diversification (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Yelgava City (Latvia), 2024).

According to the authors, the AI tool (ChatGPT 4o) also adequately and based on the data obtained, assessed the strengths of Yelgava City, its weaknesses, opportunities, and threats (Table 3). Although new for Latvian research (Arhipova & Paula, 2015; Voronov & Ruza, 2018; Grytten et al., 2024) is the fact that AI tool identified proximity to Riga of Yelgava City as a threat rather than an opportunity for local territorial development: "Proximity to Riga, while advantageous, also means competing for talent and businesses, as the capital city offers higher wages and more diverse job opportunities" (4th threat, Table 3).

Table 4. SWOT matrix for Liepaya City (the remote city of Latvia, Cluster 3), 2023

Strengths	Weaknesses
1. Industrial and Economic Growth: Liepāja is the second-largest manufacturing city in Latvia, with a well-established industrial sector that includes metalworking, machinery, textiles, and construction. The city has seen a notable increase in manufacturing output over the past five years. 2. Tourism and Culture: The city is a significant cultural centre with strong tourism potential, attracting visitors with its cultural events, historical sites, and coastal attractions. The construction of new cultural facilities, like the "Liedags" kindergarten, highlights ongoing investment in local infrastructure. 3. Port and Transport Infrastructure: Liepāja has a strategic port that supports logistics and international trade alongside well-	1. Demographic Challenges: Liepāja faces a declining and ageing population, which impacts the local labour force and poses challenges for long-term economic sustainability. 2. Unemployment Issues: The city has a relatively high unemployment rate, particularly among youth and long-term unemployed groups, which may indicate a skills mismatch in the local economy. 3. Economic Dependence on Traditional Industries: The economy heavily relies on traditional sectors like manufacturing and construction, with limited diversification into high-tech or innovative sectors. 4. Infrastructure Maintenance: While there is investment in new infrastructure, the maintenance and modernisation of existing

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

developed transport infrastructure. This includes enhancements in public transportation and road networks. 4. Educational Investments: The city has prioritised educational improvements, with modernised schools, kindergartens, and investment in professional training institutions that cater to local industry needs.	facilities, especially in older parts of the city, remain challenging .
Opportunities	Threats
1. Green and Sustainable Development: There are opportunities for Liepāja to invest in green energy and sustainable infrastructure aligned with EU funding and sustainability goals. This includes initiatives in renewable energy and waste management. 2. Tourism Expansion: Enhancing tourism through cultural events, coastal development, and improved facilities can drive economic growth, leveraging the city's cultural and natural assets. 3. Foreign Investment and Industrial Parks: Developing industrial parks and attracting foreign investments can boost the local economy, creating more jobs and diversifying the economy. 4. Cross-Border Cooperation: Liepāja's geographical position facilitates cooperation with neighbouring countries, enhancing trade, cultural exchange, and joint projects.	1. Global Economic Volatility: The city's reliance on manufacturing and exports makes it vulnerable to global economic shifts, particularly fluctuations in demand and supply chains. 2. Environmental Risks: As a coastal city, Liepāja faces risks from climate change, such as rising sea levels and extreme weather events, which could impact its port and tourism sectors. 3. Competition from Other Cities: Liepāja faces competition from other Latvian and Baltic cities for tourism, investment, and skilled labour, which could limit its growth potential. 4. Long-Term Demographic Trends: The ageing population and declining birth rates present a long-term challenge for sustaining a productive workforce and maintaining economic vitality.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Liepaja City (Latvia), 2024

This SWOT analysis underscores Liepāja's strengths in industry and cultural appeal while acknowledging the demographic and economic challenges that require strategic planning for sustainable development (elaborated by AI tool (ChatGPT 4o) based on the Municipal Council of Liepaja City (Latvia), 2024). According to the authors, the AI tool (ChatGPT 4o) also adequately assessed the strengths of Liepaja City, its weaknesses, opportunities, and threats based on the data obtained (Table 4). The following two tables present SWOT matrixes for two Latvian counties: the capital-centred Ropazhi County (Cluster 4) and remote Augshdaugava County (Cluster 5), located in the Latgale region of Latvia, near the border with Belarus.

Table 5. SWOT matrix for Ropazhi County (the capital-centered county of Latvia, Cluster 4), 2023

Strengths	Weaknesses
1. Population Growth and Engagement: Ropaži experienced strong population growth, particularly in the Stopiņi and Garkalne areas, driven by residential attractiveness and low unemployment. Community engagement is encouraged through each district's participatory budgeting and active consultative councils. 2. Economic Diversity and Business Support: The municipality supports a range of industries, including large and small enterprises, with a solid foundation in trade, processing, and construction. Support programs, such as grants and tax relief, foster local businesses. 3. Investment in Education and Infrastructure: Ropaži allocates a substantial portion of its budget to education and infrastructure, reflected in recent improvements to schools, sports facilities, and public utilities. 4. Commitment to Sustainability: Initiatives in renewable energy, such as solar power facilities and environmental projects, support the municipality's sustainable development goals.	1. Dependence on Surrounding Areas: The municipality relies on proximity to Riga and neighbouring municipalities for economic opportunities and employment, which may impact self-sufficiency. 2. Budgetary Constraints: Limited financial resources restrict the municipality's ability to expand services or fully maintain infrastructure, especially as the population grows. 3. Aging Infrastructure in Rural Areas: While urban centres receive improvements, maintaining and upgrading infrastructure in rural parts remains challenging. 4. Demographic Challenges: Although population growth is robust, the municipality faces long-term issues related to an ageing demographic, which could impact workforce availability and demand for social services.
Opportunities	Threats

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

1. Enhanced Regional and International Collaboration: Positioned near Riga, Ropaži has opportunities for partnerships on public services, tourism, and economic projects, including collaborations with international partners like Ukraine. 2. Development of Green and Sustainable Infrastructure: Ropaži has the potential for more eco-friendly projects, including green energy and sustainable urban planning, which aligns with available EU funding. 3. Growth in Tourism and Cultural Initiatives: Cultural and recreational projects like the Green Road initiative increase tourism and create new local business opportunities. 4. Digitalisation and Public Service Improvement: Investment in digital services can streamline public administration and increase accessibility for residents.	1. Environmental and Climate Risks: As a geographically diverse municipality, Ropaži faces potential environmental risks, such as flooding, that could impact infrastructure. 2. Economic Dependence on Key Industries: Reliance on specific industries, like trade and construction, exposes the municipality to market fluctuations. 3. Competition for Talent and Resources: Ropaži competes with Riga and other regions for skilled labour and investment, which may limit local growth and economic diversification. 4. Infrastructure Demand and Population Growth: The rapid population increase places pressure on public services and infrastructure, requiring continuous investment that may strain the budget.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Ropazhi County (Latvia), 2024

This SWOT analysis captures Ropaži's strengths in community growth, economic support, and sustainability while noting challenges related to budget constraints and infrastructure demands amidst population growth (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Ropazhi County (Latvia), 2024).

As in the case of the capital-centred Yelgava City, AI tool identified proximity to Riga of Ropazhi County as a threat rather than an opportunity for local territorial development: "Ropaži competes with Riga and other regions for skilled labour and investment, which may limit local growth and economic diversification" (3rd threat, Table 5).

Table 6. SWOT matrix for Augshdaugava County (the remote county of Latvia, Cluster 5), 2023

Strengths	Weaknesses
1. Diverse Economy: Augšdaugava's economy includes a wide range of industries, such as agriculture (especially mixed farming and grain production), retail, and transportation services like taxi and freight. 2. Investment in Public Infrastructure: The municipality has been actively implementing EU-funded investment projects, including energy efficiency measures, such as in public lighting and the renovation of public buildings. 3. Collaboration with Neighboring Regions: The municipality maintains strong cross-border cooperation with regions in Lithuania, Poland, and Georgia, which fosters opportunities for joint projects and resource sharing. 4. Support for Small and Medium-Sized Enterprises (SMEs): A relatively high number of registered businesses exist in the region, showing entrepreneurial activity and local economic participation.	1. Declining Population: There is a significant demographic challenge, with the number of deaths far exceeding births (97 births vs 525 deaths in 2023), leading to a shrinking and ageing population. 2. High Unemployment: While the unemployment rate in Augšdaugava is 7.7%, it remains higher than the national average (5.7%), and long-term unemployment affects a substantial part of the population. 3. Dependence on Traditional Industries: The economy heavily relies on agriculture and retail, which may limit growth in high-tech and knowledge-based industries. 4. Infrastructure Challenges in Education and Social Services: Some schools and social housing require modernisation, with several housing units reported as unsuitable for living without significant repair.
Opportunities	**Threats**
1. EU Funding for Sustainable Development: The municipality can continue to leverage EU structural funds to improve energy efficiency, modernise infrastructure, and support local industries. For example, improving public lighting and upgrading public buildings will help reduce energy consumption and emissions. 2. Tourism Potential: The restoration and promotion of cultural and natural heritage sites, such as "Latgales sēta" and Slutišķi 2, can enhance local tourism and economic growth. 3. Investment in Social Services: The municipality is implementing infrastructure improvements for social services, which can increase the quality of life, such as providing housing and care for vulnerable groups. 4; Green Transition: Investments in clean energy, like solar panel installations and electric vehicle infrastructure, offer opportunities for sustainable development.	1. Demographic Decline: With more deaths than births and significant long-term unemployment, the workforce is shrinking, which may pose challenges for sustaining economic growth. 2. Limited Diversification in Industry: The heavy reliance on agriculture and retail makes the local economy vulnerable to external shocks in these sectors. 3. Regional Disparities: The rural nature of many parts of Augšdaugava could hinder access to services, education, and employment opportunities compared to more urbanised areas. 4. Environmental Risks: Projects aimed at cleaning historically polluted sites (like Višķu mazuta glabātava) indicate a potential environmental risk that, if not correctly managed, could harm local health and development.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Augshdaugava County (Latvia), 2024

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

This SWOT analysis highlights the municipality's strengths in infrastructure and partnerships, but also the challenges posed by demographic trends and economic dependence on traditional sectors (elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Augshdaugava County (Latvia), 2024).

Thus, AI tool (ChatGPT 4o) demonstrates a strong and even original (critical attitude towards proximity to Riga as a stimulus of local territorial development) ability for SWOT analysis of annual public reports of Latvian municipalities, while also maintaining the context of local territorial development, i.e. type of Latvian territories, which is reflected in the analysed documents.

The authors also tried an experiment by asking AI tool (ChatGPT 4o) to conduct a SWOT analysis again for Riga City based on the same data (Municipal Council of Riga City (Latvia), 2024), but within separate communication sessions. The following table compares two versions of the SWOT matrixes for Riga City.

Table 7. Comparison of two versions of the SWOT matrixes for Riga City (the capital of Latvia, Cluster 1), 2023

1st version	2nd version
Strengths	Strengths
1. Economic Stability: Riga experienced a steady increase in budget revenue, particularly from income and property taxes. The city's budgetary income in 2023 exceeded expectations by €123.7 million, demonstrating a strong fiscal position. 2. Tourism and Transport Hub: Riga is a key destination for tourism, with a growing number of visitors. The city has a well-developed public transportation network, including trams, trolleybuses, and buses, along with an important seaport and proximity to Riga International Airport, which boosts the local economy. 3. Educational Investments: Significant resources are allocated to education, with €468.4 million (36% of the budget) directed towards educational development, ensuring quality and modernised facilities. 4. Strategic Infrastructure Projects: Riga has successfully implemented major infrastructure projects, including road and transport upgrades, supported by EU funds. This includes projects like the Salu Bridge's reconstruction and the Eastern Highway's development.	1. Financial Stability: The municipality showed financial growth, with increased tax revenues such as the personal income tax and property tax, surpassing planned expectations. 2. Infrastructure Investment: Significant capital investments in infrastructure, particularly in transportation, have been made to improve the city's quality of life. 3. Effective Debt Management: The municipality maintained a manageable debt level, adhering to financial strategies that allow continued investments in city development. 4. Positive Credit Rating: An "A" level credit rating with a stable outlook supports investor confidence and indicates financial soundness.
Weaknesses	Weaknesses
1. Ageing Infrastructure: Some sectors, like public transport and urban infrastructure, still require significant upgrades. Persistent delays in construction and high costs hinder swift progress. 2. Demographic Challenges: The city's population has been declining since 2017, with a slight decrease in 2023 despite temporary growth due to migration from Ukraine. 3. Traffic and Congestion: Traffic congestion remains an issue in urban areas, requiring continuous investment and planning to improve mobility and reduce delays. 4. Economic Disparities: There is a noticeable income gap between the public and private sectors, with wages in the private sector trailing behind the public sector, potentially affecting employment dynamics.	1. Declining Population: A steady decrease in population over recent years poses challenges in maintaining a sustainable tax base and workforce. 2. Budget Deficit: Although reduced, a budget deficit still exists, which could affect future investments if not adequately managed. 3. Limited Sectoral Development: Some economic sectors, like industrial manufacturing, have a lower contribution than others, suggesting a need for diversification. 4. Dependence on EU Funds: Heavy reliance on European Union funds for infrastructure projects could pose a risk if future funding decreases.
Opportunities	Opportunities
1. EU Funding for Urban Development: The availability of EU funds offers opportunities for sustainable urban development, including green energy projects and public space revitalisation. 2. Tourism Growth: Increasing tourist numbers, especially from foreign countries, present opportunities for economic growth through the hospitality and service sectors. 3. Digital and Green Transition: Initiatives in digitalisation and green energy can position Riga as a leading city in innovation, attracting businesses and reducing environmental impact.	1. Urban Development: Planned infrastructure projects, including transport improvements and real estate developments, present opportunities for urban growth and increased economic activity. 2. EU and International Funding: The availability of EU funds and other international investments can boost city development, especially in green and sustainable initiatives. 3. Increasing Tourism: A rebound in tourism, focusing on attracting more international visitors, can revitalise the hospitality sector and related industries.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

4. Business and Investment: Establishing business-friendly environments and infrastructure development can attract more foreign investment, fostering economic diversification.	4. Public Transport Improvements: Investments in public transportation and mobility reforms can increase accessibility and reduce traffic congestion.
Threats	Threats
1. Global Economic Instability: Economic fluctuations and global crises could impact tourism and investment, potentially affecting local revenue and business growth. 2. Environmental Risks: Climate change and rising sea levels pose risks to Riga's coastal areas, requiring investments in coastal protection and adaptation strategies. 3. Construction and Material Costs: High costs of construction materials and a shortage of skilled labourers may delay or limit the scope of essential urban development projects. 4. Dependence on Traditional Sectors: Reliance on established sectors like trade and transport can make the economy vulnerable to industry-specific downturns or technological shifts.	1. Economic Fluctuations: Global and regional economic instability could impact tax revenues and financial health, leading to potential budget constraints. 2. Inflation and Wage Pressure: Rising wage demands and inflation could increase the cost of public services, impacting budget planning. 3. Aging Infrastructure: Persistent needs for infrastructure renewal, particularly in transport, require constant funding, and delays could worsen the city's condition. 4. Environmental and Climate Risks: As with many urban areas, Riga faces challenges related to climate change, requiring significant investments in green infrastructure.
Summary	Summary
This SWOT analysis illustrates Riga's strengths in economic stability, education, and infrastructure while highlighting the challenges of ageing infrastructure, demographic decline, and the need for economic diversification.	This SWOT analysis highlights the key factors influencing Riga's municipal strategy and planning for future development.

Source: elaborated by AI tool (ChatGPT 4o) based on Municipal Council of Riga City (Latvia), 2024

Recognising the general similarity of the two versions of the obtained SWOT matrixes for the Riga City (Table 7), the authors would prefer to use the first version and reject the second for the following reasons:

(1) In the second version, the strengths are focused exclusively on financial aspects;
(2) The ageing infrastructure is not a threat, as suggested in the second version, but rather an internal weakness of Riga City, as presented in the first version;
(3) The summary of the second version does not contain any specific details for Riga City.

In their further analysis, the authors tried to understand why two different SWOT analysis summaries (Table 7) emerged from the same data and the same question to AI tool. The authors' next question to ChatGPT 4o was the following: Have you applied different techniques or methods for their creation? The first version's answer: "The two summaries provided for the SWOT analysis of Riga are not based on fundamentally different techniques or methods; rather, the differences arise from a variation in focus and language used when generating the summaries" (ChatGPT 4o). The second version's answer: "The two summaries you've mentioned reflect slight variations in emphasis and interpretation, even though they are based on the same document and question" (ChatGPT 4o). The key phrases in both answers are "variation in focus" and "variation in emphasis".

Therefore, the next question for the first version was, "Do you decide this focus yourself?" and for the second: "Do you decide this emphasis yourself?" The first version's answer: "Yes, the decision to focus on specific elements within a summary is made by me, but it is not random; it is influenced by both technical and non-technical factors" (ChatGPT 4o). The second version's answer: "The emphasis in the summaries is not random. It is based on a combination of technical and non-technical factors" (ChatGPT 4o). The last authors' question for both versions of the communication with AI tool was: Can you change your focus or emphasis within one separate conversation? The first version's answer: "No, I don't independently change my focus or emphasis within a single conversation unless prompted by changes in your question, context, or specific preferences" (ChatGPT 4o). The second version's answer: "No, I won't change my focus or emphasis within a single conversation on my own unless you provide new input or specify a shift" (ChatGPT 4o).

According to the authors, the results of this experiment showed that AI tool can choose a different focus/emphasis for the data-based diagnostics of the local territorial development. However, this will remain the same focus/emphasis within a single communication session. This means that the human analyst can select the most correct and relevant focus/emphasis and continue the diagnostics process within the chosen focus/emphasis.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

5. Conclusions

This study analysed the capabilities of an AI tool (ChatGPT 4o) for data-based machine diagnostics of the local territorial development, focusing on Latvian municipalities. Based on empirical research involving SWOT analysis of annual public reports for five selected municipalities, the following conclusions were drawn:

(1) The AI tool demonstrated its ability to conduct comprehensive SWOT analyses, accurately identifying strengths, weaknesses, opportunities, and threats for each municipality. This included unique insights, such as identifying proximity to Riga as a competitive threat rather than an opportunity for some municipalities, highlighting its nuanced approach to contextual data;
(2) The tool showed flexibility in its diagnostic focus and emphasis, which could be tailored to specific analytical needs. While consistent focus is maintained within a single session, human analysts can steer the tool toward the most relevant emphasis, ensuring precision and relevance;
(3) AI-driven diagnostics integrated contextual considerations of social, economic, and environmental factors, enabling a more balanced approach to territorial development. The tool also proved capable of identifying opportunities aligned with sustainable growth, such as green energy projects and digitalisation initiatives;
(4) By providing actionable insights through SWOT matrices, the AI tool offers significant value for policymakers, enabling them to effectively address challenges such as demographic decline, economic dependencies, and environmental risks.

The study also faced challenges and limitations, such as a lack of empirical data and high-resolution inputs for more granular analysis. Additionally, reliance on AI tools requires human oversight to interpret and apply insights accurately within the broader context of regional development.

Beyond Latvia, the demonstrated methodology can be applied to other regional contexts, enabling comparative studies and fostering collaborative approaches to territorial diagnostics and planning. Recommendations for future research are as follows: conduct empirical studies across diverse regions to validate the AI tool's adaptability and accuracy; develop more refined data inputs, including multi-source and high-resolution datasets, to improve diagnostic granularity; explore integration of AI tools with Geographic Information Systems (GIS) and Internet of Things (IoT) for real-time monitoring and predictive analytics; expand use cases for AI-driven diagnostics to include longitudinal studies on the impact of policy decisions informed by such tools; focus on enhancing stakeholder engagement by integrating AI-generated insights into participatory decision-making processes. By addressing these recommendations, future research can further advance the utility and reliability of AI for sustainable local territorial development diagnostics.

References

Abele, L., Rivza, B., Rivza, P., & Markus, K. (2023). Green competitiveness and digitalisation in Latvia municipalities. *23rd SGEM International Multidisciplinary Scientific GeoConference 2023.* https://doi.org/10.5593/sgem2023/5.1/s20.18

Arhipova, I., & Paula, L. (2015). Regional development and private consumption structure in Latvia. *Procedia Economics and Finance*, 26, 86–91. https://doi.org/10.1016/S2212-5671(15)00963-6

.Arnould, M., Morel, L., & Fournier, M. (2020). Developing a territorial diagnostic as part of a living lab process: Implementation to improve management and wood mobilisation in small French private forest. *2020 IEEE International Conference on Engineering, Technology and Innovation (ICE/ITMC)*. Cardiff (UK), pp. 1–9. https://doi.org/10.1109/ICE/ITMC49519.2020.9198373

Aslaeva, S.S. (2020). Diagnostics of the development of territorial entities. *Azimuth of Scientific Research Economics and Administration*, 9 (32). https://doi.org/10.26140/anie-2020-0903-0014

Bertacchini, Y., & Bouchet, Y. (2016). Territorial intelligence & artificial intelligence: On discussion. *British Journal of Applied Science & Technology*, 4 (5), 155–168.

Chao, J., & Tao, Zh. (2023). Research on regional integration development and artificial intelligence development under the background of regional economic integration – Taking China's Yangtze River Delta and Pearl River Delta as examples. *AEBMR*, 231, 1369–1378. https://doi.org/10.2991/978-94-6463-098-5_155

Cervera, J.L. (2021). Designing a territorial development monitoring system. *News.* Retrieved on October 23, 2024, from https://decentralization.ua/en/news/13779?page=298

Chehabeddine, M., & Tvaronavičienė, M. (2020). Securing regional development. *Insights into Regional Development,* 2 (1), 430–442. http://doi.org/10.9770/IRD.2020.2.1(3)

Chmielewski, B. (2023). Far behind Riga: Latvia's problems with uneven development, *OSW Commentary,* 498. Retrieved on October 23, 2024, from https://www.osw.waw.pl/sites/default/files/OSW%20Commentary%20498.pdf

van Dijk, T. (1976). Narrative macro-structures. Logical and cognitive foundations. *PTL: A Journal for Descriptive Poetics and Theory of Literature,* 1, 547–568. Retrieved on October 23, 2024, from http://www.discourses.org/OldArticles/Narrative%20macrostructures.pdf

van Dijk, T. (2006). Ideology and Discourse Analysis. *Journal of Political Ideologies,* 11 (2), 115–140. https://doi.org/10.1080/13569310600687908

European Commission. (2024). SWOT analysis – strengths, weaknesses, opportunities and threats. *Supporting Tools.* Retrieved on October 23, 2024, from https://wikis.ec.europa.eu/display/ExactExternalWiki/SWOT+analysis+-+strengths%2C+weaknesses%2C+opportunities+and+threats

Feng, W., Liu, Y., & Qu, L. (2019). Effect of land-centered urbanisation on rural development: A regional analysis in China. *Land Use Policy*, 87, 104072. https://doi.org/10.1016/j.landusepol.2019.104072

Grybaite, V., & Tvaronavičiene, M. (2008). Estimation of sustainable development: germination on institutional level. *Journal of Business Economics and Management,* 9 (4), 327–334. https://doi.org/10.3846/1611-1699.2008.9.327-334

Grytten, O.H., Norkus, Z., Markevičiūtė, J., & Šiliņš, J. (2024). A long-run perspective on Latvian regional gross domestic product inequality, 1925–2016. *Baltic Journal of Economics*, 24 (1), 88–115. https://doi.org/10.1080/1406099X.2024.2325232

Hu, R., Bao, Z., Lin, Zh., & Lv, K. (2024). The innovative construction of provinces, regional artificial intelligence development, and the resilience of regional innovation ecosystems: Quasi-natural experiments based on spatial difference-in-differences models and double machine learning. *Sustainability*, 16 (18), 8251. https://doi.org/10.3390/su16188251

Kish, L. (1965). Survey Sampling. New York: John Wiley and Sons.

Komarova, V., & Koroļova, S. (2021). Social context of creation, translation and perception of textbooks on economics of the 1990s, 2000s and 2010s. *Sociālo Zinātņu Vēstnesis = Social Sciences Bulletin,* 32 (1), 25–60. https://doi.org/10.9770/szv.2021.1(2)

Komarova, V., Ignatjeva, S., Kudins, J., Kokarevica, A., Ostrovska, I., & Čižo, E. (2024). Latvian municipal budget expenditures on transport infrastructure and production in the context of improving the local economy. *Journal of Eastern European and Central Asian Research,* 11 (4), 736–753. https://doi.org/10.15549/jeecar.v11i4.1608

Kudiņš, J., & Lazdāns, D. (2024). Transport development of Latvian municipalities in the context of spatial inequality. *Sociālo Zinātņu Vēstnesis = Social Sciences Bulletin,* 39 (2), 7–29. https://doi.org/10.9770/szv.2024.2(1)

Laurini, R. (2023). Promises of artificial intelligence for urban and regional planning and policymaking. In: *Knowledge Management for Regional Policymaking* (pp. 3–20). https://doi.org/10.1007/978-3-031-15648-9_1

van Leuven, A. J., & Hill, E. W. (2021). Legacy regions, not legacy cities: Growth and decline in city-centered regional economies. *Journal of Urban Affairs, 45* (10), 1860–1883. https://doi.org/10.1080/07352166.2021.1990775

Mietule, I., Komarova, V., Ostrovska, I., Ignatyevs, S., & Heimanis, B. (2022). Economic texts as a reflection of the social reality of the transition period in Latvia and Russia. *RUDN Journal of Sociology,* 22 (1), 168–185. https://doi.org/10.22363/2313-2272-2022-22-1-168-185

Municipal Council of Augshdaugava County (Latvia). (2024). *Public Report 2023 of Augshdaugava County Municipality.* Retrieved on October 23, 2024, from https://www.varam.gov.lv/lv/pasvaldibu-2023-gada-publiskie-parskati

Municipal Council of Liepaya City (Latvia). (2024). *Public Report 2023 of Liepaya City Municipality.* Retrieved on October 23, 2024, from https://www.varam.gov.lv/lv/pasvaldibu-2023-gada-publiskie-parskati

Municipal Council of Riga City (Latvia). (2024). *Public Report 2023 of Riga City Municipality.* Retrieved on October 23, 2024, from https://www.varam.gov.lv/lv/pasvaldibu-2023-gada-publiskie-parskati

Municipal Council of Ropazhi County (Latvia). (2024). *Public Report 2023 of Ropazhi County Municipality.* Retrieved on October 23, 2024, from https://www.varam.gov.lv/lv/pasvaldibu-2023-gada-publiskie-parskati/

Municipal Council of Yelgava City (Latvia). (2024). *Public Report 2023 of Yelgava City Municipality.* Retrieved on October 23, 2024, from https://www.varam.gov.lv/lv/pasvaldibu-2023-gada-publiskie-parskati

Nadtochiy, I., Irtyshcheva, I., Krylenko, V., Tkach, V., Kramarenko, I., & Chumakov, K. (2022). Economic diagnostics of territorial development: National dimension and experience of EU countries. *WSEAS Transactions on Environment and Development,* 18, 486–495. https://doi.org/10.37394/232015.2022.18.47

Saeima of Latvia. (2020). Law on administrative territories and populated areas. *Latvijas Vēstnesis = Bulletin of Latvia,* 119C. Retrieved on October 23, 2024, from https://likumi.lv/ta/en/en/id/315654

Sen, M., Sen, S.N., & Sahin, T.G. (2023). A new era for data analysis in qualitative research: ChatGPT. *Shanlax International Journal of Education*, 11 (S1-Oct), 1–15. https://doi.org/10.34293/education.v11iS1-Oct.6683

Simonova, S., & Sykora, D. 2011a. Process modeling for regional territorial planning. *Proceedings of the European Computing Conference*, 410–414. Retrieved on October 23, 2024, from https://www.researchgate.net/publication/228415260_Process_modeling_for_regional_territorial_planning

Simonova, S., & Sykora, D. 2011b. Metrics of data model for regional territorial planning. *International Journal of Systems Applications, Engineering & Development*, 5 (5), 642–649. Retrieved on October 23, 2024, from https://www.naun.org/main/UPress/saed/20-779.pdf

Suárez-Roldán, C., Hernández-Atencia, Y., & Méndez-Giraldo, G. (2024). Method of selection of rural territory in the development of a territorial diagnosis. *Journal of Engineering*, 1, 8795216. https://doi.org/10.1155/2024/8795216

Voronov, V.V., & Ruza, O. P. (2018). Youth unemployment in the Latgale region of Latvia: causes and consequences. *Baltic Region*, 10 (4), 88–102. https://doi.org/10.5922/2079-8555-2018-4-6

Voronov, V.V. (2022). Small towns of Latvia: disparities in regional and urban development. *Baltic Region*, 14(4), 39–56. https://doi.org/10.5922/2079-8555-2022-4-3

Xue, B., Xu, Y., Yang, J., & Xiao, X. (2024). Applications in machine learning in national territory spatial planning. *Applied Sciences*, 14 (10), 4045. https://doi.org/10.3390/app14104045

Yigitcanlar, T., Senadheera, S., Marasinghe, R., Bibri, S.E., Sanchez, Th., Cugurullo, F., & Sieber, R. (2024). Artificial intelligence and the local government: A five-decade scientometric analysis on the evolution, state-of-the-art, and emerging trends. *Cities*, 152, 105151. https://doi.org/10.1016/j.cities.2024.105151

Funding: This research was funded by Daugavpils University, Latvia.

Author Contributions: Conceptualisation: *Vera Komarova, Janis Kudins*; methodology: *Vera Komarova, Aija Sannikova*; data analysis: *Edmunds Čižo, Oksana Ruza*, writing—original draft preparation: *Janis Kudins, Oksana Ruza*, writing; review and editing: *Anita Kokarevica, Zane Zeibote*; visualisation: *Edmunds Čižo*. All authors have read and agreed to the published version of the manuscript.

Vera KOMAROVA is Dr.oec., Mg. translat., the Leading researcher at the Social Investigations Centre of the Institute of Humanities and Social Sciences of Daugavpils University (Latvia). Research interests: regional economics, sustainable development, economic research methodology, quantitative research methods.
ORCID ID: https://orcid.org/0000-0002-9829-622X

Janis KUDINS is a Science Doctor (Ph.D.) in Social Sciences, Assistant professor at the Department of Law, Management Science and Economics of Faculty of Humanities and Social Sciences of Daugavpils University (Latvia). Research interests: territorial development, economic data analysis, machine learning.
ORCID ID: https://orcid.org/0000-0002-5870-8023

Aija SANNIKOVA is Dr.oec., Assistant professor at the EKA University of Applied Sciences (Latvia). Research interests: economic research methodology, economic terminology, statistical analysis.
ORCID ID: https://orcid.org/0000-0003-1364-4035

Edmunds ČIŽO is a Science Doctor (Ph.D.) in Economics and Business, Assistant professor at the Department of Law, Management Science and Economics of Faculty of Humanities and Social Sciences of Daugavpils University (Latvia). Research interests: regional economics, sustainable economic development, economic research design.
ORCID ID: https://orcid.org/0000-0003-0654-2962

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/y3784695648

Oksana RUZA is Dr.oec., Assistant professor, Researcher at the Social Investigations Centre of the Institute of Humanities and Social Sciences of Daugavpils University (Latvia). Research interests: regional economics, economic research methodology, statistical analysis.
ORCID ID: https://orcid.org/0000-0002-6194-3841

Anita KOKAREVICA is a Science Doctor (Ph.D.) in Economics and Business, Assistant professor at the Department of Public Health and Epidemiology of the Faculty of Public Health and Social Welfare of Riga Stradinsh University (Latvia). Research interests: regional economics, sustainable economic development, quantitative research methods, economic terminology.
ORCID ID: https://orcid.org/0000-0001-6173-0910

Zane ZEIBOTE is Dr.oec., Researcher at the Faculty of Business, Management and Economics of University of Latvia (Latvia). Research interests: economic research design, economic terminology, machine learning in data analysis.
ORCID ID: https://orcid.org/0000-0003-4571-6515

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

Publisher
http://jssidoi.org/esc/home

TOWARDS CIRCULAR ECONOMY THROUGH NOVEL WASTE RECYCLING TECHNOLOGIES

Kristina Baziene [1]*, Justinas Gargasas [2], Surya Rajendran [3], Jordan Nathan Solomon [4]

[1,2,3,4] *Vilnius Gediminas Technical University, Department of Mechanical and Materials Engineering, Saulėtekio al. 11, LT-10223, Vilnius, Lithuania*

E-mails:[1] kristina.baziene@vilniustech.lt (Corresponding author); [2]justinas.gargasas@vilniustech.lt; [3] surya.rajendran@stud.vilniustech.lt; [4] jordan-nathan.solomon@stud.vilniustech.lt*

Received 15 September 2025; accepted 10 December 2024; published 30 December 2024

Abstract. The shift towards a circular economy is gaining momentum as a crucial strategy to address environmental sustainability challenges, particularly the growing concerns related to waste management and resource depletion. In this context, novel waste recycling technologies are emerging as vital components in transforming waste into valuable resources, closing the loop in production and consumption cycles. Traditional linear 'take, make, dispose' systems are being replaced by innovative technologies that aim to reduce waste generation, extend product life, and recover resources from end-of-life products. This paper explores the role of new waste recycling technologies in advancing the circular economy. Key technologies such as pyrolysis, hydrothermal liquefaction, chemical recycling, and biotechnological approaches are discussed for their potential to handle diverse waste streams, including plastics, electronics, and organic. Each technology is evaluated in terms of its ability to convert waste into valuable secondary raw materials like fuels, chemicals, and bioplastics, and its contributions to reducing environmental footprints. Furthermore, the paper highlights integrating these technologies within the circular economy framework, focusing on how they contribute to reducing reliance on virgin resources, minimising waste sent to landfills, and decreasing carbon emissions. Case studies are presented to demonstrate successful applications of novel recycling methods in industry, showing their scalability, economic viability, and environmental benefits. In conclusion, novel waste recycling technologies are essential for achieving the objectives of a circular economy, offering pathways to a more sustainable and resource-efficient future. However, further research, policy support, and technological development are needed to overcome challenges such as economic feasibility, regulatory barriers, and technological scalability, ensuring that these innovations can be effectively integrated into global waste management systems.

Keywords: circular economy; renewable energy; decarbonisation; pyrolysis oil technology; plastic waste recycling

Reference to this paper should be made as follows: Baziene, K., Gargasas, J., Rajendran, S., Solomon, J.N. 2024. Towards circular economy through novel waste recycling technologies. *Entrepreneurship and Sustainability Issues*, 12(2), 460-472. http://doi.org/10.9770/m5297249738

JEL Classifications: R20

Additional disciplines: ecology and environment, environmental engineering; and energetics

1. Introduction

The circular economy is a sustainable economic model that contrasts with the traditional linear economy, which follows a "take, make, dispose" pattern. Instead, the circular economy focuses on keeping products, materials, and resources in use for as long as possible, maximising their value, and minimising waste. When applied to plastic waste, the circular economy emphasises reducing the environmental impact of plastic production and consumption, improving recycling processes, and reusing materials rather than discarding them after a single use. Decarbonisation using synthetic fuels derived from plastic waste is an emerging approach that could help

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

mitigate the environmental impact of both plastic pollution and fossil fuel consumption. This method focuses on converting waste plastics into synthetic fuels (such as diesel, gasoline, or jet fuel) through various processes, contributing to reducing carbon emissions. Plastic waste has emerged as a pressing environmental concern globally, with significant implications for ecosystems, public health, and resource management. The escalating volume of plastic waste generated each year exacerbates challenges associated with conventional disposal methods and underscores the urgent need for innovative waste management solutions. Among these solutions, converting waste plastics into fuel energy through pyrolysis represents a promising avenue for mitigating the environmental burden of plastic pollution and the growing demand for sustainable energy sources. The conversion of waste plastics into fuel energy via pyrolysis offers a promising solution that not only diverts plastic waste from landfills but also generates valuable energy products, including liquid fuels, gases, and char. This approach aligns with the principles of the circular economy by transforming waste into resources, thereby reducing reliance on fossil fuels and contributing to the transition towards a more sustainable energy system.

2. Literature Review

Plastic waste, which is largely made from petrochemicals, can be transformed into synthetic fuels through several key technologies: pyrolysis and gasification. Pyrolysis converts plastic into various products, including synthetic crude oil, which can be refined into fuels. This process involves heating plastic waste without oxygen to break it into smaller molecules. Pyrolysis is a thermochemical process that can convert waste plastic into valuable products such as gas, liquid, and solid residue. It involves the decomposition of plastics at high temperatures in the absence or with little oxygen supply (Kabeyi & Olanrewaju, 2023). The process can be carried out using different types of plastics, including polypropylene (PP), polystyrene (PS), and polyethene (PE) (Pharande & Bagwan, 2023**)**. The plastic waste is first sorted and crushed before being fed into a reactor maintained at about 500°C. Nitrogen gas is used to create an inert environment and aid in fluidisation (Aisien, & Aisien, 2023). The cracked gas produced is then condensed and separated using cyclone separators and electrostatic precipitators. The resulting products include gaseous fuel, liquid, and residue. The yield of these products can vary depending on the temperature used in the process (Kafle et al., 2023).

Plastic waste originates from the degradation or disposal of polymeric materials. When plastic products degrade or are discarded, they contribute to the accumulation of plastic waste. Plastic waste generation occurs when plastic materials are rendered obsolete or unusable (Pharande & Bagwan, 2023). The production and consumption of plastics are key contributors to the formation of plastic waste. Their versatility and affordability drive the widespread adoption of plastics. Approximately 4% of the global oil and gas output is allocated for plastics manufacturing. Pyrolysis offers a method to convert plastic waste into oil. (Kabeyi & Olanrewaju, 2023). The different manufacturing processes of plastic products generate plastic waste (Pannucharoenwong et al., 2023). The plastic waste is produced by solar panels, which are necessary for transitioning towards renewable energy (Tvaronavičienė, 2024). The growth of industrial development and a vast population increased the use of plastics enormously (Evode et al., 2021). Plastic waste comprises a mixture of various plastic polymers. Projections suggest that by the year 2050, global plastic waste is estimated to reach 12 billion tons (Aisien & Aisien, 2023).

Plastics are manufactured substances derived from polymers, which consist of extensive chains of repeating units. There are several types of plastics (Figure 1), each characterised by its unique chemical composition and properties.

The circular economy for waste recycling is a sustainable approach aimed at minimising waste and maximising resource efficiency. It contrasts with the traditional linear model (take, make, dispose) by keeping materials in use for as long as possible through recycling, reuse, and upcycling. Below are key principles, strategies, and examples of circular economy applications in waste management. Products should be designed to be easily dismantled, repaired, or upgraded, allowing their components to be recycled or reused. Plastic waste can be converted into pellets to produce new plastic products, while organic waste can be transformed into compost or bioenergy.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738



Figure 1. Six common types of plastics.
Source: Chang (2023)

Recent literature highlights advancements in the circular economy and the remaining challenges in scaling up plastic recycling and reducing plastic consumption. Key studies and reports have provided significant insights into plastic waste management and strategies for transitioning toward a circular economy. Khandelwal et al. (2019) evaluate the potential for chemical recycling and its role in reducing carbon emissions compared to mechanical recycling. They conclude that chemical recycling offers a more sustainable solution for difficult-to-recycle plastics but remains economically challenging and requires further technological advancements (Khandelwal et al., 2019). Geyer et al. (2020) discuss the widespread inefficiencies in the global recycling system and the need for improved infrastructure and systems to ensure that plastic waste is adequately processed and reused. It suggests that a more integrated approach to recycling, including supporting circular supply chains, is necessary for achieving sustainability goals (Geyer et al., 2020). Effective recycling depends on technological advancements, consumer participation, and proper waste management practices. Research highlights that changing consumer behaviour and raising awareness about the importance of recycling is crucial for circularity (Bocken et al., 2016). Fahim et al. (2021) analysed the prospects of using pyrolysis to convert plastic to liquid oil. The authors stated that produced liquid oil had a higher calorific value than fossil fuel. This novel waste recycling could be used to develop more circular business models. Entrepreneurship has to be integrated into chemistry and engineering education (Ead et al., 2023).

There are multiple ways of producing energy or useful products from waste plastics. The methods and ways are developing each day. Innovation in polymerisation projects is developing very quickly. There are several types of energy production from waste plastics. One method is plasma gasification, which converts plastic waste into fuel oil using a plasma reactor (Galaly & Dawood, 2023). Another method is pyrolysis, which involves heating plastic waste in a low-oxygen environment to produce synthesis gas, which can be used to generate electricity, create transportation fuels, or produce chemicals (Moroliya et al., 2023). Mechanochemical methods can also be used, where polymer wastes are converted to fuel gases through ball-milling with oxidants. (Nguyen & Tuan, 2022). Catalysis-pyrolysis is another approach, where waste plastics are converted to gasoline, syngas, and carbon nanotubes using catalysts. (Chow et al., 2021). These methods offer alternatives to fossil fuels and contribute to waste management by converting plastic waste into valuable energy resources.

Pyrolysis is a process where waste plastics are heated in an environment devoid of oxygen, forming synthesis gas. This gas can serve various purposes, including electricity generation, the production of transportation fuels, and the synthesis of chemicals. (Moroliya et al., 2023). Pyrolysis continues to gain traction as a promising technology for multiple applications beyond waste management. Here are some notable areas where pyrolysis is being utilised or explored:

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

Plastic recycling pyrolysis can break down plastic waste into valuable products like liquid fuels, waxes, and chemicals. This offers a promising solution for plastic recycling, particularly for plastics that are difficult to recycle through traditional mechanical methods due to contamination or complex composition.

Carbon capture and utilisation pyrolysis can play a role in carbon capture and utilisation (CCU) strategies by converting carbon-rich feedstocks into valuable products like biochar or activated carbon. These products can be used for applications such as soil amendment, water purification, and carbon sequestration. (Pandey et al, 2020).

Pyrolysis represents a pivotal anaerobic thermochemical process that breaks down lengthy carbonaceous materials within an inert gas environment, often at heightened temperatures. This process can occur either with or without the assistance of a catalyst. When no catalyst is utilised, it's termed thermal pyrolysis, while the involvement of a catalyst results in catalytic pyrolysis. Plastic waste undergoes pyrolysis and typically yields three primary products: plastic oil (which can exist in liquid or waxy form), non-condensable gases encompassing CH4, H2, CO, and CO2, and a carbon-rich solid char residue. The liquid plastic oil primarily comprises aliphatic compounds along with mono- and polyaromatics. This oil finds utility across various applications, such as direct usage in steam boilers for power generation or as a foundational compound for processes like monomer recovery, carbon nanotube production, and the fabrication of transportation fuels.
Conversely, the waxy plastic oil comprises long-chain alkanes and alkenes exceeding C20, possessing notably high boiling points (>500 °C). This type of oil necessitates additional processing, often through techniques like fluid catalytic cracking, to transform it into liquid fuels or other valuable petrochemical products. (Chang, 2023). These reactors have the properties of breaking down the carbon chain of different plastics. Each reactor's efficiency of burning plastics and processing time will be changed. The fixed bed reactors are the ones that are easy to operate, simple to operate, and easy to manufacture; it doesn’t need any special skill to work on it. It takes longer to settle down the carbon black ash residue inside it. (Luo et al., 2010). Semi-batch reactors are used mainly in small-scale industries; they require pretty much space, and setup has a lot of consideration. Special equipment and a monitoring system are needed to control the unit. (López et al., 2011).

By addressing these research objectives, this study aims to contribute to developing sustainable solutions for plastic waste management while advancing the utilisation of waste-derived fuels as a renewable energy source.

Pyrolysis is a key technology in the transition to a circular economy, as it enables the recycling of waste materials into valuable products, reduces environmental impact, and promotes sustainability. Innovations in pyrolysis technology are making it more efficient, scalable, and cost-effective. As global demand for recycled materials and renewable energy sources continues to rise, pyrolysis will likely play a central role in waste management and resource recovery.

Considering the urgent need to address the plastic waste crisis, research into alternative waste management approaches has gained increasing attention from policymakers, industries, and academia.

The study aims to investigate the feasibility and potential benefits of converting waste plastics into fuel energy through pyrolysis according to circular economy principles. By examining the pyrolysis process's technical, environmental, and economic aspects, this study seeks to evaluate its effectiveness as a waste management strategy and energy recovery technology. Specifically, the research aims to:
- explore plastic waste pyrolysis within the context of a circular economy to evaluate its potential as a sustainable, resource-efficient technology for managing plastic waste and promoting the recovery of valuable materials;
- evaluate the environmental impact of waste plastic pyrolysis, including energy consumption, greenhouse gas emissions, and waste reduction potential.

By addressing these research objectives, this study aims to contribute to the development of sustainable solutions for plastic waste management while advancing the utilisation of waste-derived fuels as a renewable energy source.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

3. Methodology of Research

The heat transfer is significant in the reactor for better breaking down of the plastics and for the height yield of the plastic oil from the plastic vapour forming inside the reactor. The heating of the reactor can be done in multiple ways (Fig. 2). The heating of the burner can be given through a burner where we can use gases like LPG, CNG, biogases, and sometimes solid fuels like wood and coal are also being used mostly in the fixed bed reactors. The reactor can also be made for electricity as a heating medium using windings created around it, and the electricity is passed to heat it. Sometimes, solar energy can also be used to heat. The main disadvantage of this type of reactor using electricity as a medium is that it won't get the efficiency to produce enough temperature supply for producing gases from plastics. The microwave reactor is also used sometimes, but not very commonly, to produce it. Its main disadvantages are longer heating times, loss of energy, and the need for unique materials to create the special reactor. These classifications can be further broken down (see Figure 2).

A condenser is a device where steam condenses, and the latent heat of evaporation released by the steam is absorbed by cooling water. (Kapooria et al., 2008). The main parameters that determine the operating mode of the condenser are cooling water flow rate, cooling water temperature, heat exchange area, and steam flow into the condenser (Vodeniktov et al., 2021).

First, based on the number of Passes, that is, Single pass - As the name suggests, a one-pass condenser system only allows the fluids to pass through one another once. This setup is perfect for uses with abundant cooling water, such as cooling marine engines and Multipass systems - the fluids pass through each other more than once using U tubes or baffles. A multi-pass condenser enhances the contact duration between the steam and the cooling medium (often water or air) by using numerous passes for the steam, improving heat transfer efficiency. Cross-flow condensers -fluids flow perpendicular to each other. Cooling water flows through the tubes, and steam flows around these tubes at an angle of 90° (Kapooria et al., 2008). The fluid flowing inside the tubes is called the tube side fluid, and the fluid flowing outside the tubes is the shell side fluid. The hot and cold fluids alternate between each of the plates. It is known for high heat exchange efficiency (Wang et al. 2024).

The whole process has been mentioned and how the pollutants can be captured and used in multiple ways as because it's already the process in waste management. Also, the whole process can be maintained by very little CO2 emission, which can be nearly zero. Multiple steps need to be taken to attain zero carbon emissions. The carbon emissions and other unwanted emissions can be monitored by using multiple techniques, and equipment can be used. In this modern technical world, everything can be monitored clearly without errors. The project's main goal is to reduce emissions and recover energy from plastic waste products. Based on the multiple end products from this process, they are monitored for treatment.

Sustainability in the process of converting waste plastics The waste plastics are converted into alternative carbon-rich fuels for substitution for heating and producing electricity purposes in multiple ways. It can directly replace heavy combustion diesel engines, where a large amount of liquid fuel is combusted using air. On the other hand, this whole production process starts from collecting the waste plastics to delivering the final products connected in terms of sustainability.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

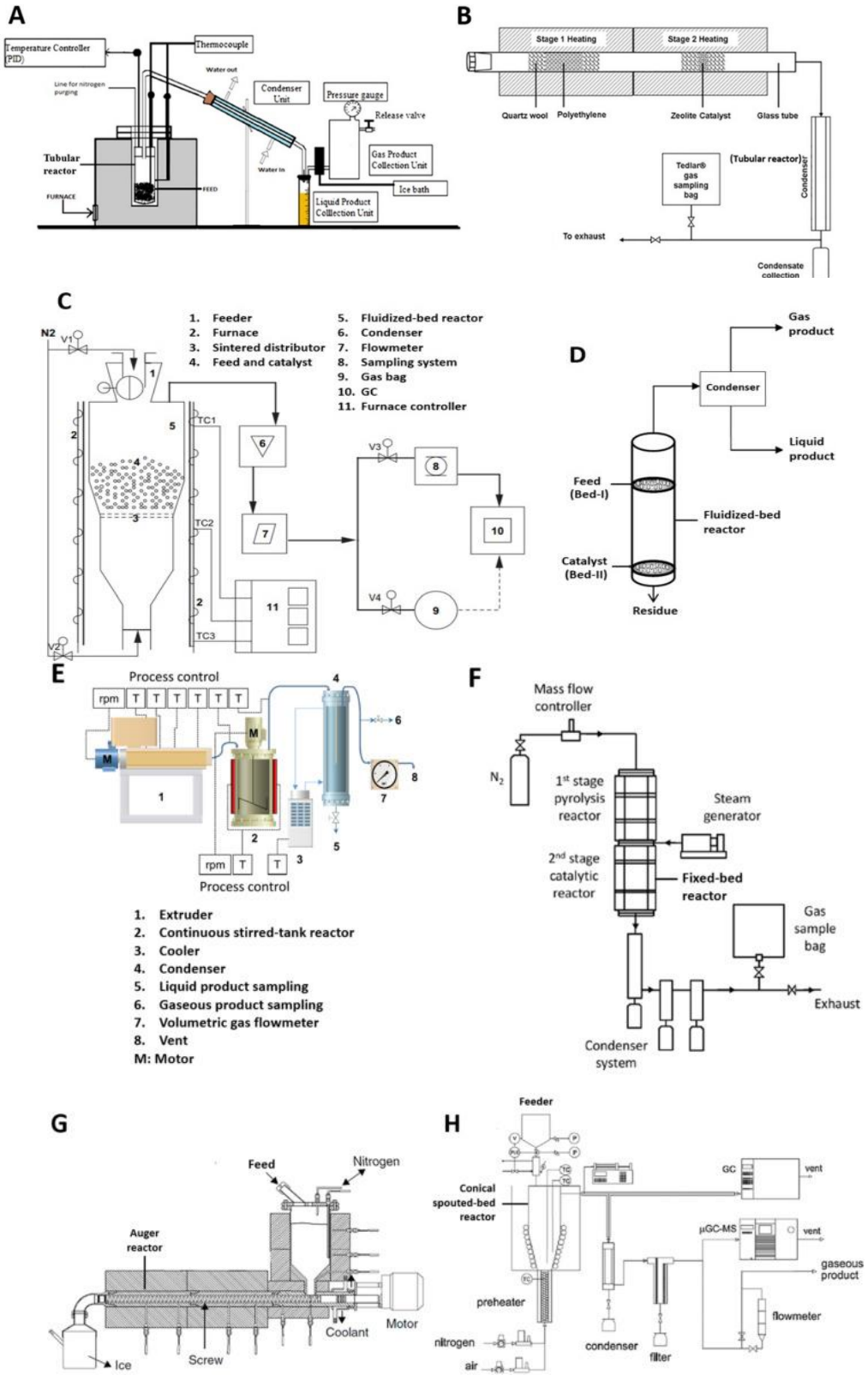


Figure 2. Types of heating based on the reactor type. A) One-stage tubular reactor, (B) two-stage tubular reactor, (C) one-stage fluidised-bed reactor, (D) two-stage fluidised-bed reactor, (E) one-stage continuous stirred-tank reactor, (F) two-stage fixed-bed reactor, (G) one-stage auger reactor and (H) one-stage conical spouted-bed reactor
Source: Chang (2023)

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

4. Experimental Results and Discussion

The fixed bed reactor is utilised in experimental settings to produce pyro-oil from various plastics (Vilas et al., 2023). For the construction of the reactor, stainless steel 1.4044 hot rolled pipes are employed due to their superior heat retention properties during heating processes. Additionally, a cyclone reactor is incorporated into the system to separate heavier pyro-gas particles from lighter ones. This separation is crucial for producing fuel without wax, although the extracted wax can serve other lubricating purposes.

Figure 3 is from the exact size of the reactor, which is planned to be used for the real-time experiment. The pictures above clearly state that it can be used for experimental purposes without any problems.

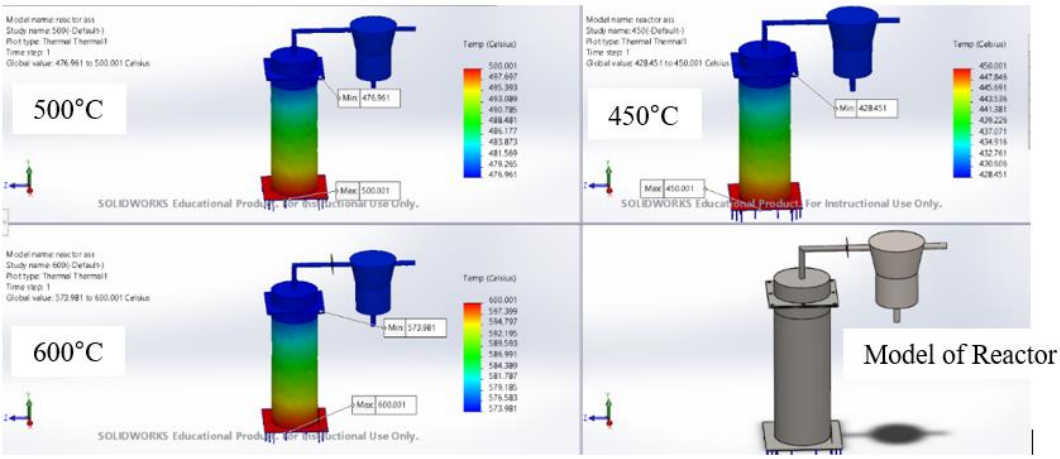


Figure 3. shows the model and simulation of the fixed bed reactors at three different temperatures of 450°C, 500°C and 600°C.
Source: own processing

Condenser design Figure 4 shows the flow control system used in the parallel flow regime where hot steam flows in the inner pipe while the cooling fluid flows on the annular side (Novarini et al., 2018). Tube and coil condenser system is a commonly used hybrid design that requires less space but still has a large heat transfer surface.

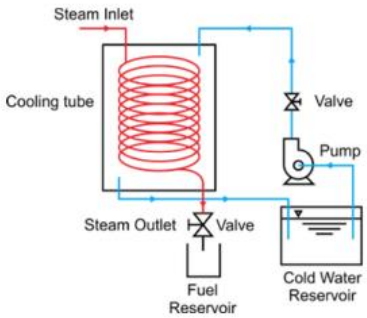


Figure 4. Condenser system design
Source: Novarini et al. (2020)

The plastics are being sorted based on the characteristics and the applications. After the segregation, the plastics are shredded into 5-10mm sizes for volume. The plastics shrink nearly 40% of their volume when heated inside the reactor. The vapour gets produced by heating the plastics in an oxygen-free environment. The burner device is connected to the gas controller to monitor the supply of the LPG, which was used as the heating medium for producing heat. The reactor is connected with copper tubes to transfer the gas from the reactor to the cyclone

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

rector, where the gas and impurities get separated based on the use of gravity and the mass of the particles. Based on this, the calculation determines the heat required to produce the pyro-vapour from the plastics. The plastic feed supplied is 5 Kg. Polypropylene (PP) was chosen for the experiment. The characteristics of plastic are shown in Table 1.

Table 1. Characteristics of Polypropylene (PP) and Polyethylene (PE)

Characteristics	Polyethylene (PE)	Polypropylene (PP)
Specific Heat of solid PE	2.2 kJ/kg-K	2.2 kJ/kg-K
Melting Point of PE	125°C	165°C
Latent heat of fusion of PE	500 kJ/kg	800 kJ/kg
Specific Heat of liquid PE	2.78 kJ/kg	2.79 kJ/kg
Cleavage temperature of PE	350°C	350°C
Activation energy for PE	280 MJ/kmol	135 MJ/kmol
Molecular weight of PE	90000 kg/kmol	220000 kg/kmol

Source: Vilas et al. (2023)

According calculations, provided by Vilas et al. (2023) there is a needed energy amound:

Assuming that 50% plastic feed is polypropylene i.e. mass of PP = 2.5 kg. Therefore, Heat energy required by PP = 1602.7636 × 2.5 = 4006.909 kJ. Heat energy required by PP = 4006.909 kJ.

Assuming that 50%plastic feed is polyethylene i.e., mass of PE = 2.5 kg Therefore, Heat energy required by PE = 1326.61 × 2.5 =3316.5 kJ. Heat energy required by PE = 3316.5 kJ

Table 2. Heat exchange calculations

Properties	Inner pipe	Annulus
Inlet temperature (T_{in})	300°c	30 °C
Outlet temperature (T_{out})	35 °c	20 °C
Mass Flow	0.01 kg/s	0.38kg/s

Source: own processing

As per the calculation above (Table 2), it's used for theoretical reference only.

So, the heat required for this will be somewhere near this. Also, the heat loss needs to be calculated. Through careful theoretical calculations, the experimental work is prepared for setup. The flow of the vapour from the reactor needs to be maintained by the proper constant heat supplied for the reactor.

For the lab experians the reactor is created from the 0.5mm of stainless steel used for ventilation. The total length of the pipe is 250mm. The diameter of the pipe is 120mm. The cover used for the reactor is also made from stainless steel, but a plate of 3mm carbon steel with bolt holes connects the reactor and the reactor cover. A 6mm base plate is welded in the bottom to withhold the heat from the torch. The total heat is supplied through propane gas with high heating energy. The reactor is connected to a stand to make the height from the floor. The torch is kept from the bottom to heat the reactor. The reactor is kept in an outdoor safe environment to prevent any damage caused by the reactor.

The steel shell of the condenser is 400 mm in height and 150 mm in diameter. The tube is made of copper tubing with a 0.5-inch diameter that has been spirally wound to a 1000 mm length. The product exits the condenser as liquid tar. The condenser's cold fluid is stored to cool and eventually be used again. The cooling fluid is maintained at a constant temperature between 15 and 20 degrees Celsius, while the condenser's intake temperature is 300 degrees Celsius.

The decarbonisation potential of converting plastic waste into synthetic fuels offers a unique opportunity to address two critical environmental challenges: plastic waste pollution and fossil fuel dependence. By

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

transforming waste plastics into valuable fuels, it can help reduce carbon emissions while offering a sustainable pathway for plastic recycling. Plastic waste contributes significantly to pollution, with millions of tons entering landfills and oceans each year. Converting plastic waste into synthetic fuels can help mitigate plastic's environmental impact while reducing CO_2 emissions associated with plastic disposal.

A study by Geyer et al. (2020) reported that around 8 million tons of plastic enter the oceans annually, causing severe environmental damage, which can be reduced through plastic recycling technologies such as pyrolysis (Geyer et al., 2020). The carbon footprint of plastic waste treatment can be reduced by up to 30% through conversion to synthetic fuels compared to landfilling or incineration. Liu et al. (2019) found that using pyrolysis for plastic waste conversion could reduce CO_2 emissions significantly by avoiding open burning or landfilling (Liu et al., 2019). By converting plastic waste into synthetic fuels, this technology could displace some of the need for fossil fuels, reducing the carbon emissions associated with fossil fuel extraction, refining, and consumption. Müller et al. (2021) estimated that converting 1 ton of plastic waste into synthetic fuels could displace up to 2.3 tons of CO_2 emissions typically produced by extracting and refining crude oil (Müller et al., 2021). 2023 lifecycle analysis by Sundaram et al. revealed that synthetic fuels from plastic waste, mainly when produced using renewable energy, could result in 30-50% lower carbon emissions compared to conventional fossil fuels (Sundaram et al., 2023).

Although converting plastic waste into synthetic fuels helps reduce plastic waste and displaces fossil fuels, the conversion processes still produce emissions, mainly depending on the energy source used for conversion. Singh et al. (2022) reported that pyrolysis, one of the primary conversion methods for plastic waste, produces a carbon intensity of about 500-700 g CO_2 per kWh. This is lower than fossil fuel-based energy but still generates emissions that must be addressed through technological advancements (Singh et al., 2022).

The conversion of plastic waste into synthetic fuels fits into a circular economy model where waste is continuously recycled and reused, reducing the need for new raw materials and minimising emissions. Kumar and Gupta (2023) explored how a circular plastic-to-fuel model could help recycle plastic waste back into usable energy, thus reducing the need for petroleum extraction and reducing emissions in the process (Kumar & Gupta, 2023). Wang et al. (2022) highlighted that plastic waste often contains mixed plastics and contaminants, which can reduce the quality and yield of the synthetic fuels produced, leading to increased emissions in some cases (Wang et al., 2022). Economic, technical, and infrastructural barriers still limit the widespread adoption of plastic-to-fuel technologies.

Conclusions

Adopting a circular economy for managing and recycling plastic waste is a crucial step toward mitigating plastic pollution's environmental, social, and economic impacts. Unlike the traditional linear economy that emphasises consumption and disposal, the circular model prioritises resource efficiency, waste minimisation, and material recovery. Through innovative recycling technologies, material design, and policy frameworks, the circular economy offers sustainable solutions for closing the loop on plastic waste.

The idea would be to capture and reuse the CO2 emitted during pyrolysis as a feedstock for other reactions (e.g., to produce chemicals or fuels), creating a closed-loop system. This could allow for a more sustainable approach, minimising or neutralising carbon emissions, contributing to a circular carbon economy.

Pyrolysis is emerging as a promising technology in the circular economy for managing plastic waste, with ongoing research focused on improving the process and expanding its industrial application. By converting plastic waste into valuable products like fuels and chemicals, pyrolysis can significantly reduce plastic waste and promote sustainability. However, challenges remain, including the need for economic feasibility and addressing the environmental impact of the process, which are the subject of ongoing research efforts.

Transitioning to a circular economy for plastic waste is challenging, including high costs, technical limitations, and a lack of consumer awareness. However, by fostering collaboration between governments, industries, and consumers and leveraging technological and policy advances, societies can build a more sustainable and

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

resource-efficient future. This shift is essential to addressing the global plastic waste crisis and creating a regenerative economy that benefits both people and the planet.

Scientific Novelty and Practical Value of the Findings

The scientific novelty of converting plastic waste to pyrolysis oil with minimal decarbonisation lies in improving the efficiency of the process while reducing emissions, integrating carbon capture, and using cleaner energy sources. Innovations in catalyst design, reactor technology, carbon capture, and process control could transform the waste-to-energy industry into a much more sustainable and carbon-neutral process. A novel reactor design could incorporate heat recovery systems or alternative fuels (like biochar) to power the pyrolysis process. This could drastically reduce the need for fossil fuel-based energy inputs, lowering the carbon emissions associated with plastic-to-oil conversion. A novel preprocessing technique could involve cleaning and sorting plastic waste to reduce these impurities, improving the efficiency of the pyrolysis process and reducing toxic emissions. This would enhance the quality of pyrolysis oil and lower the environmental impact.

The practice value of converting plastic to pyrolysis oil with low decarbonisation is significant, both environmentally and economically. Still, careful attention to energy sources, technological improvements, and waste management practices is required to minimise the carbon footprint. As decarbonisation technologies evolve and renewable energy integration becomes more common, the process can become increasingly sustainable and profitable.

References

Aisien, F. A., & Aisien, E. T. (2023). Production and characterisation of liquid oil from the pyrolysis of waste high-density polyethylene plastics using spent fluid catalytic cracking catalyst. *Sustainable Chemistry for Climate Action*, 2, 100020. https://doi.org/10.1016/j.scca.2023.100020

Bocken, N.M.P., de Pauw, I., Bakker, E., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. *Journal of Industrial and Production Engineering*, 33(5), 308-320. https://doi.org/10.1080/21681015.2016.1172124

Chang, S. H. (2023). Plastic waste as pyrolysis feedstock for plastic oil production: A review. *Science of The Total Environment*, 877, 162719. https://doi.org/10.1016/j.scitotenv.2023.162719

Chow, C.-F., Lam, C.-S., Lau, K.-C., & Gong, C.-B. (2021). Waste-to-Energy: Production of Fuel Gases from Plastic Wastes. *Polymers*, *13*(21), Article 21. https://doi.org/10.3390/polym13213672

Ead, H., Rezk, M., Piccinetti, L., Santoro, D., Elbadry, A., & Sakr, M. (2023). Integrating entrepreneurship into chemistry education - Cairo University post-graduate students' case study. *Insights into Regional Development*, 5(2), 72-82. https://doi.org/10.9770/ird.2023.5.2(5)

Evode, N., Qamar, S. A., Bilal, M., Barceló, D., & Iqbal, H. M. N. (2021). Plastic waste and its management strategies for environmental sustainability. *Case Studies in Chemical and Environmental Engineering*, 4, 100142. https://doi.org/10.1016/j.cscee.2021.100142

European Union's Circular Economy Action Plan (2019).

Fahim, I., Mohsen, O., & ElKayaly, D. (2021). Production of Fuel from Plastic Waste: A Feasible Business. *Polymer*, 13(6), Article Number 915 https://doi.org/10.3390/polym13060915

Galaly, A. R., & Dawood, N. (2023). Energy Recovery and Economic Evaluation for Industrial Fuel from Plastic Waste. *Polymers*, 15(11), 2433. https://doi.org/10.3390/polym15112433

Geyer, R., Jambeck, J. R., & Law, K. L. (2020). Production, use, and fate of all plastics ever made. *Science Advances*, 6(12), eaax5273. https://doi.org/10.1126/sciadv.1700782

Kabeyi, M. J. B., & Olanrewaju, O. A. (2023). Review and Design Overview of Plastic Waste-to-Pyrolysis Oil Conversion with Implications on the Energy Transition. *Journal of Energy*, e1821129. https://doi.org/10.1155/2023/1821129

Kafle, S., Gaire, P., & Tuladhar, N. (2023). Production of fuels by pyrolysis of waste plastics: Technical notes. *IOP Conference Series: Materials Science and Engineering*, 1279, 012008. https://doi.org/10.1088/1757-899X/1279/1/012008

Khandelwal, H., Dhar, H., Thalla, A. K., & Kumar, S. (2019) Application of life cycle assessment in municipal solid waste management: a worldwide critical review. *Journal of Cleaner Production*, 209 (2019), 630-654. https://doi.org/10.1016/j.jclepro.2018.10.233

Kumar, S., & Gupta, V. (2023). Circular plastic-to-fuel models and their decarbonisation impact. *Journal of Cleaner Production*, 296, 126491. https://doi.org/10.1016/j.jclepro.2021.126491

Liu, G., Zhang, J., & Zhang, H. (2019). Environmental and economic impacts of pyrolysis of plastic waste into synthetic fuels: A review. *Waste Management*, 87, 205-217. https://doi.org/10.1016/j.wasman.2019.02.027

López, A., de Marco, I., Caballero, B. M., Laresgoiti, M. F., & Adrados, A. (2011). Influence of time and temperature on pyrolysis of plastic wastes in a semi-batch reactor. *Chemical Engineering Journal*, 173(1), 62-71. https://doi.org/10.1016/j.cej.2011.07.037

Luo, S., Xiao, B., Hu, Z., & Liu, S. (2010). Effect of particle size on pyrolysis of single-component municipal solid waste in fixed bed reactor. *International Journal of Hydrogen Energy*, 35(1), 93-97. https://doi.org/10.1016/j.ijhydene.2009.10.048

Müller, J., Albrecht, F., & Tiedje, N. (2021). Feasibility of converting plastic waste to synthetic fuels. *Energy Conversion and Management*, 243, 114309. https://doi.org/10.1016/j.enconman.2021.114309

Moroliya, D. M. R., Borkar, M. S., Thaware, M. K., Nandanwar, M. A., & Chandel, M. S. (2023). Design & Fabrication of Extract Bio-Diesel from Waste Plastic Material. *Journal of Energy Engineering and Thermodynamics (JEET)*, 3(04), Article 04. https://doi.org/10.55529/jeet.34.22.27

Nguyen, R. K. G., Tuan Anh (Ed.). (2022). *Energy from Waste: Production and Storage*. CRC Press. https://doi.org/10.1201/9781003178354

Novarini, N., Kurniawa, S., Rusdianasari, R., Bow, Y., & Rifa, A. I. 2020. Conderser Design on Plastic Oil Distillation Equipment. 2020: Proceeding ISETH (International Summit on Science, Technology, and Humanity) / International Conference on Community Empowerment and Engagement (ICCEE) e-ISSN 2615-1588 https://proceedings.ums.ac.id/iseth/article/view/1285

Pandey, U., Stormyr, J. A., Hassani, A., Jaiswal, R., Haugen, H. H., & Moldestad, B. M. E. (2020). Pyrolysis of plastic waste to environmentally friendly products. *WIT Transactions on Ecology and the Environment*, 246, 61-74. https://doi.org/10.2495/EPM200071

Pannucharoenwong, N., Duanguppama, K., Echaroj, S., Turakarn, C., Chaiphet, K., & Rattanadecho, P. (2023). Improving fuel quality from plastic bag waste pyrolysis by controlling condensation temperature. *Energy Reports*, 9, 125-138. https://doi.org/10.1016/j.egyr.2023.05.231

Pharande, V. A., & Bagwan, S. Sh. (2023). A Review Conversation of Waste Plastics into Fuel. *Indian Scientific Journal Of Research In Engineering And Management*, 07(04). https://doi.org/10.55041/ijsrem18705

Singh, R., Garg, S., & Sharma, P. (2022). Pyrolysis of plastic waste for synthetic fuel production: Current status and future perspectives. *Renewable and Sustainable Energy Reviews*, 155, 111819. https://doi.org/10.1016/j.rser.2021.111819

Tvaronavičienė, M. (2024). The Transition towards Renewable Energy: The Challenge of Sustainable Resource Management for a Circular Economy. *Energies*, 17, 4242. https://doi.org/10.3390/en17174242

Vodeniktov, A., Chichirova, N., & Melnikova, V. (2021). Experimental Assessment of the Condenser at Off-Design Modes. *Case Studies in Thermal Engineering*, 28, 101457. https://doi.org/10.1016/j.csite.2021.101457

Wang, D., Wu, Q., Wang, G., Zhang, H., & Yuan, H. (2024). Experimental and Numerical Study of Plate Heat Exchanger Based on Topology Optimization. *International Journal of Thermal Sciences*, 195, 108659. https://doi.org/10.1016/j.ijthermalsci.2023.108659

Wang, F., Zhao, X., & Yang, H. (2022). Impact of feedstock contamination on plastic-to-fuel efficiency. *Waste Management & Research*, 40(7), 757-764. https://doi.org/10.1177/0734242X221086529

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/m5297249738

Author Contributions: Conceptualisation: K. Baziene, S. Rajendran; methodology: K. Baziene, J. N. Solomon; data analysis: J. Gargasas, J. N. Solomon; writing—original draft preparation: K. Baziene, J. Gargasas, S. Rajendran; writing; review and editing: K. Baziene; visualisation: J. Gargasas, S. Rajendran. All authors have read and agreed to the published version of the manuscript.

Kristina BAZIENE is the Associate Professor at Vilnius Gediminas Technical University, Faculty of Mechanics, Department of Mechanical and Materials Engineering.
ORCID ID: https://orcid.org/0000-0002-1758-8424

Justinas GARGASAS is the Associate Professor at Vilnius Gediminas Technical University, Faculty of Mechanics, Department of Mechanical and Materials Engineering.
ORCID ID: https://orcid.org/0000-0001-7044-7746

Surya RAJENDRAN is an early-stage researcher at Vilnius Gediminas Technical University, Faculty of Mechanics, Department of Mechanical and Materials Engineering.
ORCID ID: https://orcid.org/0009-0009-7303-7334

Jordan Nathan SOLOMON is an early-stage researcher at at Vilnius Gediminas Technical University, Faculty of Mechanics, Department of Mechanical and Materials Engineering.
ORCID ID: https://orcid.org/0009-0003-7900-0598

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

Publisher
http://jssidoi.org/esc/home

IMPACT OF HUMAN RESOURCE MANAGEMENT ORGANIZATIONS' PERFORMANCE: EMPIRICAL EVIDENCE FROM SMALL AND MEDIUM-SIZED ENTERPRISES IN THE SLOVAK REPUBLIC*

Samuel Body [1], Lukrécia Hunková [2], Katarína Haviernikova [3]

[1,2,3] Alexander Dubček University of Trenčín, Študentská 3, 911 50 Trenčín, Slovakia

E-mails:[1] samuel.body@tnuni.sk (Corresponding author); [2] lukrecia.hunkova@tnuni.sk ; [3] katarina.haviernikova@tnuni.sk

Received 15 September 2024; accepted 10 December 2024; published 30 December 2024

Abstract. Effective human resource management is currently acknowledged as a crucial factor in supporting the performance and sustainability of organisations. The evidence base in this area is growing, and there is a growing consensus that effective human resource management is a key driver of organisational success. This gap is particularly evident in the context of SMEs, where effective HRM systems can be vital for long-term success. This study addresses the aforementioned research gap by identifying the relationship between high-performance work systems (HPWS) and innovation performance (IP), as well as between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs). The data were obtained from small and medium-sized enterprises (SMEs) operating in the Slovak Republic and subsequently analysed using Kendall's Tau-b. The results demonstrated a statistically significant moderate positive correlation between the examined variables, indicating that high-performance work systems (HPWS) and human resource management practices (HRMP) have a positive impact on the innovation performance of SMEs. In light of the findings presented here, we propose that further research be conducted to examine the long-term effects and optimisation of coherent HRM systems across various organisational types. Further research should investigate how these systems can foster employee engagement, reinforce an innovation culture, and enhance the company's overall performance over an extended period.

Keywords: high-performance work systems; human resource management practices; innovation performance; SMEs; Kendall's Tau-b

Reference to this paper should be made as follows: Body, S., Hunková, L., Haviernikova, K. 2024. Impact of human resource management organisations' performance: empirical evidence from small and medium-sized enterprises in the Slovak Republic. *Entrepreneurship and Sustainability Issues*, 12(2), 473-483. http://doi.org/10.9770/q2282422868

JEL Classifications: M12, O15, O31

1. Introduction

The effective management of human resources (HRM) is currently regarded as one of the key factors determining the success of organisations. In an evolving business environment shaped by globalisation, technological advancements and demographic shifts, the effective configuration of HRM is crucial for maintaining competitiveness and achieving long-term and sustainable organisational objectives. To succeed in a highly competitive market, SMEs must adopt innovative approaches. The concept of sustainable business, as it pertains to small and medium-sized enterprises (SMEs), encompasses not only the achievement of economic outcomes but also the consideration of other factors, including social responsibility, environmental impact, and the ability to keep pace with trends in digitalisation. This necessitates the implementation of strategic human

* *This research was funded by the Slovak Ministry of Education's Scientific grant agency VEGA 1/0718/22 Human resources development in small and medium-sized enterprises in the context of the 21st century challenges*

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

resource management. These tendencies align with the principles of a sustainable economy and entrepreneurship (Mura, 2021). The harmonisation of legislation pertaining to employee rights and obligations and the promotion of innovative HRM approaches represent key priorities for the EU. This EU policy exerts a considerable influence on HRM practices in the Slovak Republic.

Furthermore, the technological advancement and intensified competition brought about by globalisation exert pressure for innovations in products and services. Effective human resource management strategies can enhance organisational productivity, competitiveness and sustainable growth. In the context of this study, it can also facilitate increased innovation performance. Furthermore, the findings of Surucu & Sesen (2019) support this argument, indicating that human resource management practices positively influence entrepreneurial behaviour. Further research indicates that effective human resource management can facilitate organisational performance and innovation (Gede Riana et al., 2020). However, inadequate investment in human resources, particularly in small and medium-sized enterprises (SMEs), may hinder their capacity to compete and innovate, representing a significant challenge for these organisations. The research highlights the significance of these consistent HRM systems, which can impact employee attitudes, particularly when they are subjectively perceived. The integration of HRM systems enhances employees' capacity to engage in creative and innovative behaviours, thereby augmenting the organisation's potential for innovation (Ogbonnaya et al., 2019). It is similarly important to recognise the role of leadership and motivational factors in achieving work performance and innovation (Hitka et al., 2019). Innovative leaders who manage and motivate employees can confer a competitive advantage upon organisations. It is also essential to observe the impact of organisational learning and the work environment on shaping employees' innovative work behaviour (Awang et al., 2019). Micro and small businesses must focus on fostering the innovative behaviour of their employees, which can improve their competitiveness and innovation capacity. In light of the aforementioned facts, it is evident that human resource management is a pivotal foundation for strategic growth, innovation performance, and sustainable business objectives for small and medium-sized enterprises (SMEs). A focus on coherent and interconnected HRM systems, coupled with effective leadership, facilitates the optimal utilisation of employee potential and enhances their capacity to contribute to creative and productive outcomes. In the context of this discussion, it is essential to examine how HRM practices can affect the innovation performance of SMEs. The objective of this study is to identify the relationship between high-performance work systems (HPWS) and innovation performance (IP), as well as between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs).

2. Theoretical background

The field of human resource management (HRM) is a critical component in enabling the innovative performance of organisations. Practices such as knowledge sharing, fostering employee engagement, utilising the AMO model (Ability, Motivation, Opportunity), and implementing high-performance work systems enable organisations to enhance their capacity for innovation. Such HRM strategies not only facilitate employee motivation and development but also contribute to creating an environment conducive to generating innovative ideas and sustainable growth. In their studies, Bos-Nehles et al. (2019) and Agung Laksono (2023) concentrate on the variables influencing knowledge sharing in organisational contexts. In a similar vein, Agung Laksono (2023) underscores the significance of organisational culture and information sharing in enhancing employee performance. Tran Pham (2023) and Batool et al. (2023) investigate the mediating function of knowledge sharing within organisational contexts. Tran Pham (2023) illustrates that knowledge sharing can act as a mediator in the relationship between organisational justice and employees' innovative behaviour, emphasising the significance of cultivating an open and fair organisational environment. Batool et al. (2023) build upon this concept, examining the mediating role of knowledge sharing, systems thinking, and organisational sustainability. They highlight the necessity of integrating diverse factors to achieve sustainable organisational development. Lastly, Khan et al. (2020) developed a model that incorporates HRM with transactive memory to understand better the dynamics of mergers and acquisitions in global organisations. This research emphasises the importance of a comprehensive view of HRM. It highlights that successful management involves not only the implementation of proper practices but also the effective utilisation of existing knowledge and experience within the organisation.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

The level of employee engagement is a significant determinant of organisational success. In the contemporary competitive business environment, employee engagement is becoming increasingly important, as satisfied and engaged employees are the key to achieving positive results and sustainable growth. It has been demonstrated that employee engagement positively impacts organisational performance, with this relationship mediated by employees' job satisfaction. The implementation of strategies that promote employee involvement and satisfaction with the work environment has been demonstrated to result in significantly favourable outcomes (Al-Dalahmeh et al., 2018). Similarly, human resource management practices have been demonstrated to influence employee engagement and organisational culture significantly. The involvement of employees in decision-making processes and the provision of opportunities for career development have been identified as key factors in promoting engagement and creating a positive organisational culture (Ma'arof et al., 2023). Integrating these strategies with sustainability and innovation is crucial to ensure long-term organisational development. Sustainable HRM practices that cultivate engagement and professional development can mitigate turnover and enhance team stability, thereby creating a favourable environment that fosters creativity and innovation. Career development and employee participation in organisational processes are crucial factors that influence their engagement and can contribute to the enhancement of the quality of services provided (Dumitriu et al., 2023). High-quality service provision, in contrast, supports organisational sustainability.

The present state of human resource management (HRM) and its influence on organisational performance and innovation can be more effectively elucidated within the framework of the Abilities–Motivation–Opportunities (AMO) model. As evidenced by studies such as that conducted by Dastmalchian et al. (2020), there is a positive correlation between HRM practices and organisational performance, which remains unaffected by societal and cultural factors. These findings are further supported by Johar et al. (2022), who identified critical factors affecting employee well-being in the ongoing pandemic, namely motivation and opportunities. Moreover, Ferrarini et al. (2023) demonstrate that HRM practices can also influence the extent of open innovation and innovativeness within organisations. The research indicates that investments in practices that enhance abilities, motivation, and opportunities increase the probability of organisational innovation and facilitate collaboration with external partners. Zhang et al. (2020) highlight the causal relationship between specific HRM practices and employee well-being. These findings provide valuable insight into how HRM practices, in terms of the AMO model, can impact organisational performance and innovation by enhancing employees' abilities, motivation, and opportunities. It is crucial to assess the effectiveness and adaptability of these practices in response to changing conditions to achieve organisational performance goals and improve employee satisfaction.

The present state of green human resource management (Green HRM) and its relationship with environmental sustainability and organisational performance represent a significant field of investigation. Imran et al. (2021) emphasise the pivotal role of technological advancement and big data in driving green innovations and economically sustainable organisational performance. The study indicates that implementing a technological model for data interpretation would markedly enhance decision-making processes, accompanied by a requisite shift in employee competencies. Aboramadan et al. (2021) and Aboramadan et al. (2022) highlight the positive impact of Green HRM on job performance and work-related outcomes. Their research highlights the necessity of integrating socially responsible approaches into HRM to achieve economic and environmental sustainability within organisations. Palupiningtyas (2024) investigates the relationship between implementing Green HRM practices, employee engagement and organisational performance in environmental sustainability. The findings indicate that Green HRM positively influences employee engagement, which subsequently contributes to overall improvements in organisational performance. The objective of the study conducted by Sharma et al. (2022) was to examine the fundamental impact of sustainable HRM practices on adopting technologies implemented in Industry 4.0 on employee skills. The study focused on four practices (employee participation, flexibility, training, and empowerment within the organisation). The results demonstrate that all four practices positively impact employee skills, increasing their work efficiency and ultimately improving organisational performance.

In a competitive market environment, performance metrics assume a significant role. In order to enhance efficiency and productivity, HRM approaches such as high-performance work systems (HPWS) are strategically employed. Hermans et al. (2021) observed that a persistent challenge exists whereby the influence of HR departments within organisational processes is frequently underestimated. This is despite evidence indicating the positive impact of HRM on organisational performance. This approach may prove challenging for HR

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

professionals seeking to implement HPWS. White et al. (2021) adopt a configurational approach to investigate the influence of the hybrid environment on managerial practices and their subsequent impact on organisational performance. The study revealed that while there is a notable resemblance in managerial practices between high- and low-performing organisations, the presence of effective managerial practices is a crucial determinant of high performance, yet their absence does not necessarily indicate low performance. The relationship between high-performance work systems (HPWS) and an organisation's innovation performance indicates that effective human resource management (HRM) practices can enhance productivity and cultivate innovation potential through the systematic advancement of employee capabilities, motivation, and prospects. These practices should be regarded as a fundamental pillar supporting an innovation-oriented organisational culture, enabling the achievement of sustainable competitive advantage and the capacity to adapt to market changes. The findings of Rasool et al. (2019) indicate that HRM practices directly impact innovativeness and indirectly affect the organisation's sustainable performance through organisational innovations. This study demonstrates the necessity for a strategic and sustainable approach to HRM practices that supports innovation processes and fosters long-term growth and sustainable organisational performance.

While research often focuses on the relationships between individual HRM practices and organisational performance indicators, there is a lack of a comprehensive approach that examines the effect of an integrated system of HRM practices on an organisation's innovation performance. In light of the aforementioned shortcomings, there is a pressing need to focus on examining coherent HRM practices. This study will examine high-performance work systems in relation to innovation performance and a comprehensive set of proven HRM practices that includes knowledge sharing, learning and selected elements of the AMO model. The research gap allows for exploring the impact of two separate coherent HRM approaches on an organisation's innovation potential and their contribution to enhancing overall organisational performance.

3. Research objective and methodology

The objective of this study is to identify the relationship between high-performance work systems (HPWS) and innovation performance (IP), as well as between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs). Based on the aforementioned research gap, the following research questions have been formulated:

- RQ1: What is the relationship between high-performance work systems (HPWS) and innovation performance (IP) in small and medium-sized enterprises (SMEs)?
- RQ2: What is the relationship between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs)?

The data were gathered from small and medium-sized enterprises (SMEs) in Slovakia, operating across a range of industrial sectors. A total of 128 respondents participated in the study. The respondents indicated their level of agreement with the individual statements on a 5-point Likert scale, where 1 represented total disagreement and 5 represented total agreement. The categories 1 and 2 were merged into one category, while categories 4 and 5 were merged into a second category. This resulted in the formation of new response categories with values of 1 (indicating disagreement), 3 (indicating neutrality) and 5 (indicating agreement), which facilitated more efficient processing and interpretation of the data. The variables examined in this study were as follows:

- Innovation performance (IP), ordinal variable,
- High Performance Work Systems (HPWS), ordinal variable,
- Human resource management practices (HRMP), ordinal variable.

To facilitate the interpretation of the data and to determine the strength of the relationship between the variables under investigation, the individual responses from respondents were averaged across the relevant categories, resulting in an aggregated result for each respondent. The data were subjected to analysis using Kendall's Tau-b in SPSS Statistics. Given that the variables were ordinal and the number of categories was limited, the cross-tabulation method with Kendall's tau-b coefficient was employed. The Kendall's Tau coefficient was used to examine the correlation, given that the variables utilised in this study were non-parametric (Betáková et al.,

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

2021). To undertake the analysis, each variable was subjected to normality testing using the Kolmogorov-Smirnov test, with a sample size of n > 50. To ascertain the normal distribution of the data, the following hypotheses were posited:

- The null hypothesis (H0): Data are normally distributed.
- Alternative hypothesis (H1): Data are not normally distributed.

Table 1. Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
IP	,289	128	,000	,768	128	,000
HPWS	,406	128	,000	,654	128	,000
HRMP	,275	128	,000	,779	128	,000

Source: own processing

The Kolmogorov-Smirnov test indicates that the p-value in each observation is less than the significance level $\alpha = 0.05$, thereby confirming the rejection of the null hypothesis (H_0) and the acceptance of the alternative hypothesis (H_1). This result corroborates the conclusion that the data are not normally distributed.

4. Results and discussion

This section presents the results of an analysis investigating the relationship between high-performance work systems (HPWS) and innovation performance (IP) and between human resource management practices (HRMP) and innovation performance (IP) within the context of small and medium-sized enterprises (SMEs).

Table 2. Case Processing Summary (HPWS – IP)

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
HPWS * IP	128	100,0%	0	0,0%	128	100,0%

Source: own processing

The table above provides an overview of case processing in the HPWS-IP relationship, based on a total sample of 128 cases. The proportion of valid cases represents 100% of the total, ensuring that the analysis was performed on the entire sample, thus avoiding any data loss.

ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES
ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

Table 3. Crosstabulation (HPWS and IP)

			IP			Total
			1	3	5	
HPWS	1	Count	7	5	1	13
		Expected Count	3,4	3,8	5,9	13,0
		Adjusted Residual	2,4	,8	-2,9	
	3	Count	9	12	9	30
		Expected Count	7,7	8,7	13,6	30,0
		Adjusted Residual	,6	1,5	-1,9	
	5	Count	17	20	48	85
		Expected Count	21,9	24,6	38,5	85,0
		Adjusted Residual	-2,1	-1,9	3,6	
Total		Count	33	37	58	128
		Expected Count	33,0	37,0	58,0	128,0

Source: own processing

Table 3 presents the results of the respondents' answers, which have been processed in the form of a contingency table. A total of 48 respondents indicated that the increase in innovation performance was accompanied by the current high-performance work systems setup. Conversely, 7 respondents did not identify an increase in innovation performance in the context of current high-performance work systems settings.

Table 4. Symmetric Measures (HPWS and IP)

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	,297	,074	3,848	,000
N of Valid Cases		128			

Source: own processing

The following hypotheses are proposed in relation to Kendall's Tau-b:

- Null hypothesis (H0): There is no statistically significant positive relationship between HPWS and IP.
- Alternative hypothesis (H1): There is a statistically significant positive relationship between HPWS and IP.

Kendall's tau-b has a value of 0.297, indicating a moderate positive correlation between the two variables. The results demonstrate that an increase in HPWS values is associated with a tendency for IP to increase. A p-value of less than 0.05 indicates that the observed correlation is statistically significant at the 0.05 level of significance. Based on the aforementioned evidence, it can be concluded that the null hypothesis (H0) is rejected, and therefore, the alternative hypothesis (H1) is accepted. The results demonstrate a statistically significant relationship between high-performance work systems (HPWS) and innovation performance (IP) within the small and medium enterprises (SMEs) analysed.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

Table 5. Case Processing Summary (HRMP and IP)

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
HRMP * IP	128	100,0%	0	0,0%	128	100,0%

Source: own processing

Table 5 provides an overview of case processing in the HRMP-IP relationship with a total sample of 128 cases. The proportion of valid cases represents 100% of the total, ensuring that the analysis was performed on the entire sample without data loss. The number of missing cases is zero, confirming that the data for both variables (HRMP and IP) are complete.

Table 6. Crosstabulation (HRMP and IP)

			IP			Total
			1	3	5	
HRMP	1	Count	15	12	5	32
		Expected Count	8,3	9,3	14,5	32,0
		Adjusted Residual	3,1	1,2	-3,9	
	3	Count	11	13	17	41
		Expected Count	10,6	11,9	18,6	41,0
		Adjusted Residual	,2	,5	-,6	
	5	Count	7	12	36	55
		Expected Count	14,2	15,9	24,9	55,0
		Adjusted Residual	-2,9	-1,5	4,0	
Total		Count	33	37	58	128
		Expected Count	33,0	37,0	58,0	128,0

Source: own processing

Table 6 presents the results of the respondents' answers, which have been processed in the form of a contingency table. A total of 36 respondents indicated that the growth in innovation performance was accompanied by the current human resource management practices. Conversely, 15 respondents did not identify the growth in innovation performance in the context of the current human resource management practices.

Table 6. Symmetric Measures (HRMP and IP)

		Value	Asymptotic Standardized Error[a]	Approximate T[b]	Approximate Significance
Ordinal by Ordinal	Kendall's tau-b	,369	,069	5,302	,000
N of Valid Cases		128			

Source: own processing

The following hypotheses are proposed in relation to Kendall's Tau-b:

- Null hypothesis (H0): There is no statistically significant positive relationship between HRMP and IP.
- Alternative hypothesis (H1): There is a statistically significant positive relationship between HRMP and IP.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

Kendall's tau-b value is 0.369, indicating a moderate positive correlation between the two variables. The results demonstrate that an increase in HRMP values is associated with a tendency for IP to increase. A p-value of less than 0.05 indicates that the observed correlation is statistically significant at the 0.05 level of significance. Based on the results, the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. A statistically significant relationship was found between human resource management practices (HRMP) and innovation performance (IP) within the small and medium enterprises (SMEs) analysed.

The results of the study allow us to respond to the stated research questions, RQ1 (What is the relationship between high-performance work systems (HPWS) and innovation performance (IP) in small and medium-sized enterprises (SMEs)?) and RQ2 (What is the relationship between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs) ?).

Answer to RQ1: The analysis demonstrates a statistically significant positive correlation between high-performance work systems (HPWS) on the one hand and innovation performance (IP) on the other in small and medium-sized enterprises (SMEs). The value of Kendall's tau-b is 0.297, indicative of a moderate positive correlation between the two variables under consideration. The P-value is less than 0.05, allowing us to reject the null hypothesis (H0) and accept the alternative hypothesis (H1). Therefore, we can conclude that HPWS significantly positively affects IP in the SMEs analysed.

Answer to RQ2: The results of the study demonstrate a statistically significant positive correlation between the implementation of human resource management practices (HRMP) and the innovation performance (IP) observed in small and medium-sized enterprises (SMEs). The Kendall's tau-b correlation coefficient value is 0.369, indicating a moderate positive correlation between the two variables. The p-value is less than the 0.05 significance level, allowing us to reject the null hypothesis (H0) and accept the alternative hypothesis (H1). This verifies that HRMPs have a positive effect on IP in the analysed SMEs.

The latest research findings in human resource management confirm the positive relationship between the implementation of effective human resource management practices and both aspects of organisational performance, namely financial performance and innovation performance. A substantial body of research, including studies by Yahya et al. (2024) and Alkhalaf and AI-Tabbaa (2024), indicates that individual human resource management practices, such as knowledge sharing, learning, and the application of the AMO model, play a considerable role in enhancing performance indicators. Similarly, research conducted by Sherazi et al. (2024) and Sharma et al. (2024) has demonstrated that the implementation of high-performance work systems (HPWS) has a positive impact on the innovation potential of organisations. The analysis confirmed the existence of a significant positive correlation between high-performance work systems (HPWS) and innovation performance in small and medium-sized enterprises (SMEs). These findings suggest that organisations that effectively implement HPWS tend to achieve higher innovation performance. Similarly, the research revealed that human resource management practices (HRMP) have the same positive impact on innovation performance in the SMEs analysed. A similar conclusion was reached in a study conducted by Dastmalchian and colleagues (2020), which indicates a positive correlation between high-performance work systems (HPWS) and organisational performance.

Additionally, White et al. (2021) underscore the significance of consistency and the successful implementation of management practices, which favourably impact organisational performance. Ferrarini et al. (2023) confirm the positive relationship between human resource management practices and employees' innovative behaviour in their research. This research has demonstrated that coherent HRM practices, whether in the form of high-performance work systems or as a set of coherent practices based on individual knowledge-sharing approaches, learning and elements of the AMO model, emphasise the necessity of coherent and strategic HRM. These findings suggest that organisations adopt a holistic HRM approach to maximise their innovation potential and improve overall performance.

ISSN 2345-0282 (online) http://jssidoi.org/jesi/
2024 Volume 12 Number 2 (December)
http://doi.org/10.9770/q2282422868

Conclusions

The objective of this study was to identify the relationship between high-performance work systems (HPWS) and innovation performance (IP), as well as between human resource management practices (HRMP) and innovation performance (IP) in small and medium-sized enterprises (SMEs). The methodology employed utilised tools to assess the strength of relationships between non-parametric variables, specifically Kendall's tau-b, and contingency tables to facilitate the interpretation of respondents' answers. The results demonstrated a statistically significant, moderately strong positive correlation between HPWS and IP. The contingency table indicated that the majority of respondents perceived the current HPWS to be a factor that would lead to an increase in IP. With regard to the relationship between HRMP and IP, a statistically significant, moderately strong positive correlation was identified.

Furthermore, the contingency table suggests that the majority of respondents perceive the current set of HRMP to be a factor that would support an increase in IP. The findings of this study highlight the key role of HPWS and HRMP and their beneficial effect on IP. The findings indicate that future research should adopt a strategic and coherent approach to human resource management, integrating practices designed to foster innovation and performance. It would be beneficial for future research to analyse the long-term effects and optimisation of these coherent systems on different types of organisations. The findings provide guidance for HR managers on the creation of a comprehensive human resource management system that would promote employee engagement, foster a culture of innovation, and contribute to sustained improvements in organisational performance. The integration of connected HRM practices can serve to enhance organisational competitiveness and the quality of the work environment. This study contributes to the theoretical knowledge base on the impact of coherent HRM systems on performance and innovation outcomes. The study encourages further research to examine the complex effects of strategic HRM systems in the context of organisations' sustainable development and performance goals. Our study's limited number of respondents made it impossible to use more sophisticated and precise statistical methods.

References

Aboramadan, M., & Karatepe, O.M. 2021. Green human resource management, perceived green organisational support and their effects on hotel employees' behavioral outcomes. *International Journal of Contemporary Hospitality Management*, 33(10), 3199-3222. https://doi.org/10.1108/IJCHM-12-2020-1440

Aboramadan, M., Kundi, Y.M., & Becker, A. 2022. Green human resource management in nonprofit organisations: effects on employee green behavior and the role of perceived green organisational support. *Personnel Review*, 51(7), 1788-1806. https://doi.org/10.1108/PR-02-2021-0078

Agung Laksono, A. (2023). The Impact Learning Organization and Organization Culture To Employee Performance, Mediated By Knowledge Sharing (Empirical Study On Bumitama Agri LTD.). *Aptisi Transactions on Technopreneurship (ATT)*, *5*(2), 145-156. https://doi.org/10.34306/att.v5i2.294

Al-dalahmeh, M., Masa'deh, R., Abu Khalaf, R. K., & Obeidat, B. Y. (2018). The Effect of Employee Engagement on Organizational Performance Via the Mediating Role of Job Satisfaction: The Case of IT Employees in Jordanian Banking Sector. *Modern Applied Science*, 12(6), 17. https://doi.org/10.5539/mas.v12n6p17

Alkhalaf, T., & Al-Tabbaa, O. (2024). The effect of ability, motivation and opportunity (AMO) on SMEs' innovation performance. *Creativity and Innovation Management*, 33(1), 21-38. https://doi.org/10.1111/caim.12578

Awang, A. H., Mohd Sapie, N., Hussain, M. Y., Ishak, S., & Md Yusof, R. (2019). Nurturing innovative employees: Effects of organisational learning and work environment. *Economic Research-Ekonomska Istraživanja*, 32(1), 1152-1168. https://doi.org/10.1080/1331677X.2019.1592007

Batool, F., Mohammad, J., Awang, S. R., & Ahmad, T. (2023). The effect of knowledge sharing and systems thinking on organisational sustainability: The mediating role of creativity. *Journal of Knowledge Management*, *27*(5), 1251-1278. https://doi.org/10.1108/JKM-10-2021-0785

Betáková, J., Okreglicka, M., & Havierniková, K. (2021). Entrepreneurial Orientation of Male and Female Entrepreneurs in Small Firms. *TEM Journal*, 1307-1313. https://doi.org/10.18421/TEM103-38

Bos-Nehles, Anna. C., & Veenendaal, A. A. R. (2019). Perceptions of HR practices and innovative work behavior: The moderating effect of an innovative climate. *The International Journal of Human Resource Management*, 30(18), 2661-2683. https://doi.org/10.1080/09585192.2017.1380680

Dastmalchian, A., Bacon, N., McNeil, N., Steinke, C., Blyton, P., Satish Kumar, M., Bayraktar, S., Auer-Rizzi, W., Bodla, A. A., Cotton, R., Craig, T., Ertenu, B., Habibi, M., Huang, H. J., İmer, H. P., Isa, C. R., Ismail, A., Jiang, Y., Kabasakal, H., … Varnali, R. (2020). High-performance work systems and organisational performance across societal cultures. *Journal of International Business Studies*, 51(3), 353-388. https://doi.org/10.1057/s41267-019-00295-9

Dumitriu, S., Ploscaru, A.-N., University of Craiova, Romania, & Ghita, R.-C. (2023). Evaluating the Effects of Employee Recruitment and Selection Practices on the Organizational Change Process. *Ovidius University Annals. Economic Sciences Series*, 23(1), 611-616. https://doi.org/10.61801/OUAESS.2023.1.79

Ferrarini, F., & Curzi, Y. (2023). AMO-enhancing practices, open innovation and organisations' innovation in the European context: Testing a mediation model. *European Journal of Innovation Management*, 26(6), 1697-1720. https://doi.org/10.1108/EJIM-01-2022-0005

Gede Riana, I., Suparna, G., Gusti Made Suwandana, I., Kot, S., & Rajiani, I. (2020). Human resource management in promoting innovation and organisational performance. *Problems and Perspectives in Management*, 18(1), 107-118. https://doi.org/10.21511/ppm.18(1).2020.10

Hermans, M., & Ulrich, M. D. (2021). How symbolic human resource function actions affect the implementation of high-performance work practices: The mediating effect of influence on strategic decision-making. *Human Resource Management Journal*, 31(4), 1063-1081. https://doi.org/10.1111/1748-8583.12361

Hitka, M., Kucharčíková, A., Štarchoň, P., Balážová, Ž., Lukáč, M., & Stacho, Z. (2019). Knowledge and Human Capital as Sustainable Competitive Advantage in Human Resource Management. *Sustainability*, 11(18), 4985. https://doi.org/10.3390/su11184985

Imran, R., Alraja, M.N., Khashab, B. 2021. Sustainable Performance and Green Innovation: Green Human Resources Management and Big Data as Antecedents. In: *Ieee Transactions on Engineering Management* [online]. 2021 [cit. 2023-05-20]. https://s3-us-west-2.amazonaws.com/ieeeshutpages/xplore/xplore-shut-page.html

Johar, E. R., Rosli, N., Mat Khairi, S. M., Shahruddin, S., & Mat Nor, N. (2022). COVID-19 outbreak: How do human resource management practices affect employee well-being? *Frontiers in Psychology*, 13, 923994. https://doi.org/10.3389/fpsyg.2022.923994

Khan, Z., Soundararajan, V., & Shoham, A. (2020). Global post-merger agility, transactive memory systems and human resource management practices. In: *Human Resource Management Review*, 30(1) https://doi.org/10.1016/j.hrmr.2019.100697

Ma'arof, R. A., Rashid, U. K., & Nasuredin, J. (2023). Improving Employee Engagement Through HRM Practices in Public Hospitals. *Advances in Social Sciences Research Journal*, 10(11), 24-33. https://doi.org/10.14738/assrj.1011.15816

Mura, L. (2021). Development Management of Innovation Businesses in Light of Slovak Enterprises. In Bevanda, V. (Ed.), *International Scientific Conference ERAZ – Knowledge Based Sustainable Development*, 7th International Scientific Conference – ERAZ 2021, Belgrade: Association of Economists and Managers of the Balkans, 109-117. https://doi.org/10.31410/ERAZ.2021.109

Ogbonnaya, C., & Messersmith, J. (2019). Employee performance, well-being, and differential effects of human resource management subdimensions: Mutual gains or conflicting outcomes? *Human Resource Management Journal*, 29(3), 509-526. https://doi.org/10.1111/1748-8583.12203

Palupiningtyas, D. (2024). Green HRM: Strategies for Sustainable Business Practices and Employee Engagement. *Management Studies and Business Journal (PRODUCTIVITY)*, 1(3), 386-401. https://doi.org/10.62207/dhfpj238

Rasool, S. F., Samma, M., Wang, M., Zhao, Y., & Zhang, Y. (2019). How Human Resource Management Practices Translate Into Sustainable Organisational Performance: The Mediating Role Of Product, Process And Knowledge Innovation. *Psychology Research and Behavior Management*, 12, 1009-1025. https://doi.org/10.2147/PRBM.S204662

Sharma, M., Luthra, S., Joshi, S., & Kumar, A. (2022). Analysing the impact of sustainable human resource management practices and industry 4.0 technologies adoption on employability skills. In: *International Journal of Manpower*, 43(2), 463-485. https://doi.org/10.1108/IJM-02-2021-0085

Sharma, S., Verma, S., Rani, R., & Gahlot, P. (2024). Enhancing Organisational Performance Through High-Performance Work Practices in the IT Sector: Variable Influence on Organisational Efficiency. In M. Madanchian (Ed.), *Advances in Human Resources Management and Organizational Development* (pp. 41-72). IGI Global. https://doi.org/10.4018/979-8-3693-6402-4.ch002

Sherazi, K., Zhang, P., Ghazanfar, F., & Khan, Q.-A. (2024). Why is institutional pressure insufficient to develop green innovation in manufacturing firms? The role of green high-performance work systems and managerial environmental concern. *Journal of Environmental Planning and Management*, 1-26. https://doi.org/10.1080/09640568.2023.2295225

Surucu, L., & Sesen, H. (2019). Entrepreneurial Behaviors in the Hospitality Industry: Human Resources Management Practices and Leader Member Exchange Role. *Revista de Cercetare Si Interventie Sociala*, 66, 114-132. https://doi.org/10.33788/rcis.66.8

Tran Pham, T. K. (2023). Organisation justice, knowledge sharing and employees' innovative behavior: Evidence from the knowledge-intensive industry. *Employee Relations: The International Journal*, 45(6), 1492-1510. https://doi.org/10.1108/ER-04-2022-0211

White, L., Lockett, A., Currie, G., & Hayton, J. (2021). Hybrid Context, Management Practices and Organisational Performance: A Configurational Approach. *Journal of Management Studies*, 58(3), 718-748. https://doi.org/10.1111/joms.12609

Yahya, A., . A., Rozik, T. A., & Nabil, S. A. (2024). Green and Digital Leadership: Impact on Sustainable Performance, Mediating Environmental Knowledge Sharing, Moderating Technological Innovation. *Journal of Ecohumanism*, 3(7). https://doi.org/10.62754/joe.v3i7.4499

Zhang, X.G., Lin, Z.B., Liu, Y.Z., Chen, X., & Liu, D.M., 2020. How do human resource management practices affect employee well-being? A mediated moderation 20 model. In: *Employee Relations*, 42(4), 903-919. https://doi.org/10.1108/ER-08-2019-0320

Funding: This research was funded by the Slovak Ministry of Education's Scientific grant agency VEGA 1/0718/22 Human resources development in small and medium-sized enterprises in the context of the 21st century challenges.

Author Contributions: Conceptualisation: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*; methodology: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*; data analysis: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*, writing—original draft preparation: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*, writing; review and editing: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*; visualisation: Samuel Body, *Lukrécia Hunková, Katarína Havierniková*. All authors have read and agreed to the published version of the manuscript.

Samuel BODY is the doctoral student at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia. Research interests: human resource management practises, organisational performance, key performance indicator, personnel management.
ORCID ID: https://orcid.org/0009-0000-8058-7662

Lukrécia HUNKOVÁ is the doctoral student at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia. Research interests: issues of competency models, personnel management, HR-managers, Industry 5.0, smart industry.
ORCID ID: https://orcid.org/0009-0003-6940-939X

Katarína HAVIERNIKOVÁ is the Associate Professor at Faculty of Social and Economic Relations, Alexander Dubček University of Trenčín, Slovakia. Research interests: issues of small and medium-sized enterprises, risk management, cluster cooperation, human resources management and regional development.
ORCID ID: https://orcid.org/0000-0002-9019-8684

Copyright © 2024 by author(s) and VsI Entrepreneurship and Sustainability Center
This work is licensed under the Creative Commons Attribution International License (CC BY).
http://creativecommons.org/licenses/by/4.0/
Open Access