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EXPLORING THE IMPORTANCE OF LOGISTICS IN THE STRATEGIC BUSINESS DECISIONS OF BULGARIAN SMEs*

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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

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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 & Daskevici, 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",

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. Morrissey 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

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/>.

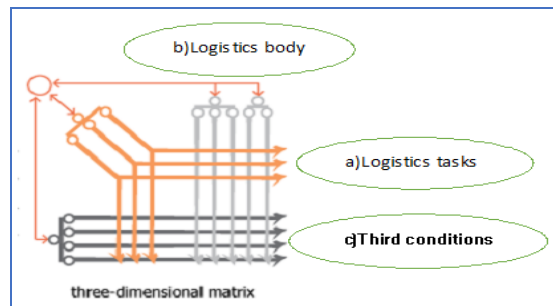


Figure 1. 3-D matrix for logistics decision-making

$$M = \left(\begin{array}{c|c|c} \vec{A} & \vec{B} & \vec{C} \end{array} \right)$$

$$\left(\begin{array}{c} \vec{v} \\ \vec{u} \\ \vec{w} \end{array} \right) \left(\begin{array}{c|c|c} \vec{A} & \vec{B} & \vec{C} \end{array} \right) = \left(\begin{array}{ccc} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{array} \right) \quad \begin{array}{l} v \cdot A = 1 \\ v \cdot B = 0 \\ v \cdot C = 0 \end{array}$$

$$\vec{v} = \alpha \left(\vec{B} \times \vec{C} \right) \quad v = \frac{B \times C}{A \cdot (B \times C)} \quad \begin{array}{l} u = \frac{C \times A}{B \cdot (C \times A)} \\ w = \frac{A \times B}{C \cdot (A \times B)} \end{array}$$

$$Mx = b \quad \left(\begin{array}{c|c|c} \vec{A} & \vec{B} & \vec{C} \end{array} \right) \begin{pmatrix} x_1 \\ x_2 \\ x_3 \end{pmatrix} = \begin{pmatrix} b \end{pmatrix} \quad x_1 = v \cdot b = \frac{b \cdot (B \times C)}{A \cdot (B \times C)}$$

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.

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.

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. <i>Descriptive statistical methodology</i> - 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. <i>Analysis of measurements' reliability</i> - Cronbach's alpha (Tau-reliability test score coefficient); 3. <i>Analysis of measurements' validity</i> - 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. <i>Pearson correlation analysis</i> 5. <i>Regression analysis</i> - 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.

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.

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.

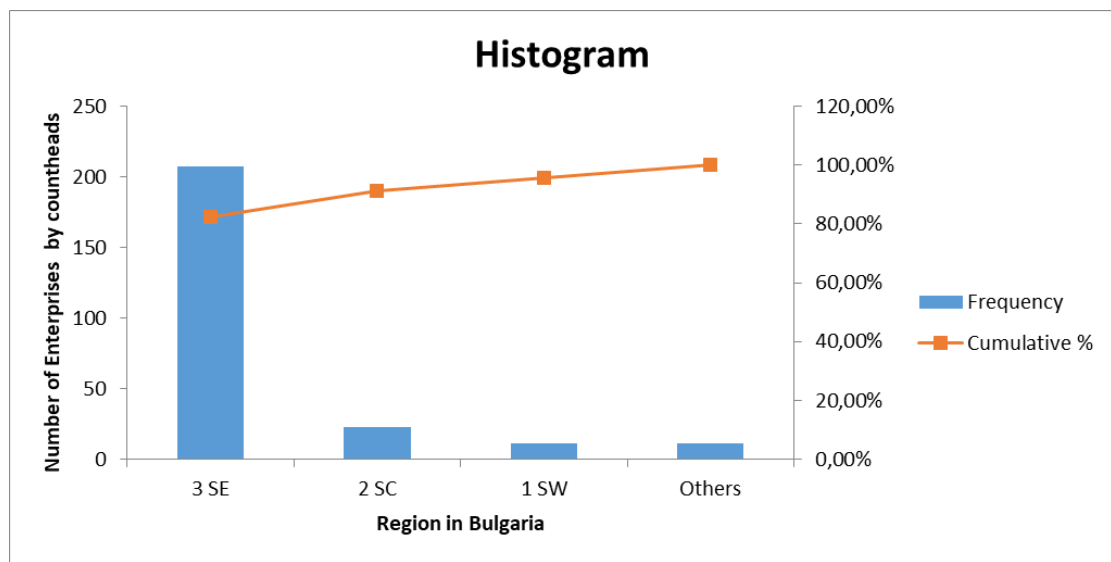


Figure 3. Administrative-geographical distribution of the headquarters of SME respondents in the study, where: 1. Southwest Bulgaria; 2. Southcentral Bulgaria; 3. Southeast Bulgaria

Table 2. The Number and Percentage Distribution of Participants

<i>Bin</i>	<i>Frequency</i>	<i>%</i>	<i>Bin</i>	<i>Frequency</i>	<i>Cumulative %</i>
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

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.

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.

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 $GCV = \frac{\text{sum}(n\text{-construct} \cdot \text{weight by respondent})}{\text{number of participants} \cdot \text{value of the positive response}}$. 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

Considerations	Matrix of Factors			GCV	
	Target			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.

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 2-tailed				
* Significant Correlation at ,05 2-tailed				

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							
Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.	Collinearity Statistics	
	β	Std. Error	Beta			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.

$\hat{Y} = \beta + \text{sum}(\beta \text{Variables})$

$\hat{Y} = 0.38 \text{ Const} + 0.002 \text{ TMBL}$

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					
Model	Unstandardised Coefficients		Standardised Coefficients	t	Sig.
	β	Std. Error	β		
(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).

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.

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