



Publisher

<http://jssidoi.org/esc/home>



DEVELOPMENT OF START-UP ECOSYSTEMS IN SELECTED COUNTRIES WITH A FOCUS ON THE CASES*

Vladimir Menshikov ¹, Oksana Ruza ^{2*}, Anastasia Simakhova ³, Jelena Semeneca ⁴

^{1,2*,4} *Daugavpils University, Parades Str. 1, Daugavpils, LV-5401, Latvia*

³ *Liubomyra Huzara Ave, 1, Kyiv, Ukraine, 03058*

E-mails: ¹ vladimirs.mensikovs@du.lv; ^{2*} oksana.ruza@du.lv (Corresponding author); ⁴ natturlix@gmail.com
³ jelena.semeneca@du.lv

Received 12 May 2024; accepted 30 August 2024; published 30 September 2024

Abstract. A study of start-up ecosystems in Latvia and Georgia provides unique insight into the development of innovations in different cultural and economic contexts. The present article aims to analyse how start-ups adapt and thrive, using case studies of three start-ups from each country. The research is based on a case study approach, which allows for a deep and multidimensional analysis of specific start-ups in Georgia and Latvia. Criteria such as innovativeness, impact on local ecosystems, and scaling potential were used to select start-ups. Various data sources were used, including interviews with founders, document analysis, and observations. Data analysis used qualitative methods, including thematic analysis, to identify key themes and relationships. The stated approach made it possible to consider each country's contextual factors and draw informed conclusions about how environmental factors influence the development and sustainability of start-ups. The results identified the main challenges the start-ups face and the opportunities they can exploit for their growth and development. Particular attention is paid to the impact of political stability, availability of funding, and the level of support from public and private entities. The study results may help develop policies to support start-ups and international investors interested in investing in new markets.

Keywords: start-up ecosystems; cases

Reference to this paper should be made as follows: Menshikov, V., Ruza, O., Simakhova, A., Semeneca, J. 2024. Development of start-up ecosystems in selected countries with a focus on the cases. *Entrepreneurship and Sustainability Issues*, 12(1), 411-429. [http://doi.org/10.9770/jesi.2024.12.1\(27\)](http://doi.org/10.9770/jesi.2024.12.1(27))

JEL Classifications: L26, J24, M13, I21

* *The given research was funded by Daugavpils University, Latvia*

1. Introduction

Studying start-up ecosystems in countries with different political, geographic, and cultural contexts is essential for several reasons. Understanding how start-ups evolve in different regions helps to identify unique challenges and opportunities that may arise due to specific economic, political, or cultural conditions. This makes it possible to develop more effective strategies for supporting and developing innovation adapted to particular situations. Exploring diverse ecosystems allows countries to learn from each other. For example, the successes and failures of start-ups in one country can provide valuable lessons for other countries with similar conditions or ambitions. Start-ups often operate in a global context, and understanding different ecosystems can help companies better navigate at the international level, find partners, expand markets, and adapt to global trends (Abdelkafi & Tauscher, 2016; Geissdoerfer et al., 2018; Perdomo-Charry et al., 2023).

A detailed study and understanding of start-up ecosystems can increase the visibility and attractiveness of these countries to international investors. This can lead to an influx of investment, promoting economic growth and technological development. Start-ups can contribute to job creation and stimulate economic development. Understanding how ecosystems influence the growth and sustainability of start-ups can help to formulate policies aimed at improving the quality of life of communities (Adner, 2017; Ferreira et al., 2024; Ávila-Robinson et al., 2022; Arora & Dhiman, 2024).



Figure 1. Start-up ecosystems
Source: elaborated by the authors

Ecosystems can ensure the success of start-ups, reducing the current failure rate by approximately 90%. Even though there are significant differences between countries such as Latvia and Georgia, exploring their start-up ecosystems can offer valuable lessons and opportunities for local and international stakeholders. Analysing start-ups from these countries can effectively study start-up ecosystems, mainly if a case study analysis approach is used. Indeed, like any other method, a case study has its strengths and weaknesses. This method is widely used in the social sciences to gain an in-depth understanding of specific situations. It is a powerful tool for studying

complex phenomena in their real-world context. A case study allows for a thorough analysis of a particular case, which provides a detailed understanding of the object or phenomenon being studied. This method considers the context of the situation, which is vital for understanding the social and cultural aspects influencing the subjects' behaviour. The researcher can use multiple data sources (interviews, observations, documents), which facilitates a multidimensional understanding of the case (Cockayne, 2019; Bărbulescu et al., 2021; Bouncken et al., 2021; Corvello et al., 2023).

By analysing unique or extreme cases, theoretical propositions can be developed or refined, which can be tested in other studies. The results of case studies often provide specific recommendations that can be useful for practitioners or policymakers. However, due to the uniqueness of each case, the study results are difficult to generalise to a broader population. Case selection, data interpretation, and the researcher's personal beliefs can influence the study's objectivity. The quality and availability of data can significantly affect the conclusions of a study. If there is insufficient data, the analysis may be superficial. An in-depth analysis of one or more cases requires significant time and resource investments. The researcher may miss essential elements or fail to consider all possible variables that influence the phenomenon being studied. Using a case study requires careful planning and clearly understanding its limitations. When combined with other research methods, a case study can significantly enhance understanding of complex social phenomena (Eisenhardt & Graebner, 2007; Geissdoerfer et al., 2018; Skawińska & Zalewski, 2020; Ferreira et al., 2024).

2. Literature review

Let us analyse the reflection of the concerns regarding the "start-up ecosystem" in the authoritative Scopus and Web of Science database. The number of publications reflecting this issue in scientific editions indexed in the Scopus scientometric database amounted to 223 articles, Web of Science – 104 articles. The number of publications increases every year.

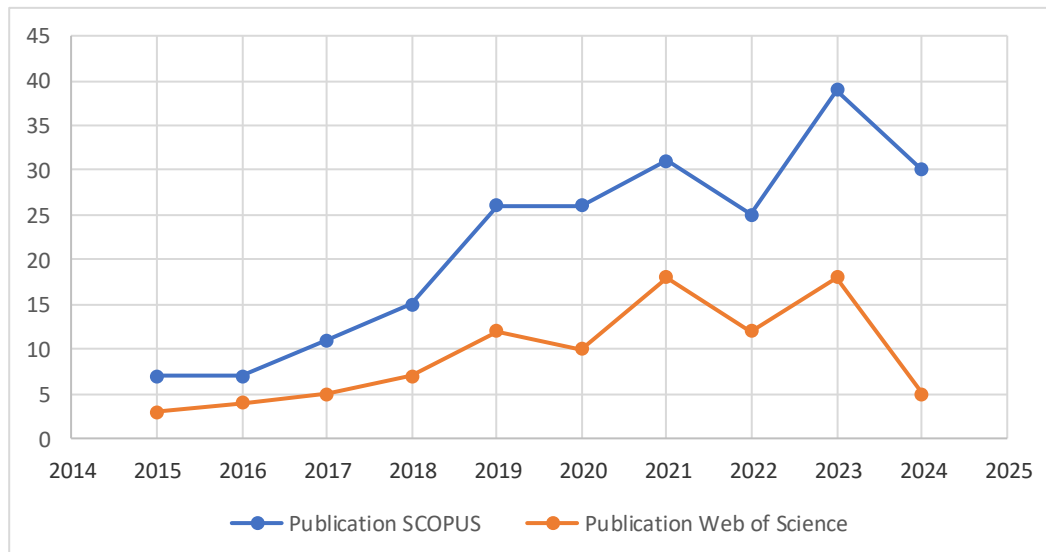


Figure 2. Documents by year, which contain the words "start-up ecosystems a case study" in the title, abstract or keywords within the Scopus and Web of Science database from 2015 to 2024.

Source: elaborated by the authors based on the SCOPUS and Web of Science database

According to the Scopus database, researchers from the United States (30 publications), Italy (24) and Brazil (22) and the Web of Science, researchers from the United States (12 publications), England (10) and Italy (10) were the most active ones in their consideration of the issues that are of interest (See Figure 1). There are no studies on start-up ecosystems in Latvia, Georgia, or Ukraine, a case study in the SCOPUS database. In the Web of Science database, there is 1 study in Ukraine.

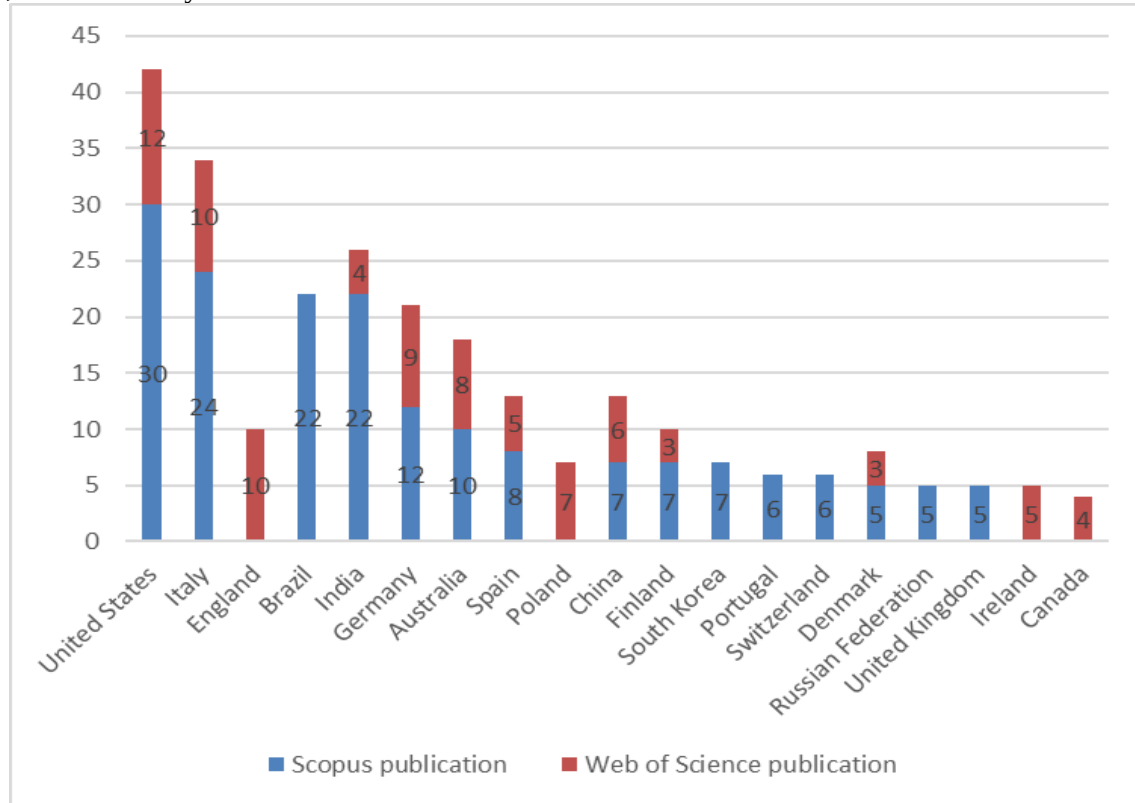


Figure 3. Documents by country, which contain the words “start-up ecosystems a case study” in the title, abstract or keywords within the Scopus and Web of Science database from 2015 to 2024.
Source: elaborated by the authors based on the SCOPUS database

The results displayed in Figure 2 confirm the high interest of scientists from various fields of science in this particular topic.

On the SCOPUS database, many publications deal with business, management and accounting (28%), followed by computer science (18%). At the same time, 11% of the total number of publications are represented by economics and other social sciences. On the Web of Science database, a lot of publications deal with business economics (41%), Environmental Sciences Ecology (9,49%), and Science Technology Other Topics (8,86%).

The analysis of publications related to "Start-up Ecosystems: A Case Study" showed that most often, researchers of this topic cite the paper of Motoyama & Knowlton (2016) “Examining the Connections within the Start-up Ecosystem: A Case Study of St. Louis”. This study explores how an entrepreneurial ecosystem is structured using an exploratory and bottom-up approach. The authors apply a social network approach by analysing the connections of the ecosystem at multiple layers: (1) among entrepreneurs, (2) among support organisations, and (3) among entrepreneurs and key support organisations. Through a series of interviews with entrepreneurs and

support organisations in St. Louis, the study discusses how support organisations in the region interacted with each other and with entrepreneurs, including explicit cross-organisational collaboration and strategic structuring of resources, significantly impacted the way that entrepreneurs interacted with one another and with organisations, thus deepening our understanding of these connections and identifying intervening points within the ecosystem (Motoyama & Knowlton, 2016).

The research paper of Leong et al. (2017), *Nurturing a FinTech Ecosystem: The Case of Youth Microloan Start-up in China*, describes a case study exploring the development of a FinTech company in China that offers micro-loans to college students. Five lessons learned are presented for organisations to manage the challenges better and leverage the opportunities amidst the disruption of the financial sector. The findings also shed light on how digital technology 1) offers the strategic capability for a firm to occupy a market niche in the financial sector, 2) enables the generation of alternative credit scores based on non-traditional data, and 3) improves the financial inclusion of previously excluded market segments. (Leong et al., 2017).

Ghezzi (2019) describes Digital start-ups launching original value propositions can test out and validate their business model using a recent and emerging set of practices known as Lean Start-up Approaches (LSAs), which consist of Customer Development and the Lean Start-up. While LSAs are gaining momentum in the digital start-up ecosystem, they still need better theoretical foundations and operational issues that hinder their adoption and implementation. This study aims to go beyond recalling anecdotal and single-case examples and, through mixed-methods research involving 227 digital start-ups, provide a first large-scale analysis of (i) if and how digital start-ups apply Lean Start-ups Approaches; (ii) the ensuing results; (iii) the main advantages and disadvantages that stem from adopting and implementing LSAs; and (iv) how digital start-ups connect and combine the LSAs with other entrepreneurial approaches and tools for launching start-ups. The findings reveal that most of the sample has adopted LSAs and obtained several benefits. A list of practical guidelines for solving the existing drawbacks and enhancing the effectiveness of adopting and implementing LSAs is proposed. To conclude, a framework for organising the empirical findings is put forward, where LSAs are inserted into the entrepreneurship theory debate on Effectuation, Entrepreneurial Bricolage and Opportunity Creation. Suggestions are then provided on how to sequence and bridge effectuation and causation logics and decision-making tools in an "entrepreneurial opportunity space" (Ghezzi, 2019)

In a literature review focused on start-up ecosystems, it is essential to analyse what various scholars have contributed to understanding the concept and highlight the gaps in existing research.

An ecosystem, particularly in the entrepreneurial context, refers to a network of interconnected entities interacting within a specific geographical or industry-based setting, including entrepreneurs, investors, support organisations, government bodies, and academic institutions. The key objective of the ecosystem is to foster innovation, resource-sharing, and collaboration to enable start-ups' successful emergence and growth.

Motoyama and Knowlton (2016) defined ecosystems as dynamic networks of entrepreneurs and support organisations, emphasising the critical role of cross-organisational collaboration and resource structuring. Their work provides a social network perspective that reveals how interactions between various entities shape the overall structure of the ecosystem.

In contrast, Leong et al. (2017) focused on the FinTech ecosystem, stressing how digital technology and alternative data foster inclusivity in the financial sector. This perspective highlights the ecosystem's ability to innovate and adapt through technology, driving financial inclusion for previously underserved market segments.

Ghezzi (2019) brought up the concept of Lean Start-up Approaches (LSAs) and their relevance in digital start-ups, showing how ecosystems support methodological experimentation. The author focused on how LSAs fit into the broader entrepreneurship theory and connect with other frameworks like Effectuation and Bricolage.

Despite numerous authors studying ecosystems, gaps still require further research. Hence, there is a lack of integration between digital and traditional start-up ecosystems: while the studies emphasise traditional ecosystems (e.g., St. Louis) and digital ecosystems (e.g., FinTech), there's a gap in understanding how digital and traditional ecosystems interact, particularly in cities where technology plays a crucial role in driving business.

More exploration of cross-sector ecosystem interactions still needs to be done. Most studies focused on specific sectors like FinTech or geographic areas like St. Louis. However, comprehensive research needs more insight into how ecosystems from different industries or regions interact and the synergies that may emerge from such interactions.

Focus on the role of policy and government intervention still needs to be increased. More research is needed on how policies and government initiatives actively shape and influence the ecosystem's structure, particularly in fostering collaboration and breaking down barriers between public and private sector stakeholders.

Empirical analysis of lean start-up approaches in practice has to be deepened. While Ghezzi explores LSAs in a broad sense, there's limited empirical work on how LSAs are adopted explicitly by start-ups across diverse industries and cultural contexts and how this adoption varies by ecosystem maturity.

Building on the literature, we can define an entrepreneurial ecosystem as a dynamic network of interconnected entities - entrepreneurs, support organisations, government agencies, and investors - within a geographical or industry-specific setting, where resources, knowledge, and technology flow to support the emergence and scaling of start-ups. The ecosystem's success depends on fostering collaboration, innovation, and inclusivity through digital tools, policy frameworks, and structured entrepreneurial methodologies.

3. Theoretical basis and methodology of the research

The study used general and special methods: historical – to study the degree of knowledge of the problem; analytical-synthetic, comparative – to identify trends in start-up ecosystems based on the collected empirical material; inductive – for generalisation and systematisation of the conclusions. The typological analysis method was used to differentiate the number of international studies, and the content analysis method was used to study documents. Particular attention is paid to the study of ecosystem factors that influence the success of start-ups. Knowing these factors helps one understand the context in which start-ups develop and determine the aspects of the ecosystem that need to be improved. Ecosystem benchmarking allows one to compare start-up ecosystems in different countries or regions. Studying differences in connections, structure, and dynamics between ecosystems helps identify the strong and weak points of each ecosystem (Zaidi et al., 2023), learn from best practices (Audretsch et al., 2018), and facilitate the sharing of best practices (Lee & Shin, 2017).

Latvia is experiencing a slight decline of 8 points and ranks 47th in the Global Ranking. In Eastern Europe, Latvia dropped three positions and now ranks 10th. Riga, the capital, remains in the world's top 200 but drops 13 positions. In Eastern Europe, Riga dropped one place and took the 14th position. Riga is ranked 15th in the 3D printing industry.

Georgia has continued its positive momentum since 2022, completing a 10-point climb. Georgia continues its positive momentum for the third consecutive year. Georgia jumps one point to rank the 38th in Europe. The

country maintains the 2nd position in the Central Asia Regional Economic Corporation (CAREC), up from the 4th in 2021. Tbilisi lost its positive momentum, declining by 12 points to rank 371st, and now ranks 5 points lower in the CAREC region at 27th place. Tbilisi excels in the cryptocurrency industry, standing 10th in Europe. (StartupBlink, 2024).

The sources of material for the empirical analysis were a wide range of official databases: international organisations (Global Competitiveness Index), Business Doing, Eurostat, Global Entrepreneurship Monitor (GEM), Global Entrepreneurship Index (GEI), Business Register; other secondary information sources, as well as personal knowledge and experience of the authors as witnesses to the transformation of the Latvian and Georgian ecosystem. Case studies are also carried out, with particular attention to the role of the entrepreneurial ecosystem in identifying and transforming opportunities and the dynamic nature of its development.

The growth trajectories of the analysed companies differ significantly, including the degree of contribution to the entrepreneurial system of Latvia and Georgia. The subject of the study was mostly ICT companies, which is primarily due to the practical significance of studying one of the fastest growing sectors, generating the main flow of innovative ideas for start-ups (including “unicorns”) and transforming consumer behaviour (Venkataraman, 2004). The information and communication technologies (ICT) market includes communication services and information technologies (computers, network equipment, software, IT services). In addition, “the ICT sector has the greatest potential” (EDF, 2013), since it is home to a significant number of fast-growing companies (Mason & Brown, 2014, p. 2). The study is devoted to the analysis of cases, the selection of which used the following criteria: 1) the idea that gave impetus to the creation of the enterprise is of Latvian and Georgian origin; 2) the company provides an example of a “success story” in the ICT sector; 3) the company is among 30 start-ups that managed to attract maximum investment. The activities of start-ups were mainly analysed based on publications in the media, the websites of the companies themselves, official databases of the Register of Business Enterprises and annual corporate reports. Start-ups were analysed in the context of realising opportunities within the entrepreneurship ecosystem.

4. Analysis of start-up ecosystems by country

The article mentions various metrics and indices used to analyse start-up ecosystems. Here are some of the most important and relevant metrics that help evaluate and compare start-up ecosystems across countries:

The Global Start-up Ecosystem Index is constructed using hundreds of thousands of data points, processed through a sophisticated algorithm that considers several dozen parameters across various dimensions. The algorithm processes data from multiple sources, both public and proprietary, across different dimensions of the ecosystem. These include Start-up metrics: Number of active start-ups, success stories, unicorns, and exits; Funding and investment: Volume of venture capital, angel investments, crowdfunding activities, and public funding; Talent pool: Availability of skilled workers, particularly in technical fields like software engineering, data science, and product development; Infrastructure: Number of accelerators, incubators, co-working spaces, and innovation hubs; Regulatory environment: Ease of business formation, legal frameworks, intellectual property laws, and taxation policies; Research and innovation: Number of research institutions, R&D investments, and collaboration between academia and the private sector; Global connectivity: International reach of local start-ups, cross-border collaborations, and market access; Start-up culture and events: Frequency and scale of start-up events, hackathons, and meet-ups that foster community engagement.

The Ease of Doing Business Index, developed by the World Bank, provides a comparative analysis of the regulatory environment for business operations across various countries. It assesses how conducive or restrictive local regulatory frameworks are for business activities, measuring economies' ease of starting, operating, and closing businesses. Below is a detailed description of the methodology used to construct the index. The Ease of

Doing Business Index data is primarily gathered from two sources: Surveys conducted with over 12,500 business practitioners, lawyers, accountants, and government officials globally. Secondary data was collected from governments, regulatory agencies, and legal texts. The World Bank's team works with local experts in each country to ensure accuracy and relevance. The index is based on ten key indicators that capture the lifecycle of a typical business, from its establishment to its closure. Each indicator is designed to assess a specific aspect of regulatory efficiency or complexity:

Global Innovation Index This index assesses the level of innovation in a count, indirectly indicating the startup ecosystem's quality and innovative photosystem. It includes indicators related to technical innovation, research and development.

Global Competitiveness Report provides data on the competitiveness of a country, including infrastructure, the stability of the macroeconomic environment, and the health of education, which are essential for supporting start-ups.

Latvia and Georgia have come a long way towards creating a favourable business environment, achieving low levels of corruption, and significantly simplifying bureaucratic procedures. In 2020, Georgia ranked 7th in the Ease of Doing Business Index, and Latvia ranked 19th (Ease of Doing Business), (World Bank, 2020).

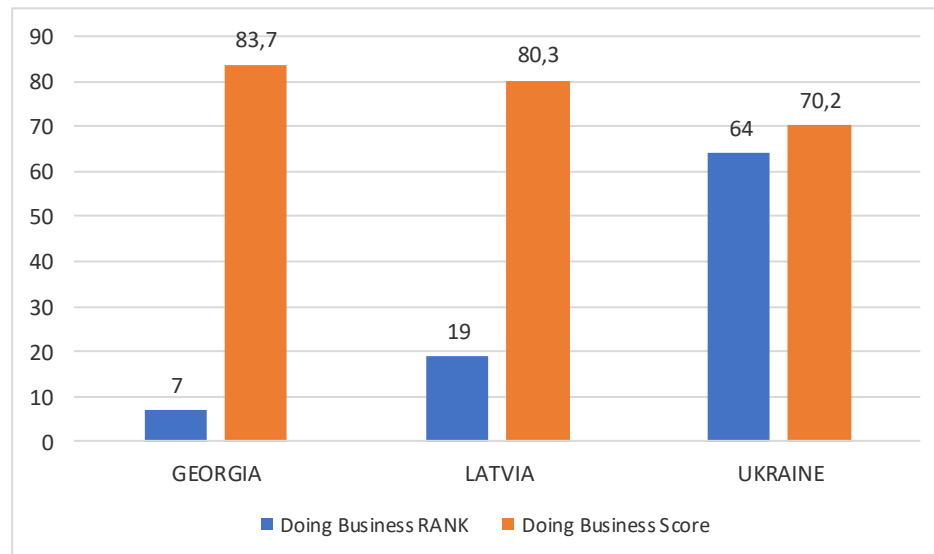


Figure 4. Ease of Doing Business rankings.

Note: Initially, the authors intended to study Ukraine's ecosystem; alas, due to the invasion of Russia, such analysis becomes not relevant

Source: elaborated by the authors based on (World Bank, 2020)

Today, 99% of government services can be obtained online. Administrative procedures are kept to a minimum. For example, as part of the Start-up Visa program, foreigners are given equal opportunities as Latvian citizens to create their businesses online, which has been used by about 21,000 e-residents (Freedomhouse, 2017). In Latvia – Getting Electricity, Dealing with Construction Permits, Resolving Insolvency. In Georgia – Resolving Insolvency, Trading across Borders, Getting Electricity (WEF, 2018).

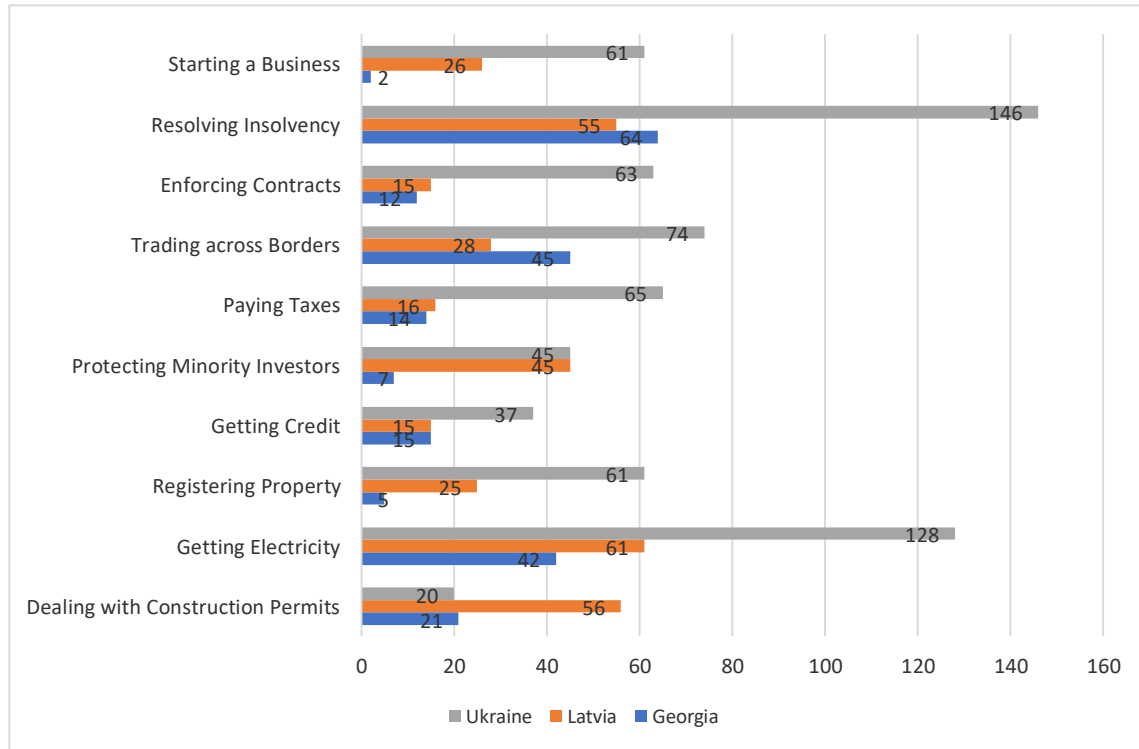


Figure 5. Doing Business rank, 2020*

Note: Initially, the authors intended to study Ukraine's ecosystem; alas, due to the invasion of Russia, such analysis becomes not relevant

Source: elaborated by the authors based on World Bank, 2017

The experience of three countries can serve as a successful example of moving away from the typical development trajectory of a small market through government support for globally oriented sectors of the national economy.

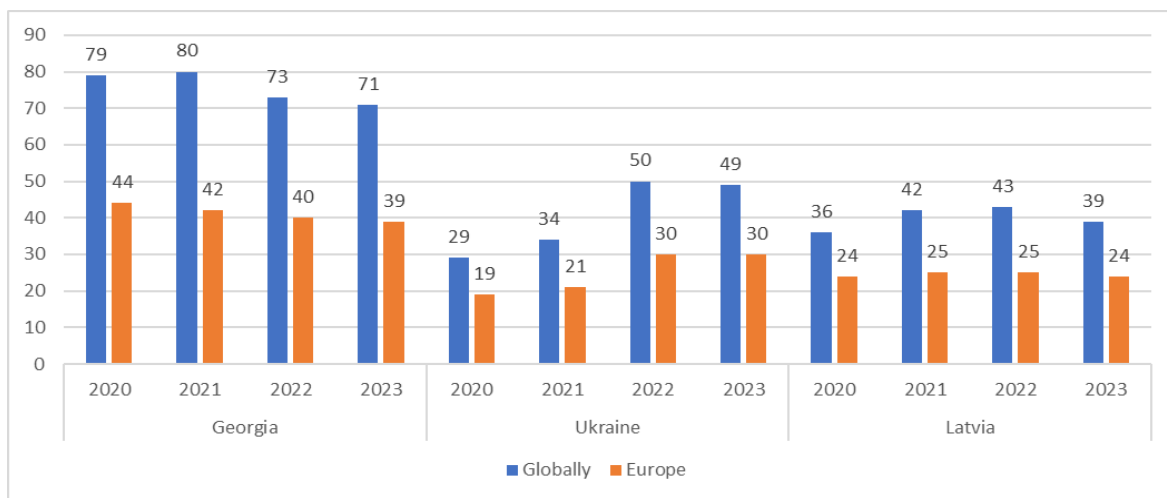


Figure 6. Global Start-up Ecosystem Index 2023

Note: Initially, the authors intended to study Ukraine's ecosystem; alas, due to the invasion of Russia, such analysis becomes not relevant

Source: elaborated by the authors

The Global Start-up Ecosystem Index report evaluates start-up ecosystems of 1000 cities and 100 countries. Among the countries in the report, start-up ecosystems are presented: Latvia and Georgia. At the same time, all countries entered the top hundred ecosystems of the world.

Table 1. Innovation economies by income group

GII rank	Economy	Score	Income group rank	Region rank
37	Latvia (High-income)	39,7	35	24
65	Georgia (Upper middle-income)	29,9	14	8

Source: elaborated by the authors on Global Innovation Index 2023

However, for a deeper understanding of the dynamics of the ecosystem, it is essential to analyse several specific cases that demonstrate the main trends and changes in the entrepreneurial ecosystem and the behaviour of its direct participants – ICT companies.

Printify: a revolution in the Printing Industry in dropshipping.

Printify was founded in 2015 Riga, Latvia, by A. Kehris, G. Dukurs, and J. Berdigans.(Dienas Bizness, 2020, 2022). Later, it established its headquarters in San Francisco, California. (THE BUSINESS JOURNALS, 2019) It is headed by J. Berdigans (IR, 2021) In May 2018, Printify received an investment of \$1 million to expand its services to the United States. (Start-ups, 2018). The following year, it received an additional investment of \$3 million, including from H&M. (ProQuest, 2019). (Delfi Bizness, 2019). In November 2020, Printify relocated its headquarters to Spikeri, Riga. It was also included in the “Financial Times” list in 2020. In October 2021, Printify received an investment of \$45 million in Series A funding (ENG.LSM.lv., 2021; (Management Today, 2022).

Printify is a print-on-demand platform that allows anyone to create and sell customised products with their designs. It integrates with various e-commerce platforms such as Shopify, Etsy, and WooCommerce and offers a wide range of products, including t-shirts, mugs, phone cases, and more. In the 2020 "Financial Times" list of the fastest-growing technology companies in the US, "Printify" was ranked 15th, according to Labs of Latvia. On the other hand, in the US business magazine "Inc." in the top of 5000 fastest growing companies published last August, the company was ranked 24th. The top was created based on the turnover data of companies from 2015 to 2018, wrote Labs of Latvia. Printify is a Latvian start-up that is changing the e-commerce industry.

Printify was created to disrupt the overly complex printing and gift industry so creative minds, time-strapped entrepreneurs, and everyone can do what they do best: create great products, drive sales, and run their businesses.

Printify operates on a drop shipping model, i.e., the company does not manufacture or stock products. Instead, it partners with suppliers who print and ship products to customers on demand. Printify profits from the difference between the price customers pay and the price it pays its suppliers.

The Latvian start-up has raised \$45 million in Series A funding*. The round was led by "Index Ventures", with participation from "H&M Group", "Virgin Group", and several angel investors from the tech and entertainment sectors. It is one of the largest Series A funding rounds in the Baltics this year. The company plans to use the funds to expand into global markets.

Dino Becirovic, CEO of “Index Ventures”, points out that the start-up has removed all barriers to product creation and enabled more than two million content creators to start successful product businesses. “Over time, as more

producers join the network and new technologies and production methods become available, Printify will enable everyone to realise their boldest product ideas." In January 2021, "Index Ventures" named Latvia the most start-up-friendly country in Europe (LIAA, 2021).

"Printify" headquarters is located in Latvia. Still, it employs almost 500 specialists worldwide, doubling the number of employees in the last year and planning to continue expanding the team. Last year, the company's team grew from 100 to 300 employees within a year. (LIAA, 2020). At that time, J. Berdigans admitted that rapid growth is a big challenge, primarily related to the pandemic caused by COVID-19 and one of its consequences – the e-commerce boom. Currently, 500 people are working in the "Printify" team. The start-up has over 70 open positions in product management, programming, marketing and design. Almost every one of these positions provides opportunities for remote work. Printify is available in over 150 countries and supports multiple languages. The company has offices in the US, Latvia and China. One priority area is expanding its presence in the European market. Although most entrepreneurs use the Printify platform in the US, the partner base continues to expand geographically. It aims to cover new regions, providing customers with even more high-quality products. There are currently 67 suppliers of printing products in more than 100 locations worldwide.

Printify has become a unicorn and has received numerous awards and recognitions. In 2023, the company was named a finalist in several categories at the Latvian Start-up Awards, highlighting its importance and success in the startup ecosystem. This recognition comes from their innovative approach to print-on-demand, which has significantly impacted the e-commerce space by providing powerful tools for small businesses and solopreneurs worldwide.

Printify, as a well-known Latvian unicorn start-up, has attracted the attention of many researchers and analysts, especially regarding its impact on the e-commerce industry and innovation in print-on-demand. This interest is due to several factors:

1. Innovative model: Printify is changing how manufacturing and distribution are done, making it an interesting case study in business models and start-up ecosystems.
2. Impact on the economy: As a unicorn start-up, Printify significantly impacts the Latvian economy and the global market, making it essential for economic research.
3. Role in the start-up ecosystem: Printify is an example of a successful start-up from a small country, making it a valuable case study for international entrepreneurship and innovation research.

Optio.AI: a revolution in the sales industry

Optio.AI is a Georgian fintech start-up that develops AI-powered products to automate sales and customer service through virtual assistants known as chatbots. The start-up was founded by Giorgi Mirzikashvili and Shota Giorgobiani in 2016 and has received significant support, including legal support from leading Georgian law firm McGill. Optio.AI was also the first fintech start-up in Georgia to receive the international ISO/IEC 27001 certification, which confirms the company's high level of information security management. Optio.AI offers two key products: the Optio Insight sales growth and automation platform and Optio Conversation, a virtual automated customer service assistant. These products are used by banks and other institutions for which information security is critical.

Optio.AI provides digital banking solutions using analytics and artificial intelligence to improve customers' banking experience. The company's core product is chatbots that analyse bank accounts, customer spending habits, and goals and offer budget plans and recommendations to maintain healthy financial discipline. These tools help bank customers make informed financial decisions, which creates value for both the customers and the banks by improving their service and increasing customer satisfaction. Optio.AI monetises by selling

subscriptions to its products to financial institutions, including banks and other lending institutions. In addition, the company generates revenue by licensing its technology and providing consulting services in data management and artificial intelligence.

Thus, Optio.AI not only creates unique solutions for the fintech sector but is also actively expanding its capabilities by attracting investments and expanding its presence in the market. (Valuer, 2022). Optio.AI is one of the leading fintech companies in the region. The company is based in the capital of Georgia, Tbilisi, and, so far, has received over \$116,000 in funding. The company's developments include chatbots that analyse customers' bank accounts, spending habits, and financial goals, offering optimised budget plans and recommendations for maintaining a healthy financial state. Optio.AI is focused on providing financial technology solutions, especially through its chatbots that help users manage their finances. Their initial market focus is Georgia, but they also plan to expand to the US and European markets. The primary target audience is consumers looking to manage their finances through digital platforms better. Over time, the company aims to offer its products to a wider range of users outside of Georgia, with plans to scale to other countries.

Optio.AI received the “Best Digital Transformation Project of the Year” award at the 13th awards ceremony in Cybersecurity and IT Innovations. This prestigious recognition highlights the commitment of Optio.AI to innovation and its success in delivering transformative solutions that enable businesses to achieve their goals Forbes Georgia. (Forbes, 2017). Through its product development, Optio.AI continues to innovate in the marketing space, focusing on solutions that improve efficiency, optimisation, and customer satisfaction.

Grammarly: a revolution in education

Ukraine now suffers an invasion of Russia. There are several start-up companies in Ukraine that are unicorns. We will describe the case of one of them, the first Ukrainian unicorn – Grammarly (Grammarly, 2024). The company was created in 2009 by three Ukrainians – Maksym Lytvyn, Oleksiy Shevchenko and Dmytro Lider. (UCLUSTER, 2020) At first, the start-up was called MyDropbox. Its idea was to prevent plagiarism in academic works. Therefore, after some time, the company Blackboard, which provides educational services, acquired this start-up. To date, the given start-up has developed an online service that helps users improve texts in English using artificial intelligence. The service checks and corrects grammar and style and provides advice to help avoid these mistakes. It was valued at over \$1 billion in investor circles in 2019. Over 500 employees work in the company's four offices – Kyiv, San Francisco, New York and Vancouver. (Grammarly, 2024).

Grammarly is a popular writing assistant that uses artificial intelligence to help people improve their writing skills. Grammarly operates on a freemium subscription-based SAAS business model (basic features are free, and premium features require payment) (<https://businessmodelanalyst.com/grammarly-business-model/>). Premium Subscriptions: individual users can access the basic features provided by Grammarly for free. However, they can upgrade to a premium version to get more advanced features, such as plagiarism detection, vocabulary suggestions, and writing style checks based on genre. In addition to subscriptions, Grammarly also makes money by licensing its software to universities and offering expert writing services. These services include professional proofreading, editing, and writing support for businesses and individuals. Grammarly also makes money from professional writing services provided by real people. In mid-November 2021, the popular automated text editing tool Grammarly raised \$200 million in funding, valuing the start-up at \$13 billion (TADVISER, 2024). New investors included Baillie Gifford and BlackRock. The company plans to use the raised funds to accelerate the introduction of innovative products and grow the team in general. (TADVISER, 2024. BlackRock.)

According to Forbes, the company's estimated capitalisation in 2024 is \$8.1 billion; in 2023, it will be \$9.8 billion (FORBES, 2024). AI technologies are used to write texts. The service has gone beyond correcting grammar and

helps improve the clarity, interest and tone of writing. Grammarly is based on artificial intelligence and can analyse complex aspects of language and communication. The start-up serves more than 30 million customers worldwide. (MKS GUIDE, 2023) The company has about 700 corporate clients, including Cisco, Boeing, Dow Jones, Dell, Expedia, Salesforce and leading US universities. Grammarly plans to use the investment to improve its technologies further to solve language and communication problems. In particular, it will continue to work on the tone detector and further product development for business clients.

Some of Grammarly's most significant competitors include:

ProWritingAid is one of Grammarly's biggest competitors, offering similar features and tools for grammar checking, writing style analysis, and more. ProWritingAid is best suited for long-form content. However, it is an excellent option for shorter formats as well;

Microsoft Word and Apple Pages – built-in grammar checkers that offer many of the same tools as Grammarly. However, they are not as comprehensive as Grammarly and do not offer as many additional features;

WhiteSmoke – a grammar checker that offers a range of features, including grammar checking, plagiarism detection, and more. However, it is not as user-friendly as Grammarly and can be challenging to navigate;

Ginger – a grammar checker that offers features similar to Grammarly, including grammar checking, spelling correction, and more. However, it is not as comprehensive as Grammarly and does not offer as many additional features. (PAYSPACE, 2022):

The rationale for case selection: The selected start-ups (Printify, Optio.AI, Grammarly) are chosen based on their success and recognition in their respective ecosystems. These start-ups exemplify how a well-developed ecosystem can help grow and propel start-ups to success.

Lessons and recommendations from Latvia (using Printify as an example) – dropshipping model: Printify successfully uses the drop-shipping model, minimising the risks and costs associated with producing and storing goods. This allows the company to focus on design and marketing. Global scaling – Printify has started operations in a small country and has successfully entered international markets, emphasising the importance of a worldwide orientation even for start-ups from small countries.

5. Research results and discussion

In this study, the research aimed to uncover the relationship between a country's entrepreneurial ecosystem and the success of individual start-ups. While the ecosystems of the countries under study (Latvia and Georgia) were not the direct focus of the research results, the findings reveal significant insights into how these ecosystems indirectly contribute to the success of start-ups.

Latvia's start-up ecosystem can become one of the country's core economic engines. With easy access to Europe, availability of skilled IT talent, a multilingual population, and an affordable cost of living, the potential of Latvia's start-up ecosystem is clear.

Ukraine is experiencing an invasion now. Before the war, the country managed to create a start-up ecosystem that was both scalable and global. Some examples of impressive start-ups originating in Ukraine are People.ai, Grammarly, Gitlab, and Ahrefs, all with massive global member bases. A primary reason for Ukraine's previous success is the talent of its developers, who are sought after by many foreign companies, either remotely or in local development centres.

Georgia provides a good model for Central Asia's open and transparent economy. The Ministry of Economy and Sustainable Development is focused on supporting start-up ecosystem development, primarily through its subdivision, Georgia's Innovation and Technology Agency (GITA). Some of the organisation's initiatives include pre-acceleration and acceleration programs, boot camps, and community events for start-ups and investors. Furthermore, Start-up Georgia continuously gathers data about investments, funding, failures and exits of Georgian tech start-ups to showcase the state of the ecosystem reliably.

With a high-income economy, Latvia ranks 24th in the Global Start-up Ecosystem Index 2023, and Georgia, with an upper middle-income – 39th place.

The study contributes to the existing literature by contextualising how entrepreneurial ecosystems in small markets, such as Latvia and Georgia, can produce globally successful start-ups. It challenges the notion that large, well-established ecosystems are the only environments conducive to producing unicorns and highlights the potential of emerging markets.

One of the novel insights is the importance of global connectivity. The research shows that start-ups in small countries can succeed globally by leveraging international networks of investors, customers, and partners. This finding suggests that global outreach can compensate and enable success even with limited local resources.

Impact of Ecosystem Evolution: The research also highlights how ecosystems evolve and how this evolution impacts start-up success.

Having studied the presented cases of start-ups from Latvia and Georgia, the following similarities and differences in their approaches and development conditions can be highlighted:

Similarities of all three start-ups. All three start-ups actively use the latest technologies (e.g., print-on-demand at Printify, artificial intelligence at Optio.AI, and artificial intelligence for text checking at Grammarly) to solve specific problems or improve service quality. Even though the start-ups are based in different countries, they are all focused on the international market, emphasising the start-up ecosystem's global nature. Each of the start-ups successfully attracted investments to provide the companies with the capital necessary for developing their projects, which indicates a high level of investor confidence in innovative projects from different countries.

Differences of the studied start-ups lie in the following areas.

Fields of activity and products – Printify is engaged in on-demand printing, Optio.AI focuses on AI-powered fintech solutions for the banking sector, and Grammarly offers tools for checking the grammar and style of texts. This diversity shows the specifics of each country's ecosystem and the different directions of the development of tech start-ups.

Scope of growth and development – Printify has reached the status of a "unicorn" and is expanding into international markets; Grammarly has also achieved significant global influence, while Optio.AI, although successfully developing and attracting investments, has a more limited presence in the market.

Influence on local ecosystems – each start-up contributes to the development of the start-up ecosystem of its country in different ways. For example, Printify stimulates the development of the e-commerce industry in Latvia,

Optio.AI actively contributes to developing the fintech sector in Georgia, and Grammarly contributes to improving technological literacy and communication skills at the international level. These differences and similarities highlight the unique opportunities and challenges of different geographic and cultural contexts and trends in the global start-up ecosystem.

Studying the start-up ecosystems of Latvia and Georgia allows us to identify several lessons and recommendations that can be useful for the development of start-ups in other countries and regions.

Conclusions

Different stages of ecosystem evolution generate different entrepreneurial opportunities. The integration of industry ecosystems has become closer — educational, entrepreneurial, engineering, design, etc. — through the establishment and implementation of long-term programmes for the development of the ecosystem as a whole (digital telecommunications), the education system (ICT) and entrepreneurial skills at all levels, the use of a long-term approach and stimulation of human capital development. The role of integration of local and global entrepreneurial ecosystems has increased. The growth of foreign investment, including in start-ups, indicates increased trust. In addition to the combination and maturity of factors that determine the emergence of windows of opportunity, the interaction of all components of the entrepreneurial and other ecosystems is of decisive importance.

The study of start-up ecosystems in Latvia and Georgia, based on the analysis of the cases of Printify, Optio.AI and Grammarly, allows us to draw the following key findings and determine their significance for understanding the development of start-up ecosystems in these countries:

Adaptability and Innovation: All three start-ups demonstrate high innovation and adaptation to changes in the global economic environment. Using cutting-edge technologies, such as artificial intelligence and e-commerce platforms, highlights their ability to develop technologies and adapt products to market needs rapidly.

Globalisation and Scaling: Despite their geographical and economic differences, start-ups from Latvia and Georgia have successfully entered international markets, demonstrating the global potential and international competitiveness of start-ups from these countries.

Attracting Investments: All three companies have attracted significant investments, indicating the trust of international and local investors in start-ups from these regions. It also reflects the founders' ability to convince investors of the potential of their business models and growth strategies.

Social and economic impact: The start-ups significantly impact local economies through job creation, attracting foreign investment and promoting technological development. They also improve the quality of life and access to innovative services.

By analysing the described cases, other start-ups and policymakers can learn from successful projects and understand potential challenges and barriers to scaling and international success. **Support Strategies:** Provides evidence of the effectiveness of specific start-up support policies, such as tax incentives, grants for research and development, and simplification of the process of obtaining international certifications. **Cultural and Economic Adaptations:** Highlights the importance of considering cultural and economic specificities when developing and adapting products for different markets, which is critical for start-ups seeking to globalise. Overall, this analysis confirms that start-ups from Latvia and Georgia are actively shaping the tech landscape of their countries and making a significant contribution to the global start-up community through their innovation, adaptability, and strategic approach to scaling and international growth.

The findings from the analysis of the start-up ecosystems in Latvia and Georgia provide valuable information that can be used to shape and improve start-up support policies. Here are some key areas where this data can be applied:

Formation of targeted support programmes. **Investment incentives:** The successful attraction of investments by start-ups such as Printify and Grammarly highlights the need to create attractive conditions for investors, including tax incentives, grants and subsidies that can stimulate venture financing. **Innovation grants:** Developing new technologies requires significant research and development expenditures. Providing grants and funding for research and development can help start-ups survive the initial stages of innovation development and commercialisation.

Improving the regulatory environment. Simplifying procedures: Reducing the bureaucracy of company registration, obtaining patents, and certifying products can make it much easier for start-ups to launch and expand. International standards: Supporting start-ups in obtaining international certifications, as Optio.AI has done, can increase their competitiveness and credibility in the global market.

Human capital development. Educational programmes: Investing in academic programmes focusing on developing technology, entrepreneurship, and innovation skills can prepare the talent base needed to grow the start-up ecosystem.

University partnerships: Encouraging collaboration between start-ups and academic institutions to conduct joint research and develop new technologies.

Facilitating international expansion. Export support: Creating programs that help start-ups find partners abroad and adapt products to new markets. International partnership networks: Developing networks with international accelerators and incubators to share knowledge and resources.

Suggested directions for further research:

Analysis of support effectiveness: Regularly analyse the results of the application of support policies to determine their efficiency and possible improvements.

Comparative studies: Research of successful international practices and their adaptation to local conditions.

Long-term market research: Monitoring and analysing trends in developing global start-up ecosystems to anticipate changes in the industries where local start-ups are active.

Applying these approaches and directions in start-up support policy can significantly improve the conditions for developing innovative entrepreneurship and promote economic growth and technological progress in the country.

The research has provided a nuanced understanding of how entrepreneurial ecosystems in smaller markets contribute to start-up success. The novelty of the findings lies in the contextual analysis of these ecosystems and their ability to produce globally competitive start-ups despite the inherent challenges of smaller markets. However, the study's limitations highlight the need for further research to explore these ecosystems more broadly and understand other start-ups' diverse experiences within these environments. This study is a foundation for future research and offers valuable insights for policymakers and entrepreneurs looking to foster thriving start-up ecosystems in similar contexts.

References

Audretsch, D., Mason, C., Miles, M.P., & O'Connor, A. 2018. The dynamics of entrepreneurial ecosystems. *Entrepreneurship and Regional Development*, 30(3-4), 471-474. <https://doi.org/10.1080/08985626.2018.1436035>

Abdelkafi, N., & Tauscher, K., 2016. Business models for sustainability from a system dynamics perspective. *Organ. Environ.*, 29, 74e96. <https://doi.org/10.1177/1086026615592930>

Adner, R. 2017. Ecosystem as Structure: An Actionable Construct for Strategy. *Journal of Management*, 43(1), 39-58. <https://doi.org/10.1177/0149206316678451>

Arora, M., & Dhiman, V. 2024. Strategising the entrepreneurial ecosystem of start-ups for rebuilding communities. *Strategic Tourism Planning for Communities: Restructuring and Rebranding*, pp. 247-260. <https://doi.org/10.1108/978-1-83549-015-020241019>

Ávila-Robinson, A., Islam, N., & Sengoku, S. 2022. Exploring the knowledge base of innovation research: Towards an emerging innovation model. *Technological Forecasting and Social Change*, 182, 121804. <https://doi.org/10.1016/j.techfore.2022.121804>

Bărbulescu, O., Tecău, A.S., Munteanu, D., & Constantin, C.P. 2021. Innovation of start-ups, the key to unlocking post-crisis sustainable growth in Romanian entrepreneurial ecosystem. *Sustainability*, 13(2), 671, 1-16. <https://doi.org/10.3390/su13020671>

Bouncken, R.B., Kraus, S., & Roig-Tierno, N. 2021. Knowledge- and innovation-based business models for future growth: digitalised business models and portfolio considerations. *Review of Managerial Science*, 15(1), 1-14. <https://doi.org/10.1007/s11846-019-00366-z>

Cockayne, D. 2019. What is a start-up firm? A methodological and epistemological investigation into research objects in economic geography. *Geoforum*, 107, 77-87. <https://doi.org/10.1016/j.geoforum.2019.10.009>

Corvello, V., Felicetti, A.M., Steiber, A., & Alänge, S. 2023. Start-up collaboration units as knowledge brokers in Corporate Innovation Ecosystems: A study in the automotive industry. *Journal of Innovation and Knowledge*, 8(1), 100303. <https://doi.org/10.1016/j.jik.2022.100303>

Dienas bizness. 2020. *Printify* atklāj jauno biroju. <https://www.db.lv/zinas/anastasija-oleinika-klus-par-printify-izpildidirektori-511435>

Eisenhardt, K., & Graebner, E. 2007. Theory building from cases: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25-32. <https://doi.org/10.5465/AMJ.2007.24160888>

EDF. 2013. Smart Specialisation – Qualitative Analysis. <http://www.arengufond.ee>

European Commission. 2017. European Innovation Scoreboard 2017. Brussels: European Commission. URL: http://www.eurostat.eu/elementos/ele0014400/Methodology_Report_EIS_2017/inf0014422_c.pdf

ENG.LSM.lv. 2021. Printify secures substantial investment. <https://eng.lsm.lv/article/economy/business/printify-secures-substantial-investment.a420093/>

Freedomhouse (2017) Freedom on the Net. <https://freedomhouse.org/report/freedom-net/2017/estonia>

Forbes, 2017. Optio-Ai Georgian Finance Chatbot. <https://forbes.ge/optio-ai-georgian-finance-chatbot/>

Forbes, 2024. Forbes переоцінив статки співзасновників Grammarly. Частки співзасновників Шевченка та Литвина знову подешевшали. <https://forbes.ua/news/forbes-pereotsiniv-statki-spivzasnovnikov-grammarly-chastki-spivzasnovnikov-shevchenka-ta-litvina-znovu-podeshevshali-29022024-19546>

Ferreira, J. J., C Fernandes, A. J., & Ramírez-Pasillas, M. (2024). Start-ups and entrepreneurial ecosystems in the circular economy: A multi-level approach for safe and just planetary boundaries. *International Small Business Journal*, 42(4), 416-445. <https://doi.org/10.1177/02662426231210765>

Global Innovation Index. 2023. <https://www.drishtias.com/daily-updates/daily-news-analysis/global-innovation-index-2023>

Grammarly. 2024. Responsible AI that ensures your writing and reputation shine. <https://www.grammarly.com/>

Ghezzi, A. 2019. Digital start-ups and the adoption and implementation of Lean Start-up Approaches: Effectuation, Bricolage and Opportunity Creation in practice. *Technological Forecasting and Social Change*, 146(C), 945-960. <https://doi.org/10.1016/j.techfore.2018.09.017>

Geissdoerfer, M., Vladimirova, D., & Evans, S. 2018. Sustainable business model innovation: A review. *Journal of Cleaner Production*, 198, 401-416. <https://doi.org/10.1016/j.jclepro.2018.06.240>

IR. 2021. "Printify" vadītājs: Mūsu vīzija ir pievērst pasauli ražošanai pēc pieprasījuma. <https://ir.lv/2021/09/09/printify-vaditajs-musu-vizija-ir-pieverst-pasaui-razosana-pec-pieprasijuma/>

Leong, Carmen & Tan, Barney & Xiao, Xiao & Tan, Felix Ter Chian & Sun, Yuan. 2017. Nurturing a FinTech ecosystem: The case of a youth microloan start-up in China. *International Journal of Information Management*, 37(2), 92-97. <http://doi.org/10.1016/j.ijinfomgt.2016.11.006>

Lee, I., & Shin, Y.J. 2018. Fintech: Ecosystem, business models, investment decisions, and challenges. *Business Horizons*, 61(1), 35-46. <http://doi.org/10.1016/j.bushor.2017.09.003>

LIAA. 2021. Latvija – jaunuzņēmējiem draudzīgākā valsts Eiropā. <https://labsoflatvia.com/aktuali/jaunuznemejiem-draudzigaka-valsts-eiropa>

LIAA. 2020. Gada laikā aug trīskārt. URL: <https://labsoflatvia.com/iedvesmas-stasti/printify-aug-triskart>

Mason C., & Brown R. 2014. Entrepreneurial ecosystems and growth oriented entrepreneurship. LEED Working Paper. Paris: OECD. Режим доступа: <https://www.oecd.org/cfe/leed/Entrepreneurial-ecosystems.pdf>

Management Today. 2022. Inside Latvia's first unicorn. <https://www.managementtoday.co.uk/inside-latvias-first-unicorn/smes/article/1791185>

Motoyama, Y., & Knowlton, K. 2016. Examining the Connections within the Start-up Ecosystem: A Case Study of St. Louis. *Entrepreneurship Research Journal*, 7(1). <https://doi.org/10.1515/erj-2016-0011>

MKS GUIDE. 2023. Grammarly Statistics (2023) – Key Stats and Figures. <https://www.mksguide.com/grammarly-user-and-company-stats/>

PAYSPACE, 2022. Artificial intelligence and unique functions: How Ukrainian start-up Grammarly became a unicorn without investment. URL: <https://psm7.com/uk/technology/shtuchnij-intelekt-ta-unikalni-funkci%D1%97-yak-ukra%D1%97nskij-startap-grammarly-bez-investicij-stav-yedinorogom.html>

Perdomo-Charry, G., Clegg, S., & Schweitzer, J. (2023). Do start-up ecosystems foster start-up performance? The moderating role of network learning capability. *International Journal of Entrepreneurship and Innovation* <https://doi.org/10.1177/14657503231169889>

ProQuest. 2019. Latvia's Printify start-up raises EUR 2.7 million for further growth. <https://www.proquest.com/docview/222255413?sourcetype=Newspapers>

Start-ups. 2018. Printify, a new marketplace for custom printing, raises \$1 million see. URL: https://techcrunch.com/2018/05/07/printify-a-new-marketplace-for-custom-printing-raises-1-million-seed/?guccounter=1&guce_referrer=aHR0cHM6Ly9lb3Jlbi53aWtpcGVkaWEub3JnLw&guce_referrer_sig=AQAAAJDy8PhrqWQvNEmxn66hYIE-xt3DBRvyFabjIfeT_rDHzmnxAxvNMVdAWGYVBoa25ymZ0BXfbMajM3-5BMOG-j4XovkWnWjxxIwpxk1NUQjv0dVlMLSm21uAJD_5YJJosAAycHnqsmAW_u0HscOgZtH4ns3SUEXFgQ5tO23Y-nWP

Skawińska, E., & Zalewski, R. 2020. Success factors of start-ups in the EU-a comparative study. *Sustainability*, 12(19), . 8200. <https://doi.org/10.3390/su12198200>

TADVISER. 2024. Start-up. <https://www.tadviser.ru/index.php/%D0%A1%D1%82%D0%B0%D1%82%D1%8C%D1%8F:%D0%A1%D1%82%D0%B0%D1%80%D1%82%D0%B0%D0%BF%D1%8B#.D0.A1.D1.82.D0.B0.D1.80.D1.82.D0.B0.D0.BF.D1.8B.D0.B2.D0.95.D0.B2.D1.80.D0.BE.D0.BF.D0.B5>

TADVISER. 2024. BlackRock. <https://www.tadviser.ru/index.php/%D0%9A%D0%BE%D0%BC%D0%BF%D0%B0%D0%BD%D0%B8%D1%8F:BlackRock>

THE BUSINESS JOURNALS. 2019. Homegrown S.F. print-on-demand start-up looks to shift to the Baltic. <https://www.bizjournals.com/sanfrancisco/news/2019/10/04/homegrown-s-f-print-on-demand-startup-looks-to.html>

UCLUSTER. 2020. Successful Ukrainian start-ups: An example of Grammarly — an online grammar check service. <https://ucluster.org/blog/2020/10/grammarly-online-servis-perevirky-gramatiki/>

Zaidi, R., Khan, M., Khan, R., & Mujtaba B. 2023. Do entrepreneurship ecosystem and managerial skills contribute to start-up development? *South Asian Journal of Business Studies*, 12(1) <http://doi.org/10.1108/SAJBS-07-2020-0233>

Start-up Blink. 2024. Global Start-up Ecosystem Index 2024. <https://www.startupblink.com/startupecosystemreport>

Valuer. 2022. Best Fintech Start-ups in Asia. <https://www.valuer.ai/blog/best-fintech-startups-in-asia>

Venkataraman, S. (2004) Regional transformation through technical entrepreneurship. *Journal of Business Venturing*, 19, 153-167. <https://doi.org/10.1016/j.jbusvent.2003.04.001>

WIPO. 2023. Global Inovation Index 2023. <https://www.drishtias.com/daily-updates/daily-news-analysis/global-innovation-index-2023>

WEF. 2018. Global Competitiveness Report 2018. <https://www.weforum.org/publications/the-global-competitiveness-report-2018/>

World Bank. 2020. Ease of Doing Business rankings <https://archive.doingbusiness.org/en/rankings>

World Bank. 2017. World Development Report 2017. https://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/2022-05/WDOR_2017.pdf

Funding: This research was funded by Daugavpils University, Latvia

Data Availability Statement: More information can be obtained on request from the corresponding author.

Author Contributions: Conceptualisation: V.M., O.R., A.S., J.S.; methodology: V.M., O.R., A.S., J.S.; data analysis: V.M., O.R., A.S., J.S.; writing - original draft preparation: V.M., O.R., A.S., J.S.; writing; review and editing: V.M., O.R., A.S., J.S.; visualisation: V.M., O.R., A.S., J.S. All authors have read and agreed to the published version of the manuscript.

Vladimir MENSHIKOV is Dr.sc.soc., Professor at Daugavpils University. His research interests include sociology of security; regional development; capital theory. He is an Expert of the Latvian Council of Science in the fields of economics and sociology.

ORCID ID: <https://orcid.org/0000-0001-9988-8588>

Oksana RUZA is Dr.oec., Docent, Researcher at the Institute of Humanities and Social Sciences of Daugavpils University (Latvia). She is an Expert of the Latvian Council of Science in the fields of economics. Her research interests include regional economics, industrial economics, finances.

ORCID ID: <https://orcid.org/0000-0002-6194-3841>

Anastasiia SIMAKHOVA is Professor of National Aviation University, Ukraine. Research interests: social economy models, global economy social metrics, national economy development, socialisation, globalisation, economic and social development.

ORCID ID: <https://orcid.org/0000-0001-7553-4531>

Jelena SEMENECA is Dr. philol., Docent, Department of Languages and Literature at the Faculty of Humanities and Social Sciences of Daugavpils University.

ORCID ID: <https://orcid.org/0000-0003-1733-2709>

