

THE LOGISTIC DRIVERS AS A POWERFUL PERFORMANCE INDICATOR IN THE DEVELOPMENT OF REGIONAL COMPANIES OF KOSOVO

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Abstract

Regional companies in Kosovo operate in challenging economic conditions that hinder their ability to survive and develop. However, the management of logistics supply chain managers can increase their performance and help in their further development. The main purpose of this research is to investigate whether the management of logistics supply chain drivers can serve as a formal predictor and driver of the development of regional companies in Kosovo. The study aims to help Kosovo's regional companies in a formal and independent way to integrate with supply chains, increasing their performance and development amid the difficult economic conditions in which they operate. The research approach and method is based on a quantitative survey conducted among 103 regional companies of Kosovo. Data was analyzed using descriptive statistics and hypotheses are tested using Pearson Correlation Coefficient. The results of the statistical analysis showed that the management of the six logistics drivers of the supply chain affects the increase in the performance of regional companies. It is mainly influenced by the information logistic driver, compared to other drivers, it turns out that over fifty percent of the respondents believe that the information logistic driver is the most important, followed by the next driver with sixteen percent transport, twelve percent facilities, nine percent resources, seven percent inventory and only one percent price. From the analysis of the questionnaire data, the importance and quality of road transport in the performance of regional companies was clearly highlighted. Implications and managerial practices of this research will serve as an aid to policy makers and institutions when designing development initiatives for regional infrastructure, economic zones and locations.

Keywords: logistic drivers, regional development, inventory, transportation, information

JEL classification: R10, R11, R40, R58, M10

1. Introduction

The literature review of this paper is focused on various sources such as statistical data, reports, regulations and research papers. The structure of the composition of this paper includes data from the legal cooperation frameworks of Kosovo's regional cooperation, where various important issues are taken into account in the implementation of supply chain processes, including the responsible institutional bodies and the role of international partners. Moreover, data from various reports and reliable statistical data for the development indicators of different countries are presented in this paper. A variety of research findings and recommendations are elaborated separately to address each of the variables in this survey research method.

Kosovo Economic overview

Kosovo is a lower-middle income economy and one of only four economies in Europe to grow every year since the onset of the global financial crisis in 2008. With a population of 1.8 million, Kosovo is the second smallest economy in the Western Balkans after Montenegro.

The Kosovar economy has maintained consistent growth in recent years (Table 1). Real growth in gross domestic product (GDP) averaged about 3.2% per year¹ over 2013-17: a noteworthy performance compared to other economies in the region (EC, 2018[1]). Despite recording positive growth rates, however, Kosovo was still the second poorest economy in Europe in 2017, after Moldova, with an average GDP per capita of USD 3 894.

Table 1. Kosovo: Main macroeconomic indicators (2013-18)

Indicator	Unit of measurement	2013	2014	2015	2016	2017	2018
GDP growth	% year-on-year	3.4	1.2	4.1	3.4	4.2	3.8**
Inflation	% average	1.8	0.4	-0.5	0.3	1.5	0.3**
Government balance	% of GDP	-3.1	-2.2	-2.0	-1.2	-0.8	..
Current account balance	% of GDP	-3.4	-6.9	-8.6	-8.3	-6.0	-6.5**
Exports of goods and services ¹	% of GDP	21.9	22.5	21.9	22.2	27.0	27.5**
Imports of goods and services	% of GDP	49.6	51.2	50.4	50.8	53.8	54.8**
Net FDI	% of GDP	5.3	2.7	5.3	3.6	4.5	3.7**
External debt	% of GDP	30.2	31.2	33.3	33.2	32.6	..
Gross international reserves	Ratio of 12 months imports of goods moving average	7.4	6.0	5.9	5.0	4.9	4.9**
Unemployment	% of total active population	30.00	35.3	32.9	27.5	30.5	27.9**
National GDP	Billion euros	5.3	5.6	5.8	6.1	6.4	..

Note: *projection; **average of 1st and 2nd quarter.

Sources: EC (2018[2]), "EU candidate countries' and potential candidates' economic quarterly (CCEQ): 3rd quarter 2018", https://ec.europa.eu/info/sites/info/files/economy-finance/tp028_en.pdf; EBRD (2018[3]), Transition Report 2018-2019: Work in Transition, <https://2018.tr.ebrd.com/countries/#> Eurostat (2018[4]), Eurostat (database), <https://ec.europa.eu/eurostat/web/national-accounts/data/database>.

Table 2. Number of registered companies in Kosovo by enterprise size and region

Region	Year	Enterprise size, by employment				Total	Share of total number of enterprises
		0-9	10-49	50-249	250+		
Gjakova	2018	3,408	162	17	2	3,589	9,40%
Gjilan	2018	3,580	233	20	0	3,833	10,04%
Mitrovica	2018	3,069	146	23	2	3,240	8,49%
Peja	2018	3,189	185	23	2	3,399	8,90%
Prizren	2018	5,625	317	34	3	5,979	15,68%
Prishtina	2018	12,602	1,111	216	47	13,979	36,62%
Ferizaj	2018	3,898	231	28	1	4,158	10,89%
Kosovo	2018	35,374	2,385	361	57	38,177	100,00%

Source: Statistical Agency of Kosovo, 2018.

SMEs in the national economy

Kosovo's classification of SMEs is defined by the law on foreign investment which entered into force in 2014. The only criterion is employment size, which is in line with the EU definition (Table 3).

Table 3. Definition of micro, small and medium-sized enterprises in Kosovo

Size	EU definition	Kosovo definition
Micro	< 10 employees, turnover ≤ EURO 2m	< 10 employees
Small	< 50 employees, turnover ≤ EURO 10m	< 50 employees
Medium	< 250 employees, turnover ≤ EURO 50m	< 250 employees

Note: In Kosovo the classification of SMEs is defined by Law No. 04/L-220 on Foreign Investments. The SME categorisation is based on the number of employees (Article 2, paragraph 1.21).

For purposes related to the law on bankruptcy an SME is defined as a business organisation which has an annual turnover of up to EUR 1 million or has up to 25 employees. This definition is only applied in bankruptcy cases.

Source: Republic of Kosovo (2014[23]), Law No. 04/L-220 on Foreign Investment, <https://mti.rks-gov.net/desk/inc/media/1916AE1F-48E8-451D-A328-CA350EC4D7D2.pdf>.

Conceptual Framework

A supply chain is a network (Tsiotas and Polyzos, 2018) of relationships formed by more than two individuals or associations involved in the upstream or downstream realization of products, services, finance and information from a source to a client (Mentzer et al., 2001). According to another definition, the supply chain is defined as the cluster that includes suppliers, logistics service providers, manufacturers, distributors and dealers and where information flow takes place between these mentioned stakeholders (Kopczak, 1997). Supply chain management includes internal and external activities by the business to deliver high-value products to customers (Shahzadi et al., 2013). According to another definition, supply chain management is defined as the entire process of handling raw materials, processing raw materials and transforming them into products and delivering them to consumers, as part of the operations and stakeholders that host storage, transport, transport activities (Yavuz & Ersoy, 2013).

Businesses in the supply chain have to make individual or corporate decisions to improve their logistics performance. These decisions are made using the major logistic drivers of the supply chain.

Logistic Drivers of Supply Chain

The impact of supply chain logistics drivers of three factors: facility, inventory, transportation (Polyzos and Tsiotas, 2020); It consists of six sections, three cross-functional as information, sourcing and pricing (Chopra & Meindl, 2016). According to another definition there are six units: inventory, transportation, facility location, information, sourcing and pricing (Doan, 2020; Matthew & Othman, 2017; Shahzadi et al., 2013). According to Hugos, (2018), there are five units: production, inventory, location, transportation, and information. According to another definition, there are seven units: production, inventory, transportation, facility location, information, sourcing and pricing (Googlesir.com, 2021).

1. Facilities

Facilities are the physical locations in the supply chain network where products are produced, stored and assembled. Production and storage facilities are important. Because the location, capacity and flexibility of these facilities directly affect the supply chain (Chopra & Meindl, 2016). The facility has a long-term impact on company finances. In addition, it is of priority importance in product development and distribution (Doan, 2020). Therefore, facility location selection is important for the manufacturer to gain competitive advantage (Matthew & Othman, 2017).

1.1. Production

A driver can set up flexible manufacturing factories to have high capacity and a wide range of products. Thus, they become more responsiveness to demand. In addition, responsiveness can be increased by making production through small factories close to large customer groups. In this way, the delivery time is reduced. If businesses want to achieve efficiency, they can optimize production by producing less variety products in factories with less capacity. In addition, businesses can achieve efficiency by using economies of scale (Polyzos, 2019) in large central factories (Hugos, 2018). The performance of the supply chain is directly dependent on production, such as how and when a product should be produced (Googlesir.com, 2021).

1.2. Location

Opening physical stores close to customers will increase responsiveness. McDonalds uses this strategy to stay responsive to its customers. Here, efficiency can be achieved by centralizing common locations. Dell for efficiency serves large markets from several central geographic locations (Hugos, 2018). In this direction, the first hypothesis of this research is as follows:

H1: Place of company is positively correlated with the importance managers put on facilities of regional companies

2. Inventory

Inventory includes raw materials, processes and finished products in the supply chain. Changing inventory policies increases supply chain efficiency and business responsiveness (Chopra & Meindl, 2016). In supply chain management, inventory is an important factor used in balancing supply and demand (Matthew & Othman, 2017). Inventory plays an important role in the management of relations between customers and suppliers (Doan, 2020). The responsiveness of the inventory can be increased by keeping a wide range of products and a high level of stock. Keeping product stock in a center close to the customer provides additional responsiveness. Ensuring efficiency in the inventory depends on reducing the level of products that are not sold very often in the entire inventory. In addition, economies of scale and cost savings can be benefited from by collecting the inventory in a few designated centers (Hugos, 2018). In addition, reducing inventory will increase efficiency but decrease responsiveness (Googlesir.com, 2021). Hence, it comprises one of the most meaningful variables within this research variable scheme and the second hypothesis is given as in the following:

H2: Safe inventory is interwoven with the level of importance managers put on inventory in general

3. Transportation

The transfer of products from one point to another in the supply chain is called transport. Transport may consist of many modes and combinations of transport. The availability of transportation options affects the responsiveness and efficiency of the supply chain (Chopra & Meindl, 2016). Responsiveness can be increased by using a fast and flexible mode of transport. Many companies can improve responsiveness by using a mode of transport that will deliver their products within 24 hours. Moving products in large batches less frequently can increase efficiency. Also ship, rail, pipeline modes can be more efficient for transport. It will be more efficient if the transportation process is done from a central facility (Hugos, 2018). In addition, which mode of transport a product will be transported from one place to another depends on the trade-off between the buyer and the seller. Therefore, decisions should be evaluated in terms of both economic and customer satisfaction (Googlesir.com, 2021). In addition, outsourcing is the agreement of the manufacturers with a third party or business for the transportation to the customer in order to keep the transportation costs low (Shahzadi et al., 2013). In this regard, the next hypothesis is as follows:

H3: Sources provided by regional companies in supply chain performance impact the level of the importance of transportation in the same chain

4. Information

Information consists of data and analysis about inventory, transportation, costs, prices and customers in the supply chain. Information is the biggest driver in the supply chain as it affects other drivers. Information makes the supply chain more efficient and more responsive (Chopra & Meindl, 2016). The development of information technologies in supply chain management has become increasingly common. In addition, due to its multifaceted nature, supply chain management has forced other organizations to communicate online (Matthew & Othman, 2017). The development of information technologies, their easy accessibility and cheapness increase the importance of this driver day by day. Knowledge is just like money. The 4 previously mentioned (production, inventory, location, transportation) drivers increase the performance of supply chain drivers when used with information. Businesses can have a high level of responsiveness when they collect and share data from these four factors. Information collection and sharing is important for suppliers, distributors, manufacturers and large retail stores (Hugos, 2018).

H4: Information in supply chain performance has the major importance in driving factors of a regional company in Kosovo

5. Sourcing

Sourcing is the determination of who will select factors such as production, storage, transportation and information in the supply chain. This decision determines which resource a company produces itself and which is outsourced. Sourcing affects the responsiveness and

efficiency of the supply chain (Chopra & Meindl, 2016). Sourcing is the activity of supplying the right material at the right time, in the right quantity, at the right quality, at the right price. Purchasing in large batches allows suppliers to benefit from economies of scale, improve capacity and processes, and improve customer service. However, if the business uses only one supplier, it faces inventory risk. Sourcing decisions for businesses consist of own manufacturing and outsourcing, supplier selection and procurement. Even if international sources have the cost and complexity of transportation, storage, etc., the cost advantage can be offset by the low prices offered by global suppliers (Googlesir.com, 2021). In addition, outsourcing is an important factor as it can cause a product to be produced at lower costs (Matthew & Othman, 2017). In order to address the importance of resources in the supply chain process of regional companies in Kosovo, it was vital to create a new hypothesis in this research and measure how it affects the annual turnover performance of companies:

H5: Sources provided by regional companies in supply chain performance impact the annual turnover of the company

6. Pricing

Pricing affects the functioning of supply chain management (Doan, 2020). Pricing is the determination of the price of goods and services offered by a business within its supply chain. Pricing affects the buyer's demand for goods and services. This in turn affects the performance of the supply chain. Different pricing affects responsiveness to buyers. A change in pricing affects revenue and costs on other drivers (Chopra & Meindl, 2016).

The cost of a product or service is an important element in pricing. In addition, manufacturers should know the market conditions in order to apply the right pricing strategy (Matthew & Othman, 2017). Pricing is used to match supply and demand. Sellers can eliminate excess supply by making price reductions or delay demand to the next period to prevent seasonal demand increases. Pricing is an important element in the competitive strategies of businesses. Pricing varies according to the targeted customer segment customers with different needs (Googlesir.com, 2021).

2. METHODOLOGY

The questionnaire is adopted from the previous survey that took place in Kosovo. The targeted regional companies consist of respondents from different regions of the country during the course of survey administration. The targets of this study are regional active business respondents during the time of survey administration. Simple random sampling is used to collect data from 103 respondents.

The questions of the first part of the questionnaire, intend to identify the respondent's region (Place), their annual income (Turnover) and number of the employees (Workers).

Since the aim of this research is to search if there is any correlation between logistic drivers and the performance of the regional businesses of Kosovo, the second part of the survey included statements that are grouped under scale called Differences consisted of 6 variables: Q1: Facilities Q2: Inventory, Q3: Transportation, Q4: Information, Q5: Sourcing and Q6: Pricing. The above-mentioned items are measured and are presented below in the data analysis.

3. DATA ANALYSIS

This study aims to contribute by guiding Kosovo's regional companies on how to successfully manage supply chain logistics drivers in order to increase their performance and the country's economic prosperity. This part covers estimations of six items, number, descriptive statistics, crosstabulation analysis and hypothesis test.

Table 4. Regional companies participating in the study

Region/District	Number	Percentage
Prishtina	39	38%
Ferizaj	33	32%
Prizren	19	18%
Gjilan	10	10%
Mitrovica	1	1%
Peja	1	1%
Total	103	100%

Source: Author's data

Descriptive statistics

Descriptive statistics indicating number, mean and standard deviation of all variables are provided within Table 5. Outputs of means and SD are as follows: place (M=3.0000, SD=1.97534); annual turnover (M=1.8350, SD=.76821), number of employees (M=2.0583, SD=.76473); Q1 facilities (M=3.2816 SD=.69193), Q2 inventory (M=3.3010, SD=.65432), Q3 transportation (M=3.5049, SD=.69837), Q4 information (M=3.5631, SD=.58862), Q5 sources (M=3.2913, SD=.96532), Q6 pricing (M=3.1165, SD=.78342).

Table 5. Descriptive statistics of nine variables

Variables	N	Mean	Std. Deviation
Place	103	3.0000	1.97534
Annual Turnover	103	1.8350	.76821
Number of Employees	103	2.0583	.76473
Facilities	103	3.2816	.69193
Inventory	103	3.3010	.65432
Transportation	103	3.5049	.69837
Information	103	3.5631	.58862
Sources	103	3.2913	.96532
Pricing	103	3.1165	.78342

Source: Author's data

Cross tabulation analysis

In this part is presented a summary of respondent's distribution based on place, annual turnover, number of employees and what are their correlations with the logistics drivers: facilities, inventory, type of inventory, transportation, type of transportation, information, sources and pricing.

The first part of the survey is consisted of three variables: place, annual turnover and number of employees. Therefore, the data from the sample regarding the region where the companies operate show us that 38% are from the region of Prishtina, 32% from the region of Ferizaj, 18% from the region of Prizren, 10% from the region of Gjilan, 1% from the region of Peja and 1% from the region of Mitrovica. Respondents are deliberately divided into two categories: respondents according to the number of employees, which results that 26% of regional companies had 0-9 employees, 42% of regional companies had between 10-49 employees and 32% had over 50- 249 employees and respondents by annual turnover, which results that 39% of the sample includes respondents are regional companies with a turnover of < 2 million Euros, 39% are regional companies with a turnover of < 10 million Euros and 22% are regional companies with a turnover annual < 50 million Euro.

Table 6. Importance of logistic driver "facilities"

Valid	Frequency	Valid Percent
Somewhat	14	14%
Neutral	46	45%
Very much	43	41%
Total	103	100%

Source: Author's data

In table 6, the result of the first survey on the importance of the logistics driver of the supply chain "objects" in the performance of the regional companies of Kosovo, shows us that 14% of the respondents consider it partially important in their answer, 45% express as neutral and 41% answered that the logistics driver of the supply chain "facilities" play a very important role in the development performance of companies.

Table 7. Importance of logistic driver "inventory"

Valid	Frequency	Valid Percent
None	1	1%
Somewhat	8	8%
Neutral	53	51%
Very much	41	40%
Total	103	100%

Source: Author's data

In table 7, the result of the second survey on the importance of the logistic driver "inventory" shows us that 1% of the respondents consider it not important, 8% consider it partially important in their answer, 51% express themselves as neutral and 41 % answered that the logistic driver of the supply chain "inventory" plays a very important role in the development performance of companies.

Table 8. Importance of logistic driver "transport"

Valid	Frequency	Valid Percent
None	2	2%
Somewhat	6	6%
Neutral	33	32%
Very much	62	60%
Total	103	100%

Source: Author's data

In table 8, the result of the third survey on the importance of the logistic driver "transport" in the performance of companies, shows us that 2% of respondents consider it not important, 6% consider it partially important in their answer, 32% expressed as neutral and 60% answered that the logistics driver "transport" plays a very important role in the performance of the regional companies.

Table 9. Type of transportation used by regional companies of Kosovo

Valid	Frequency	Valid Percent
Road transport	88	85%
Air transport	8	8%
Intermodal transport	4	4%
Sea transport	3	3%
Total	103	100%

Source: Author's data

In table 9, the result of the survey of what type of transport the regional companies of Kosovo mainly use to increase their performance, it turns out that 85% of the respondents use road transport, 8% use air transport, 4% intermodal combined with more than a transport and 3% sea transport.

Table 10. Importance of logistic driver "information"

Valid	Frequency	Valid Percent
None	1	1%
Somewhat	2	2%
Neutral	38	37%
Very much	62	60%
Total	103	100%

Source: Author's data

In table 10, the result of the fourth survey on the importance of the logistic driver "information" in the performance of regional companies, shows us that 1% of respondents consider it not important, 2% consider it partially important in their answer, 37 % express themselves as neutral and 60% answer that the logistics driver "information" plays a very important role in the performance.

Table 11. Importance of logistic driver "sources"

Valid	Frequency	Valid Percent
Somewhat	13	13%
Neutral	47	45%
Very much	43	42%
Total	103	100%

Source: Author's data

In table 11, the result of the fifth survey on the importance of the logistic driver "sources" in the performance of the regional companies of Kosovo, shows us that 13% consider it partly important in their answer, 45% express themselves as neutral and 42% answer that the logistic driver "sources" play a very important role in performance.

Table 12. Importance of logistic driver price

Valid	Frequency	Valid Percent
None	2	2%
Somewhat	20	19%
Neutral	45	43%
Very much	36	35%
Total	103	100%

Source: Author's data

In table 12, the result of the sixth survey on the importance of the logistic driver "price" in the performance of the regional companies of Kosovo, shows us that 2% of the respondents consider it not important, 19% consider it partially important in their answer, 43% express themselves as neutral and 35% answer that the logistic manager "price" plays a very important role in performance.

Table 13. Importance of the logistic drivers

Logistic Drivers of Supply Chain	Frequency	Valid Percent
Information	57	55%
Transport	17	16%
Facilities	12	12%
Sources	9	9%
Inventory	7	7%
Price	1	1%
Total	103	100%

Source: Author's data

In table 13, the result of the seventh survey on the importance of logistics drivers in the performance of regional companies in Kosovo, shows that 55% of respondents consider "information" very important, 16% consider "transport" important, 12 % say that they consider "objects" important, 9% consider "resources" important, 7% consider "inventory" important and only 1% consider "price" important.

Hypothesis test

Based on the subject studied, the test of hypothesis is conducted using bivariate Pearson Correlation coefficient, r , which measures the strength and direction of linear relationships between pairs of continuous variables. The Pearson Correlation evaluates whether there is statistical evidence for a linear relationship among the same pairs of variables in the sample, represented by a correlation coefficient, ρ ("rho"). The degree of coefficient values can range from +1 to -1, where +1 indicates a perfect positive relationship, -1 indicates a perfect negative relationship, and a 0 indicates no relationship exists. According to Ratner, B. (2009) correlation degrees can be interpreted as quoted below:

Perfect: If the value is near ± 1 , then it said to be a perfect correlation: as one variable increases, the other variable tends to also increase (if positive) or decrease (if negative).

High degree: If the coefficient value lies between ± 0.50 and ± 1 , then it is said to be a strong correlation.

Moderate degree: If the value lies between ± 0.30 and ± 0.49 , then it is said to be a medium correlation.

Low degree: When the value lies below $\pm .29$, then it is said to be a small correlation.

No correlation: When the value is zero'.

Table 14 presents each correlation estimation for all five hypotheses, p value and a sample size on which the below correlations are being estimated.

Table 14: Correlations Hypothesis Test

Hypotheses	Correlation Coefficient	Sig. (2-tailed)	Number of respondents	Test
H ₁ :	.337**	.000	103	Accepted
H ₂ :	.453**	.000	103	Accepted
H ₃ :	.306**	.002	103	Accepted
H ₄ :	.282**	.004	103	Accepted
H ₅ :	.377**	.000	103	Accepted

Source: Author's data

In the first hypothesis, the independent variable is the place and dependent variable satisfaction rate of respondents with the importance of facilities takes value of $r = .337$, $N=103$, p value is $.000$, $p<.001$ which is less than 0.05 . The above-mentioned variables were significantly and strongly and positively correlated. The null hypothesis that the correlation is 0 is rejected. It is accepted that there is a strong correlation between place and facilities in the performance of regional companies.

In the second hypothesis, the independent variable safe inventory and dependent variable inventory in general takes value $r = .453$, $N=103$, p value is $.000$, $p<.001$ which is less than 0.05 . Two variables were significantly, strongly and positively correlated. The null hypothesis that the correlation is 0 is rejected and it is accepted that there is a strong correlation in the performance of regional companies.

The third hypothesis, consisted of independent variable sources and dependent variable transportation $r = .306$, $N=103$, p value is $.002$, $p<.001$ which is less than 0.05 . Two variables were significantly and moderately positively correlated and the null hypothesis that the correlation is 0 is rejected.

The fourth hypothesis, consisted of independent variable information and dependent variable annual turnover $r = .282$, $N=103$, p value is $.004$, $p<.001$ which is less than 0.05 . Two variables were significantly, strongly and positively correlated. The null hypothesis that the correlation is 0 is rejected and it is accepted that the information in supply chain performance has the major importance in driving factors of a regional company in Kosovo.

The fifth hypothesis, consisted of independent variable sources and dependent variable annual turnover $r = .377$, $N=103$, p value is $.000$, $p<.001$ which is less than 0.05 . Two variables were significantly and slightly positively correlated. The null hypothesis that the correlation is 0 is rejected and it is accepted that the sources provided by regional companies in supply chain performance impact the annual turnover of the companies.

4. CONCLUSION

The regional development of Kosovo has been and remains the focus of many policymakers who want to develop initiatives in order to increase the performance of the supply chain of regional companies through the development of economic zones, the creation of infrastructure and the provision of technological services. Despite these initiatives, regional companies in Kosovo are still characterized by low levels of entrepreneurial activity, low survival rate of small companies and lack of business skills by owners and managers of these companies. The World Bank emphasized that these challenges can be addressed through supply chain integration, which involves building capable relationships and processes within and across settlement boundaries. The logistics activity facilitates these relationships between the various role players in their supply chain by managing the six logistics drivers of the supply chain to coordinate the flow of products, services, and information. The purpose of this article was to investigate whether the management of supply chain logistics drivers can increase the chances of regional companies developing further.

Based on the data obtained from 103 regional companies in Kosovo, it was proven that the good management of the logistics drivers affects the increase in the performance of the companies and specifically in the increase in their annual income, and for this a descriptive statistical analysis was developed to identify their influence.

The results of the descriptive statistical analysis showed that the management of six supply chain logistics drivers affects the performance increase of regional companies. From the literature and data analysis, it results that the increase in performance is mainly influenced by the logistic manager of "information" which compared to other drivers in table 13 shows that the regional companies of Kosovo in over 55% of their respondents believe that "information" is the most important logistic driver, followed by the next driver with 16% "transportation", 12% facilities, 9% "resources", 7% "inventory" and only 1% "price". From the analysis of the questionnaire data, the importance of road transport in the performance of regional companies that practice it massively was highlighted.

Referring to the findings of this study, we can come up with some recommendations for the policy makers and institutions of Kosovo to be taken into account in the design of development policies for regional companies. The consideration of "information" as one of the six most important logistic drivers, increases the needs and demands of companies for national investments in technological and informational infrastructure in support of the digitalization of processes which will provide information in real time for effective decision-making. Also, the companies emphasize the need to develop the road infrastructure as a direct influence on the management of the supply chain.

5. References

- Adeitan, D. A., Aigbavboa, C., Agbenyeku, E.E. and Bamisaye, O. S. (2019). 'Industry 4.0 and construction supply chain management: Proceedings of the Creative Construction Conference, pp. 368-375. 29 June – 2 July 2019 Budapest, Hungary.
- Alavian, P., Eun, Y., Meerkov, S. M. and Zhang, L. (2020). Smart production systems: automating decision-making in manufacturing environment. *International Journal of Production Research*, Vol. 58(3), pp. 828–845.
- Alexiadis, S., Ladas, C., & Hasanagas, N. (2013). A regional perspective of the Common Agricultural Policy. *Land Use Policy*, 30(1), 665-669
- Allcock, J. B., Lampe, J. R., & Young, A. (n.d.). Kosovo. Retrieved from <https://www.britannica.com/place/Kosovo>
- Britannica, T. (n.d.). Information Architects of Encyclopaedia. Retrieved from <https://www.britannica.com/facts/Kosovo>
- Butt A.S. Supply chains and COVID-19: impacts, countermeasures and post-COVID-19 era. *Int. J. Logist. Manag.* 2021 in press
- Chiarini, A., Belvedere, V. and Grando, A. (2020). Industry 4.0 strategies and technological developments. An exploratory research from Italian manufacturing companies. *Production Planning and Control*, pp. 1–14.
- Constantin, D. L., Nastacă, C. C., & Geambasu, E. (2021). Population Accessibility To Rail Services. Insights Through The Lens Of Territorial Cohesion. *Regional Science Inquiry*, 13(1), 81-98.
- Curtini E., Valentini E. (2017). Regional strategies for dealing with structural change, *Regional Science Inquiry*, Vol IX (1), pp. 107-117. https://www.rsijournal.eu/ARTICLES/June_2017/8.pdf
- Doan, T.-T. T. (2020). Supply chain management drivers and competitive advantage in manufacturing industry. *Uncertain Supply Chain Management*, 473–480. <https://doi.org/10.5267/j.uscm.2020.5.001>
- Durugbo, C., Tiwari, A. and Alcock, J. R. (2014). Managing integrated information flow for delivery reliability. *Industrial Management and Data Systems*, Vol. 114(4), pp. 628-651.
- Elvis Kushi, Enkela Caka., (2010). Some problems of the Micro, Small and Medium Enterprises in Albanian Holiday Hotels, *Regional Science Inquiry*, Vol II (1), pp. 63-70. https://www.rsijournal.eu/ARTICLES/Journal_2/63-70.pdf
- Farooq M.U., Hussain A., Masood T., Habib M.S. (2021). Supply chain operations management in pandemics: a state-of-the-art review inspired by COVID-19. *Sustainability*. 13(5):2504. doi: 10.3390/su13052504.
- Googlesir.com. (2021). 7 Important Supply Chain Drivers (with Examples). Retrieved from <https://www.googlesir.com/essential-supply-chain-drivers>
- Goula, M., Ladas, Christos, Ap., Gioti-Papadaki, O., & Hasanagas, N. (2015). The spatial dimension of environment-related attitudes: does urban or rural origin matter?. *Regional Science Inquiry*, 7(2), 115-129
- Hamm, R., & Goebel, C. (2008). Identifying Regional Cluster Management Potentials Empirical Results from Three North Rhine-Westphalian Regions. *Regional Science Inquiry*, 2(2), 83-94.
- Huber, J., Muller, S., Fleischmann, M., Stuckenschmidt, H.A. (2019). Data-driven news vendor problem: From data to decision. *European Journal of Operational Research*, Vol. 278, pp. 904-915.

- Ivanov D., Das A. Coronavirus. (2020)., (COVID-19/SARS-CoV-2) and supply chain resilience: a research note. *Int. J. Integrated Supply Manag.* 13(1):90–102.
- Kokkinou, A., Ladas, Christos, Ap., Papanis, E., & Dionysopoulou, P. (2018). Innovation policy in European Union from a supply chain perspective. *Regional Science Inquiry*, 10(1), 141-147
- Ladas, Christos, Ap., & Stamatou, E. (2006). The Macro Region As An Economic Entity And Of Regional Planning. *Montenegrin Journal of Economics*, 2(3), 127-138.
- Ladas, Christos, Ap., Hasanagas, N., & Papadopoulou, E. (2011). Conceptualising ‘macro-regions’: Viewpoints and tools beyond NUTS classification. *Studies in Agricultural Economics*, 113(1316-2016-102776), 138-144.
- Lasi, H., Fettke, P., Kemper, H.G., Feld, T. and Hoffmann, M. (2014). Industry 4.0, business and information systems. *Engineering*, Vol. 6(4), pp. 239–242.
- Lincaru, C., Ghenta, M., Atanasiu, D., Ciuca, V., Dragoiu, C., & Chiriac, B. (2010). Regional Development And Diversity/Variety Of Firms: The Case Of Romania. *Regional Science Inquiry*, 2(2), 119-132.
- Malešević Perović L., Golem S., Government expenditures composition and growth in EU15: a dynamic heterogeneous approach. *Regional Science Inquiry*, Vol. XI, (1), 2019, pp. 95-105
- Mathew, J., & Othman, N. A. (2017). Supply Chain Management (SCM) Utilisation Based on SCM Drivers in Manufacturing Industry. *Jurnal Pengurusan*, 50, 123–132.
<https://doi.org/10.17576/pengurusan-2017-50-11>
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining Supply Chain Management. *Journal of Business Logistics*, 22(2), 1–25.
<https://doi.org/10.1002/j.2158-1592.2001.tb00001.x>
- Polo A., (2010). Globalism - the important factor of the life of the countries of the region in general and in Albania in particular, *Regional Science Inquiry*, Vol II (1), pp. 33-40.
https://www.rsijournal.eu/ARTICLES/Journal_2/33-40.pdf
- Polo, A., Ladas, Christos, Ap., & Caca, E. (2015). Relationship between the Altman Z-Score and Quick Kralicek Test in Assessing Economic Units. *European Journal of Economics and Business Studies*, 1(3), 20-26
- Polyzos, S. (2019) *Regional Development*, 2nd ed.; Kritiki: Athens, Greece; ISBN 9789602187302
- Polyzos, S., Tsiotas, D., (2020) “The contribution of transport infrastructures to the economic and regional development: a review of the conceptual framework”, *Theoretical and Empirical Researches in Urban Management*, 15(1), pp.5-23
- Polyzos, S., Tsiotas, D., Minetos, D., (2013) “Determining the Driving Factors of Commuting: An Empirical Analysis from Greece”, *Journal of Engineering Science and Technology Review*, 6(3), pp.46 -55.
- Rao, K., & Young, R. R. (1994). Global Supply Chains: Factors Influencing Outsourcing of Logistics Functions. *International Journal of Physical Distribution & Logistics Management*, 24(6), 11–19.
<https://doi.org/10.1108/09600039410066141>
- Sajjad, A., Eweje, G., & Tappin, D. (2020). Managerial perspectives on drivers for and barriers to sustainable supply chain management implementation: Evidence from New Zealand. *Business Strategy and the Environment*, 29(2), 592–604. <https://doi.org/10.1002/bse.2389>
- Sakamoto H., (2012). CGE Analysis of transportation costs and regional economy: East Asia and Northern Kyushu, *Regional Science Inquiry*, Vol IV (1), pp. 121-140.
https://rsijournal.eu/ARTICLES/June_2012/121-140.pdf
- Santos K., Goncalves H., Sequeira T., Diniz F., (2019). Development and Solidarity Economy Strategies in Brasil: Case studies, *Regional Science Inquiry*, Vol XI (II) Special Issue, pp. 153-165.
https://www.rsijournal.eu/ARTICLES/June_2019/SI/14.pdf
- Serdarasan, S. (2013). A review of supply chain complexity drivers. *Computers & Industrial Engineering*, 66(3), 533–540. <https://doi.org/10.1016/j.cie.2012.12.008>
- Shahzadi, I., Amin, S., & Chaudhary, K. M. (2013). Drivers of Supply Chain Performance Enhancing Organizational Output : An Exploratory Study for Manufacturing Sector. *European Journal of Business and Management*, 5(14), 53–65.
- Skapinyecz, R., Illes, B., and Banyai, A. (2018). Logistic aspects of industry 4.0', *IOP Conference Series: Materials Science and Engineering*, Vol. 448(1), pp. 1-012014.
- Tsiotas, D., (2021) “Drawing indicators of economic performance from network topology: the case of the interregional road transportation in Greece”, *Research in Transportation Economics*, 90: 101004.
- Tsiotas, D., Polyzos, S., (2018) “Effects in the network’s topology due to node aggregation: empirical evidence from the maritime transportation network in Greece”, *Physica A*, 491C, pp.71-88
- Tsiotas, D., Polyzos, S., (2018) “The complexity in the study of spatial networks: an epistemological approach”, *Networks and Spatial Economics*, 18(1), pp.1–32

- Tsiotas, D., Tselios, V., (2022) "Understanding the uneven spread of COVID-19 in the context of the global interconnected economy", *Scientific Reports*, 12: 666
- Winkelhaus, S. and Grosse, E.H. (2019). Logistics 4.0: A systematic review towards a new logistics system. *International Journal of Production Research*, DOI: 10.1080/00207543.2019.1612964.
- Xanthos, G., Ladas, Christos, Ap., & Genitsaropoulos, C. (2012). Regional Inequalities In Greece A Proposition For Their Depiction. *Regional Science Inquiry*, 4(2), 191-196.
- Xanthos, G., Ladas, Christos, Ap., & Genitsaropoulos, C. (2013). A method for forecasting population changes in alpine, semi-alpine and lowland communities of Epirus region in Greece. *Regional Science Inquiry Journal*, 1, 173-79
- Yao, X. (2018). Industry 4.0 in Logistics. Master's Degree thesis, Politecnico Di Torino, Italy. Yua, M. (2020). Impact of Industry 4.0 on inventory systems and optimization. <http://dx.doi.org/10.5772/intechopen.90077>.