

THE ASSESSMENT OF LOGISTICS SECTOR ROLE ON EU-27 ECONOMIC GROWTH DURING COVID-19 PANDEMIC

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Abstract. This study focuses on evaluation the role of logistics and transport industry on the economic growth of EU-27 during the COVID-19 pandemic. The evaluation found a positive correlation between government spending to transport infrastructure, employment level, and freight transportation by road, railway and economic growth. Regression analyses showed that in 2019 the impact of logistics industry and economic growth of EU-27 countries insignificant, and in 2020 – statistically significant between public expenditure, employment rate in EU-27 economies. This study also found that some variables, such as the length of rail freight and transportation by air did not have a significant impact on economic growth of EU-27 during pandemics.

Keywords: logistics sector, economic growth, COVID-19 pandemic.

JEL Classification: L80, L86.

Introduction

According to Loske (2020), the recent COVID-19 and other forms of epidemic and pandemic outbreaks usually have a severe effect on society especially in the area of economic activities.

In 2020, the COVID-19 pandemic caused a historically large economic contraction, with real GDP in the EU falling by 6.1%, higher than it did during the global financial crisis (European Commission, 2021). COVID-19 pandemic raised some problems in the EU-27 public finances. They have suffered significantly, and fiscal disparity between EU-27 Member States has grown. In all EU-27 Member States, the ratios of deficit and debt have increased. Over the following ten years, high debt ratios are anticipated to continue and rise above pre-pandemic levels. Numerous weaknesses that already existed have been made worse by the COVID-19 problem. The recession and actions taken to address the COVID-19 problem have led to an increase in internal imbalances caused by excessive levels of public and private debt. We may add, that COVID-19 pandemic shows a huge impact on every sector of the economy including the logistics and transportation segments (Loske, 2020).

Governments in many countries were able to impose a number of restrictions to limit the spread of the

COVID-19, including limitations on people's freedom of movement within the nation, particularly when there were no vital reasons to do otherwise, laws governing close proximity and physical contact, the use of face masks in public places, and the temporary closure of businesses and services. The COVID-19 pandemic introduced a significant development in the logistics and transportation industry, including the emergence of online retailers with effective delivery alternatives and the emergence of third-party logistics services as more businesses outsource supply chain management. According to Mouratidis and Papagiannakis (2021), innovative uses of various modes of transportation and cutting-edge technology, like App City, can alter travel patterns and have a favorable effect on the sustainability of the environment. Although teleworking and teleconferencing, which were implemented during the COVID-19 epidemic, have decreased the overall number of travels, a balanced and sensible use of transportation may result in an increase in the number of lengthy trips. According to Ho et al. (2021), researchers have been extensively examining the COVID-19's effects on numerous industries since the pandemic's outbreak. Due to the strong demand for commodities during the early stages of the outbreak, various production companies were put under a lot of pressure,

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and some studies have only focused on the negative effects of COVID-19 on the transportation sector. Ho et al. (2021) on the other hand said that despite the COVID-19 pandemic virus causing state economic instability and a rise in unexpected tendencies, it also created new chances for business. The expansion of e-commerce and electronic payments, changes in consumers' purchasing habits, and a strong demand for logistical services are some of the most recent changes. During COVID-19 pandemic various governments around the world implemented restrictions which have in turn affected the operations of economic activities, not leaving out the transportation and logistics industry of all European Nations. As a result, there is a tremendous need for logistics and transportation services due to the increased rate of movement of goods and consumables (Pranskuniene & Perkumiene, 2021).

The logistics industry is the oldest and the backbone of every economy. However, when there is stability and a smooth flow of economic activities, there is bound to development, and growth. Also, when the economy functions well there is high gross domestic product (GDP), consumption, investment (both public and private) that bring more jobs thus reducing unemployment rates and crime, tourism by bringing in visitors who end up spending in the economy, increased activities in international trade that brings a surplus and stability in the prices of products and a stable money supply.

The aim of the paper – to assess the importance of the logistics sector on the EU-27 countries economic growth during the COVID-19 pandemic. The following tasks are set to achieve the goal of the article: 1) to theoretically justify the importance of the logistics sector; 2) to assess the importance of the logistics sector in the EU-27 countries during the COVID-19 pandemic.

The study's findings will help us to also have an in-depth understanding of how the logistics industry functions and its benefits to the growth of our economy. It will also help us understand how the world has changed in recent years due to the outbreak of the COVID-19 pandemic and how this has affected the way business is conducted in a world of COVID-19. It will also create an insight into the various challenges faced by the logistics industry in an era of COVID-19.

The first part of the article analyzes the concept and importance of the logistics sector during the COVID-19 pandemic. The second part of the article presents the methodology for conducting the research. The third part of the article assesses the importance of the logistics sector in the EU-27 countries during the COVID-19 pandemic.

1. Logistics sector during the COVID-19 pandemic

The logistics industry has so far, exhibited great development in recent years globally and is the lifeblood of every economy because it involves movement of people and goods which requires a lot of care and handling.

According to Nguyen et al. (2021) logistic industry is the one important sector of global economics. Logistic activities are particularly important for manufacturing and trade sectors. Thanks to a sequence of logistical activities, manufacturing organizations are able to get raw materials, process those resources during production, and distribute their finished products to customers. Its use has grown recently, with more individuals considering it in some cases with a focus on transportation (Laszuk & Ryciuk, 2016).

The fundamental services of logistics industry include transportation, customs, storage, clearance, handling, insurance, packaging, stocks and inventory management customer relationship management and customer specific services (Lean et al., 2014; Zeng et al., 2020). Above mentioned services increased the significance of the logistics industry and thus, the industry became the sector with the highest share in services thereby contributing to economic growth (Hayaloglu, 2015).

The logistics industry is currently undergoing a transformative change. According to research and articles published by Obrenovic et al. (2020), Lugo-González et al. (2021), Okeleke and Aponjolosun (2020), Lee and Chen (2022), Xiang et al. (2021) and Samonte et al. (2022), the logistics industry is plagued by challenges of risk, variability, volatility, and disruption. The reasons for these are natural disasters, violence, noncompliance with government regulations, poor accountability, delayed information sharing for logistics, poor communication among partners, limited shared logistics capability and capacity utilization opportunities among service providers, managing inventory visibility across various logistics providers, theft and pilferages, and the need for segmented and customized services as demanded by customers.

As Sevgi and Tezcan (2017) states, the information flow in logistics industry is highly inefficient, error-prone, manual, non-digital, and heavily dependent on complex paper-based systems. There are many issues with the current supply chain, including its extremely poor speed, the constant risk of fraud and counterfeiting, and its lack of trustworthiness and data security. Logistics firms facilitate trade and commerce and help company get their products to customers as a vital part of value chains, both within and across international boundaries, which in turn influences the overall performance of the economy as a whole (Twinn et al., 2020).

The existing supply chain management system is outdated and unable to match the pace of changes happening across the globe. The speed of existing supply chain is extremely slow, risk of counterfeiting and fraud always exists, lack of trust, unreliability, and insecurity in data are major problems which have been observed.

Subramanya and Kermanshachi (2021) analyzed the impact of COVID-19 on the transportation industry with a comparative study of transportation modes such as road, air, and rail transportation. COVID-19 has severely affected all forms of transportation based on the supply and number of travel passengers. According to

Kim (2021), travels to major cities and bus transportation have declined about 50–90% globally and solutions to this problem have been addressed to some extent by the transportation sector of different nations, as some companies had limited production of vehicles to invest more in the production of safety materials.

A dropdown of about 10% in global capacity in 2020 has been recorded due to the global economic crisis (5%). As a result of the social distance, regulations had also significantly affected passenger traffic. However, with the possibility of the vaccination, the current ease of travel restrictions could result in a predictable 7% rebound in 2021. Luman et al. (2022) also noted that aviation and public transportation will take several years to recover from the impact of COVID-19; and with the remote work and travel regulation, the demand for aviation and public transportation would possibly remain below 2019 levels even after economies fully re-open. Another negative impact is on the increased freight costs incurred from state grants given to industries during the pandemic.

The immediate impact of the pandemic on the logistic sector has been a sharp fall in freight availability due to restrictions on production of non-essential goods, and shortage of fleet for movement of goods owing to death of drivers and consequent spike in truck rentals and air freight prices. It has experienced some setbacks in its operations such as the strict import and export restrictions, reduction in the demand for passengers' travels, changing the customer relationships situation of transportation companies during the COVID 19 pandemic (Karaman et al., 2020; Ho et al., 2021). A downturn in logistic activities has also resulted in emergency stock piling and mismanagement of vital resources and facilities, instability in market supply and demand, changes in consumer purchasing and consumption pattern, such as increased fears and declining investments (Ho et al., 2020).

Shopping has shifted from physical to online shopping with huge demand for express delivery services also putting tremendous pressure on more technological innovations to keep pace with changes in the transportation and logistics industry (Luman et al., 2022).

According to Mouratidis and Papagiannakis (2021), new opportunities utilizing various forms of mobility and intelligent technology, like App City, might influence travel behavior and have a favorable effect on the sustainability of the environment. Teleworking and teleconferencing, which were implemented during the COVID-19 epidemic, have been found to have decreased overall trips, yet sensible and balanced transportation utilization can increase the number of long trips. For instance, sharing automobiles, motorcycles, and bicycles can enable more active travel.

On the contrary, to Ho et al. (2021), there has been a significant amount of research on the COVID-19's effects on many industries among researchers since the pandemic's outbreak. For instance, Yu et al. (2020) looked into the labor industry, while Vidya and Prabheesh (2020) looked into the trade industry, Lee and Chen (2022) looked into

the tourism industry, and Mishra and Rampal (2020) looked into the medical industry. Additionally, there have been conflicting perceptions regarding the impact of COVID-19; some studies have only focused on the detrimental effects of COVID-19 on the transportation industry as a result of the high demand for goods during the early stages of the outbreak that several production companies were forced to meet.

Dabre (2020) in her research identified the following challenges faced by the logistics industry during the COVID-19 pandemic: acute capacity crunch, sourcing patterns, managing inventory, severe workforce shortage. Due to the continuous supply and demand volatility and decreasing revenues, several businesses resorted to layoffs as a cost-cutting tactic. Ocean carriers were unable to operate effectively due to a crew shortage, putting an increasing amount of stress on the staff who were fortunate enough to keep their jobs. There were more ships docked than in the water because maintaining carriers was challenging due to the crew on board and a lack of workers (Yang & Jianguo, 2011).

The process by which a country's wealth develops over time is known as economic growth. Growth is best characterized as a transformational process. The two elements that are most frequently mentioned as essential are entrepreneurship and investment (Sultan & Emrah, 2014).

Most economists concur those four factors - human resources, physical capital, natural resources, and technology - have an impact on economic development and growth. Governments in highly developed nations place a strong emphasis on the localities. Less developed nations, especially those with abundant natural resources, will fall behind if they do not support technological development and raise the level of education and skills of their workforce (Woodruff, 2019; Wang, 2010).

Logistics plays a huge role within today's economy. The most crucial elements that aid in our understanding of the rates of economic growth and development in various nations are the economic indicators specific to the target country. The economic, social, psychological, and cultural makeup of the nation is positively impacted by these indicators, even when they have favorable and high values. The culture, standard of living, and welfare of the people in the society all rise as a result of these consequences. One of the tools that is crucial in the modification and enhancement of economic indicators is logistics. The logistics sector contributes significantly to the overall health of the economy by generating jobs, money, and foreign inflows. On a smaller scale, the logistics sector is crucial for boosting a company's ability to compete. The logistics sector also plays a significant role in reviving and enhancing the competitiveness of other industries. Today, the logistics sector is essential to every industry.

Summarizing what was said above, the following theoretical model of logistics sector evaluation is formed (see Figure 1).

The figure show a relationship between economic growth and the logistics industry where variables/actors

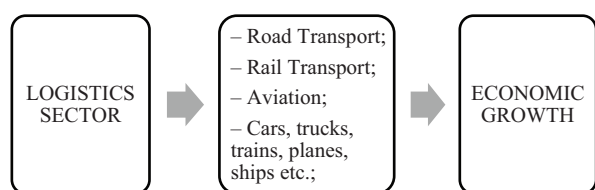


Figure 1. Conceptual framework of evaluation model (source: composed by the authors)

that make up the logistics sector are directly or indirectly involve in contributing growth to the economy given the nature of their activities and the role they play. For example, for road transport, it involves people moving from one place to another with the use of Vehicles or trains. For aviation, it can take people from one geographical area to another within the Country, out of the Country as well as continent. This brings about visitors and customer’s demands are increased.

2. Methodological approach

The purpose of research is to assess the current state of the research area and to determine the degree to which the logistics industry contributes to EU-27 countries economic growth during COVID-19 pandemic. Also, because it is a procedure of gathering information with a specific end goal to give expected results regarding the research under study (Mugenda & Mugenda, 2003).

The targeted population for this research was Europe Countries and the representative fraction of a population or a statistical set that was considered for analysis were EU-27 countries.

In order to produce a legitimate and dependable conclusion, this study was analyzed based on quantitative research methods of secondary data. This method also necessitates a keen awareness of the phenomenon in its context. The quantitative technique of research, focuses on the measurement and analysis of causal links between variables rather than processes, the cross.

Unbalanced panel data analysis is used to examine the impact of the logistics industry on these countries. Data for 2019–2020 was chosen as the time frame. In the study, the models were established using Public Expenditures of transport infrastructure, Employment rate, Freight transported by railroad (million ton-km), Length of railroads (total route-km) and Freight transported by airlines (million ton-km) to represent the logistics sector given that it directly or indirectly influences others. Statistical data utilized in the study were obtained from EU site and www.statista.com. Two econometric models were constructed for 2019 and 2020. Per capita GDP was accepted as the dependent variable.

The quantitative data: would be collected using the survey study, was collected from published information on websites and other related sources applicable (see Table 1).

The first limitation relates to the variables considered for the study which were Public expenditure,

Employment rate, Freight transported by railroad, Freight Transport by Air and Length of railroads. The second limitation had to do with the number of years taken into consideration which was only two years (2019 and 2020) since the study was centred around COVID-19 and data for 2021 was not available. The third limitation was the sources of data collected since it was secondary and cannot be altered or judge since it must be used in its formed gotten. This method is disadvantageous in that there is no opportunity to get first-hand data as well as current data as compared to another method like primary where information is gotten currently and from the mouth of the respondents.

Table 1. Variables included into the econometric model (source: composed by the authors)

Variable Name	Definition of variable	Sources
EG	Economic Growth	https://www.worldometers.info
GDP PC	GDP per Capita	https://www.statista.com
PEX	Public Expenditure on transport infrastructure	https://www.statista.com
EMP	Employment rate (%)	https://www.statista.com
FTR	Freight transported by railroad (million ton-km)	https://ec.europa.eu/eurostat
AFT	Freight Transport by Air	https://ec.europa.eu/eurostat
LTR	Length of railroads (total route)	https://unece.org/transport/transport-statistics

Two different econometric models were constructed. Per capita GDP was accepted as the dependent variable. The control variables that are determined to affect per capita GDP in economic theory were limited to Public Expenditures of transport infrastructure, Employment rate, Freight transported by railroad (million ton-km), Length of railroads (total route-km) and Freight transported by airlines (million ton-km) to represent the logistics sector.

The model was made up of variables considered to have a link with the economic growth Economic growth, GDP per capita, Public expenditure, Employment rate, Freight transported by railroad (million ton-km), Freight Transport by Air and Length of railroads (total route-km).

$$GDP\ PC = \beta_0 + \beta_1 PEX + \beta_2 EMP + \beta_3 FTR + \beta_4 AFT + \beta_5 LTR + e. \tag{1}$$

That is to say: Y – GDP PC (Economic growth); β_0 – constant; PEX – public expenditure; EMP – employment rate; FTR – freight transported by railroad; AFT – freight

Transport by Air; *LTR* – length of railroads (total route-km); $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ – beta coefficients indicating various levels of importance; *e* – stochastic term also known was the unexplained variable.

According to this formula will be evaluated logistic and transportation sector impact on EU-27 economic growth.

3. Research results and discussion

By descriptive analysis of the data (see Table 2), we can see that almost all EU-27 countries in 2019 recorded a decrease in Economic Growth. Looking at 2020, the situation was better given that there was a lot of diversification that gave an opportunity to minimize loses in almost all sectors including the logistics sector. This is probably because by this time, there was an increase in work from home that is why many of the EU-27 countries successfully closed the decreases in Economic growth.

From the Table 2 we can see the results in 2019 the percentage of the mean value of the logistics variables are a minimum of 3.4230 and a maximum of 74.3741 and the highest deviation from the results came from Air freight transportation 7.01925 with the lowest in public expenditure 1.26280. In 2020, it was public expenditure on transport infrastructure, freight transport and length of rail transport 0.00 and a maximum of 73.4185 with however giving a deviation 7.01925 all-time high and 1.37705 low. This therefore means that between 2019

and 2020 during the COVID-19 pandemic, the average contribution or impact economic growth was better off compared to 2019 in terms of employment rate but the levels of deviation remained quite stable.

Table 3 represents regression model of EU-27 economic growth impact factors from logistic sector in 2019.

Dependent Variable: Economic Growth $Y, Y_1 = 2019$. Based on Equation (1) presented in the methodological part:

$$Y_1 = 0.585 - 0.706PEX + 0.177EMP - 0.500FTR + 0.104LTR + 0.248AFT.$$

From the results above, indicate that GDP per capita a 0.585 increase leads to a one percent increase in Economic growth during the 2019 while every other variable is constant, also a reduction in public expenditure by 0.706 will lead to a one percent decrease in economic growth. Again, holding other factors constant, 0.177 increase in employment led to a one percent increase in economic growth, furthermore, a decrease of 0.500 in freight transport by rail led to a one percent decrease in economic growth. The length of rail determine how much it will cost passengers, the longer the length the higher the amount, results showed that a positive change in length of rail roads by 0.104 led to an increase in economic growth by one percent and an increase in Air freight transport by 0.248 led to a one percent increase in economic growth in during the COVID-19 pandemic in 2019.

Table 2. Logistics industry for both years during the COVID-19 period (source: composed by the authors)

Indicator	N	2019				2020			
		Minimum	Maximum	Mean	Std. Deviation	Minimum	Maximum	Mean	Std. Deviation
GDP per capita	27	1.00	11.91	3.7026	2.41327	1.06	12.26	3.7037	2.54145
Public expenditure	27	0.00	6.24	3.4230	1.26280	0.00	6.43	3.8363	1.37705
Employment rate	27	60.80	81.50	74.374	5.47769	58.30	80.80	73.418	5.65284
Freight trains rail	27	0.00	24.77	3.8465	6.37463	0.00	27.56	3.8465	6.76857
Length rail trans	27	0.00	19.67	3.7030	4.62191	0.00	19.67	3.7030	4.62191
Air Freight trans	27	0.07	32.10	3.7033	7.01925	0.07	32.10	3.7033	7.01925

Table 3. Regression model of EU-27 economic growth impact factors from logistic sector in 2019, coefficients^{a,b} (source: composed by the authors)

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	95.0% confidence interval for B	
	B	Std. Error	Beta			Lower bound	Upper bound
(Constant)	-12.731	14.467		-0.880	0.390	-43.011	17.549
GDP per capita	0.585	0.488	0.275	1.200	0.245	-0.436	1.606
PEX	-0.706	0.893	-0.174	-0.791	0.439	-2.576	1.163
EMP	0.177	0.204	0.189	0.869	0.396	-0.250	0.604
FTR	-0.500	0.365	-0.620	-1.367	0.188	-1.264	0.265
LTR	0.104	0.477	0.093	0.217	0.830	-0.895	1.103
AFT	0.248	0.316	0.339	0.784	0.443	-0.414	0.910

Table 4. Regression model of economic growth impact factors from logistic sector in 2020, coefficients^{a,b} (source: composed by the authors)

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	95.0% confidence interval for B	
	B	Std. Error	Beta			Lower bound	Upper bound
(Constant)	25.398	8.459		3.003	0.007	7.694	43.103
GDP per capita	0.234	0.253	0.125	0.926	0.366	-0.295	0.762
PEX	3.187	0.450	0.920	7.078	0.000	2.244	4.129
EMP	-0.341	0.120	-0.404	-2.839	0.010	-0.592	-0.090
FTR	0.061	0.189	0.087	0.325	0.749	-0.334	0.456
LTR	-0.343	0.248	-0.333	-1.383	0.183	-0.863	0.176
AFT	0.162	0.176	0.239	0.922	0.368	-0.206	0.530

Table 4 represents regression model of EU-27 economic growth impact factors from logistic sector in 2020.

Dependent Variable: Economic Growth Y, Y₂ = 2020. Based on Equation (1) presented in the methodological part:

$$Y_2 = 0.234 + 3.197PEX - 0.341EMP + 0.061FTR - 0.343LTR + 0.162AFT.$$

It was observed as follows, a 0.234 increase in GDP per capita holding other factors constant led to a one percent increase in economic growth. Looking at public expenditure, a 3.187 increase led to a one percent increase in economic growth in the EU-27 countries. Again, result indicated that a fall in employment by 0.341 leads to a one percent fall in economic growth, this is because we all know that when people are not employed, even their consumption drops, tax revenue falls, living standards fall and GDP per capita is affected. Considering Freight transport by rail, a 0.061 increase leads to a one percent increase in economic growth. The length of rail roads indicated that 0.343 decrease will lead to a corresponding one percent decrease in economic growth and air freight transport showed that a 0.162 increase leads to a one percent increase in economic growth. Finally looking at which variable was significant, public expenditure and employment rate affect economic growth where their p values are 0.00, 0.010 < 0.05 respectively.

Table 5 represents regression analysis of the contribution of transport infrastructure on Economic Growth.

From the above analysis, it was observed that a fall

in Freight Transport by rail leads to a corresponding decrease in Economic Growth where Beta (-0.069), looking at Length of rail roads in km which is supposed to add revenue to the sector, it showed that a reduction in the capacity of the length of railroads transport will lead to one percent fall in Economic Growth of EU-27 countries and also that an increase in airfreight transport by 0.686 will lead to a corresponding increase in Economic Growth of EU-27. The t-statistics are negative except for airfreight transport with 2.730 turning to a favourable direction.

Pairwise correlation and probability values for the variable used in the model estimates for logistics impact of economic growth in 2019 we can see the (see Table 6).

The result shows a positive correlation between GDP per capita and Economic growth, in terms of public expenditure showed an insignificant level though significant with GDP per capita, it was also observed that the length of air roads in km has a negative association with economic growth and insignificant as well. And in terms of air freight transport, there was a positive correlation though weak and insignificant. This shows that in terms of association in the year 2019, the logistic industry according to the above captured variables contributed but not much.

Pairwise correlation and probability values for the variable used in the model estimates for logistics impact of economic growth in 2020 we can see the (see Table 7).

From the results above It was observed that interactions of variables related to the model Economic growth such as Employment rate as a result of increase in

Table 5. Regression analysis the contribution of Transport on Economic Growth EU-27 (source: composed by the authors)

Model	Unstandardized coefficients		Standardized coefficients	T	Sig.	95.0% confidence interval for B	
	B	Std. Error	Beta			Lower bound	Upper bound
(Constant)	7.728	1.123		6.881	0.000	5.398	10.057
FTR	-0.069	0.163	-0.177	-0.421	0.678	-0.406	0.269
LTR	-0.355	0.186	-0.666	-1.901	0.070	-0.741	0.032
AFT	0.686	0.251	0.977	2.730	0.012	0.165	1.207

Note: a. Dependent Variable: GDP per Capita.

Table 6. Relationship between Economic Growth and Logistics industry during the COVID-19 in 2019, correlations^b (source: composed by the authors)

		Economic Growth	GDP per capita	PEX	EMP	FTR	LTR	AFT
Economic Growth	Pearson correlation	1						
	Sig. (2-tailed)							
GDP per capita	Pearson correlation	0.352	1					
	Sig. (2-tailed)	0.072						
PEX	Pearson correlation	-0.111	0.004	1				
	Sig. (2-tailed)	0.580	0.983					
EMP	Pearson correlation	0.183	0.182	0.311	1			
	Sig. (2-tailed)	0.362	0.364	0.115				
FTR	Pearson correlation	-0.205	0.086	-0.128	0.028	1		
	Sig. (2-tailed)	0.315	0.677	0.533	0.893			
LTR	Pearson correlation	-0.183	-0.024	-0.076	-0.074	0.859**	1	
	Sig. (2-tailed)	0.362	0.906	0.708	0.715	0.000		
AFT	Pearson correlation	0.021	0.292	-0.206	0.064	0.837**	0.778**	1
	Sig. (2-tailed)	0.918	0.140	0.302	0.751	0.000	0.000	

Note: **. Correlation is significant at the 0.01 level (2-tailed). N = 27.

 Table 7. Relationship between Economic Growth and Logistics industry during the COVID-19 in 2020, correlations^b (source: composed by the authors)

		Economic Growth	GDP per capita	PEX	EMP	FTR	LTR	AFT
Economic Growth	Pearson correlation	1						
	Sig. (2-tailed)							
GDP per capita	Pearson correlation	0.090	1					
	Sig. (2-tailed)	0.655						
PEX	Pearson correlation	0.765**	-0.063	1				
	Sig. (2-tailed)	0.000	0.755					
EMP	Pearson correlation	-0.053	0.154	0.300	1			
	Sig. (2-tailed)	0.792	0.442	0.129				
FTR	Pearson correlation	-0.168	0.094	-0.116	0.223	1		
	Sig. (2-tailed)	0.412	0.649	0.573	0.275			
LTR	Pearson correlation	-0.175	-0.043	-0.131	-0.068	0.807**	1	
	Sig. (2-tailed)	0.383	0.833	0.516	0.736	0.000		
AFT	Pearson correlation	-0.170	0.266	-0.251	0.058	0.832**	0.778**	1
	Sig. (2-tailed)	0.398	0.179	0.207	0.772	0.000	0.000	

Note: **. Correlation is significant at the 0.01 level (2-tailed). N = 27.

economic activities, freight transport by rail, length of rail roads in km which is assumed to have been a contributing factor and air freight transport meaning that an increase in these should be able to affect the Economic growth positively, showed a weak positive correlation between GDP per capita and Economic growth as well as insignificant, considering public expenditure, there was a positive correlation and significant that public expenditure influenced economic growth during the COVID-19 period in 2020.

In terms of employment rate during this period, showed a negative correlation and insignificant probably because during this period, some workers were laid off

and governments in different EU-27 adopted policies to limit the spread of the pandemic, freight transport by rail had a negative correlation and was insignificant and this could be as a result that traveling was limited as a result of policies adopted. Furthermore, the results indicated that the length of railroads had little to contribute given that once travelling is being restricted, the length cannot really generate much. And finally for air freight transport, there was a negative correlation and insignificant to economic growth. However, it is worth noting that the combined effect of these variables have a significant effect as shown below.

Conclusions

Some elements have been found to have had an impact on the operations of the industry as a result of the ongoing COVID-19 impact on the logistics sector. It was determined that the pandemic resulted in import and export activities restrictions, reduction in passengers' travels, and additional costs from demand for faster delivery services. The pandemic also affected consumers' purchase and consumption patterns leading to market instability in supply and demand and emergency storage of supplies and mismanagement of vital resources and facilities.

From the findings, it has been revealed changes in economic growth between the period 2019 when the pandemic started and 2020 when it was at its peak and a lot of deaths which hindered travelling. Looking at 2020, the situation was better given that was a lot of diversifications that gave an opportunity to minimize losses in almost all sectors including the logistics sector. This is probably because by this time, there was an increase in work from home that is why many of the EU-27 countries successfully closed the decreases in Economic growth.

Results from this methodological approach show that logistic competence has a positive and significant impact on public spending and employment rates, particularly in 2020, on economic growth in the EU-27 countries. Other variables, however, prove to be insignificant while having a positive and weak level of association. From the statistical point of view, the study concludes that there is a positive relationship between the Logistics Industry and Economic Growth of EU-27.

This study was carried out in different economies with diverse business activities and population as well as economic resources but with uniqueness in this area of logistics since every economy cannot function without a logistics sector. It was also established from this study that some variables such as Length of freight transport by rail have no significant influence on economic growth. Conclusively, there is a significant effect of the transport industry on economic growth of EU-27 countries. As a result, it is argued that the developments in the logistics industry in EU-27 countries is one of the most important contributors of economic growth.

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