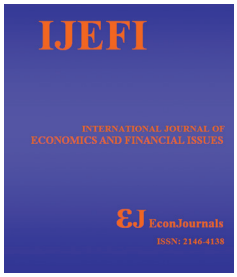

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The Impact of Developments in the Logistics Sector on Economic Growth: The Case of OECD Countries

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ABSTRACT

Logistic sector, which is considered as an important interface of increased international trade in consequence of globalization, plays an important role on countries' economic growth and development. A development in logistic sector facilitates the international trade, increases the competitiveness in countries and thus appears to be an important determinant of growth and development. In this study, the impact of developments in the logistic sector on economic growth has been investigated for 32 OECD countries covering the period 1994-2011. In this context, static panel data analysis was used. The findings obtained in the study, which used different variables as indicators of developments in the logistic sector, reveals that the relationship between developments in the logistic sector and economic growth differs depending on the indicator used.

Keywords: Logistic Sector, Economic Growth, Telecommunications, OECD Countries
JEL Classifications: L80, L86, O40

1. INTRODUCTION

With globalization, expansion of international trade volume has made essential for countries to improve their logistic capacity. As developments which are in logistic sector make ease production, distribution, and marketing, investments of countries in this field has provided a significant competitive advantage related global trade. An accurate and effective planning of logistics activities is an important way to get both cost and efficiency advantages for countries. Logistics has currently become essential element of trade by taking an active role in this development. Accordingly, developments in logistics sector have a considerable part providing the advantages in terms of growth and development.

Including the information flow, logistics includes a range of extensive activity which contains transformation and distribution from raw material source of goods to end market in which the goods are consumed (Rodrigue, 2012). According to the definition of Council of Supply Chain Management Professionals which is a capital global foundation in logistics network, logistics management is a process that is an active and productive planning, implementation, and controlling of good, labor, and related data in both direction flow and storage from starting point to consuming point (CSMP, 2013). From this aspect, logistics system is a topic related with organization of domestically movement and distribution of needful infrastructure and various flows (material, finance, informational, etc.) in a country (Navickas et al., 2011). In this sense, logistics investments include enterprises on some components such as various transportation networks, storage systems, information and communication devices, packing services, financial supply chain management, etc.

As well as economic outputs of logistics investments are quite a few, it has essentially important in terms of increasing of integration with trade and supply chain, better using of national transportation assets, creating increasing the employment opportunities besides providing low costs in more competitive imports and exports. While institutional infrastructure investments has currently remained not enough for load distribution, instead of this it is necessary that the investments should be made in a broader frame which includes logistics support activities (Rodrigue, 2012).

Key factor which is in logistics activities is transportation. So development of transportation infrastructure, in globalization process, has played a fundamental role in integration of countries with world economy. Cost and efficiency of transportation

services have gradually become important for all countries. Investments in this area have reduced cots, have ramped efficiency up, and have facilitated trade. Thus, access of market and local information has gotten easy and countries have taken an important competitiveness advantage. On the other hand, developments which represent another aspect of logistics activities in information and communication sector have provided important advantages to countries and companies reducing cost of information access. By this means, effect of substantial distances has disappeared, and search, information activities, promotion, sale, order and transportation services can be done easier and faster. It would be said that logistics sector assumes the leading role in growth and development of countries.

Although logistics sector is important, studies which search effect of logistics activities on economic growth are not enough in the related literature. When empirical researches which study importance of logistics sector are analyzed, it is pointed out that most of them are one-country studies which use time-series analysis. Also, it is seen that some research are predictions based on panel data which are at a level of regions and cities in a country. In spite of that, it is stood out that method of panel data analysis which includes multiple countries is used in limited number of studies. Another important point in studies in the literature, it is just focused on one specific aspect of logistics sector investments (transportation, storage, post, telecommunication, etc.). Accordingly, as proxy of logistics sector in studies, it is seen that indicators of transportation and telecommunication infrastructure are commonly used. Also, studies which discuss logistics investments multidimensional are very few. In this study which focuses on related inadequacies of the predecessor literature, the effect of developments in logistics sector on economic growth was researched for sample of OECD countries. In the study which was used panel data analysis, it was taken advantage of different variables just about proxy of developments in the logistics sector. Thus, it was studied to determine which development in areas of activity of logistics sector which grows fast will affect economic growth more. Also, it is anticipated that the findings would be directing in terms of growth and development politics of countries. It is thought that using of a wide variable range will make important contribution to the related literature.

The rest of the paper is organized in seven sections and they are designed as follows: relation between logistics and growth is located in the second part. Activities of logistics sector in OECD countries are discussed with various indicators in the third part. In the fourth part, data set are introduced and then descriptive statistics are located in the fifth part. Method and empirical findings are presented in the sixth part and finally the study finishes with conclusion and assessment.

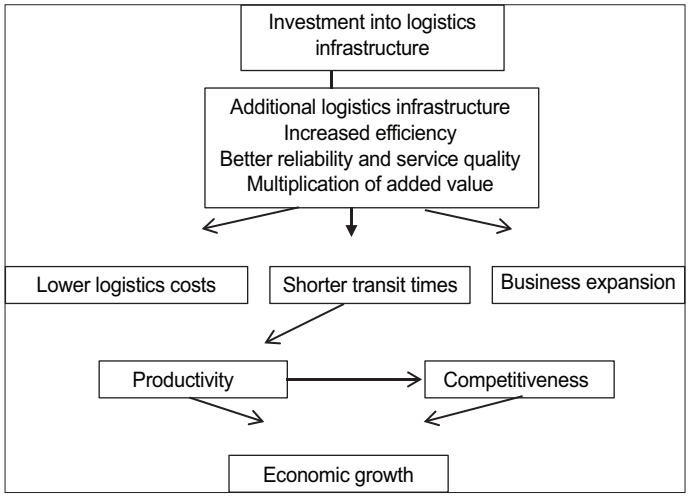
2. RELATION BETWEEN LOGISTICS AND ECONOMIC GROWTH

Developments in growing global economy and increased competitiveness make logistics a sector which has strategic importance. Accordingly, developments in logistics sector have become a propellant force related with growth of countries. Increasing investments in this area and forming of logistics networks has provided advantages for countries. Consequently, countries have currently increased their investments in this area and logistics sector has become prominent as a segment which grows rapidly.

Figure 1 demonstrates impact mechanism of logistic investments on economic growth. Accordingly, investments on logistics infrastructure have increased logistics capacity, has provided rise of efficiency, has improved the quality of service creating a secure domain, and has provided an increase in added value. So this situation has allowed low logistics costs, short transportation time, and creating of work enlargement opportunities. As a result, this process has increased efficiency and competitiveness force for countries and so it has allowed to economic growth.

When the literature is analyzed, it is pointed out that a great majority of the studies analyzed China origin. Mody and Wang (1997) studied various determinants of economic growth using the data were collected from 23 industry sectors which are located in seven coastal regions of China for a period between 1985 and 1989. It was discovered in that study that development in transportation and telecommunication facilities was leading of the growth. Demurger (2001) researched relation between infrastructure investments and economic growth for 24 provinces in China. In this study which contains years between 1985 and 1998, it is found that investments on transportation and telecommunication have positive significant impact on economic growth. Chu (2010) studied relation between logistics and economic growth in 30 provinces of China for a period between 1998 and 2007. In this study which was used generalized method of moments approach that is the one of the methods of dynamic panel data analysis, there was a positive significant relationship between investments of logistics sector (transportation, storage, mailing, and telecommunication) and growth. However, the contribution of logistic investments for growth is higher for interior undeveloped provinces in comparison to coastal provinces.

Figure 1: The impact of logistics on economic growth



Source: Navickas et al. (2011)

Wang (2010) analyzed the effect of logistics activities on regional economic growth for Anhui province in China. In this study, cargo turnover was used as a proxy of logistics activities and the findings showed that the effect of logistics activities on regional economic growth is uncertain. Cheng et al. (2010) investigated the effect of logistics sector on economic growth for Henan region in China in a period between 1978 and 2008, and they found that logistics sector has a significant role on economic growth. In Yuan and Kuang's (2010) study, the effect of developments in logistics sector on economic growth was studied for central, east, and west regions of China. The results showed that development of logistics sector has fundamental impacts on economic growth, however, there were differences among the regions. Accordingly, whereas logistics infrastructure has more important role on economic growth in more developed regions, its contribution to economic growth are fewer in less developed regions.

Hu et al. (2012) analyzed the relation between logistics infrastructure investments and regional economic growth for the central China region. In this study, the relationship between logistics investments, logistics value-added and gross domestic products (GDP) were investigated by the method of time-series analysis. According to the result of co-integration analysis, it was found that there are three co-integration relations among variables. As to the results of Granger causality analysis, it was seen that there was one-way causality from investment of logistic infrastructure to GDP and two-way causality between investment of logistic infrastructure and accretion value of logistics. Banerjee et al. (2012) studied the access of transportation network's impact on economic growth for various regions of China in a period between 1995 and 2010. The results of analysis demonstrated that the closeness to transportation networks has a moderate, significant, and causative impact on GDP. In the study, it is also found that the GDP per capita and income inequality were at higher levels in regions which were close to historical transportation networks, and also there were more companies in the regions, however, gains of the companies were higher.

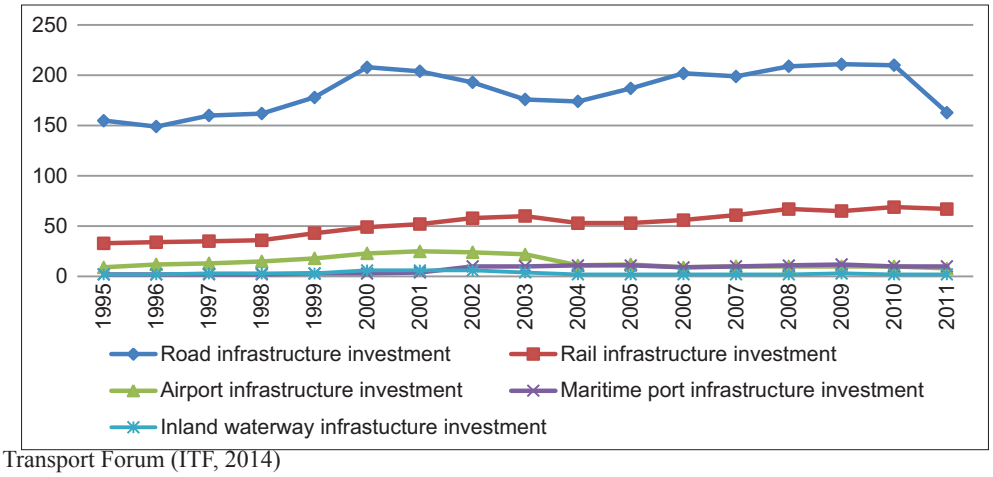
Boopen (2006) analyzed the relationship between transportation infrastructure and economic growth for two different country groups in the sample of Sub-Saharan Africa countries and developing countries. In this study cross-section and panel data analysis were used, it was found that transportation infrastructure make contribution to economic development of the countries for both sample groups. Berechman et al. (2006) analyzed the effect of transportation investments on economic growth for United States of America at a level of country, province, and municipality in a period between 1990 and 2000. At the same time, the researcher asserted that spillover effect of transportation investments in innermost regions are more in small geographical areas (at the level of municipality), and this effect decreased at the level of country and province. Egert et al. (2009) investigated relation between infrastructure investments (roads, motorways, railways, electricity, and telephone line) and economic growth for 24 OECD countries in a period between 1960 and 2005. According to the results of time-series analysis, infrastructure investments have a significant impact on economic growth. Also, cross-section analysis illustrated that infrastructure investments in telecommunication and electricity sectors had a strong positive impact on long-run growth.

Kayode et al. (2013) analyzed relation between investments of transportation infrastructure and economic growth for Nigeria in a period between 1997 and 2009. The findings demonstrated that the investments of transportation infrastructure had an insignificant role on determination of economic growth. Saatçioğlu and Karaca (2013) researched the effect of transportation infrastructure on differences of regional income for Turkey. Findings of the study in which cross-section regression analysis was performed by using of 26 region's data in 2006-2008, illustrated that transportation infrastructure had a positive effect on regional income level. Kuzu and Önder (2014) investigated long run relation between developments in logistics sector and economic growth in the sample of Turkey. In this study which transportation and index of storage turnover were used as a proxy of logistics sector's development, it is found that there was a long-run relationship among variables according to the analysis.

3. LOGISTICS SECTOR ACTIVITIES IN OECD COUNTRIES

The Graph 1 shows the investments of road, railway, airport, maritime port, and inland waterway for OECD countries in a

Graph 1: Investments of transportation infrastructure in OECD countries (1995-2011, Billion Euro)



Source: International Transport Forum (ITF, 2014)

period between 1995 and 2011. When the line graph is analyzed that the investments of road infrastracture for these countries are more in the related years. It is pointed out that the difference between second highest infrastracture investments which are railway and investments of road infrastracture is high. Between the related years, whereas the highest level of road investments is 210 billion Euro (in 2010), the highest level of railway investments is 69 billion Euro (in 2010). The investment levels of airport, maritime port, and inland waterway are quite low. Even if just a bit, airport investments showed an increase movement between 1998 and 2003, the investments decreased again after 2003, and it demonstrated stability like investments of maritime port, and inland waterway in the following years.

The Graph 2 illustrates the volume of freight progress via railway, road, and airline in OECD countries between 1995 and 2012. According to the Graph 2, a considerable part of freight transportation is carried out via railway and road in these countries. Whereas the proportion of road transportation was generally higher than the proportion of railway transportation since the beginning of 1990's (except 1991, 1992, 1998), the proportion of road transportation decreased after 2009. Contrary to this, the railway transportation showed an increase, and there is a shift from road transportation to railway transportation in terms of the freight transportation after 2011. It is pointed out that the freight transportation via airline is quite low and stable in OECD countries.

Graph 3 demonstrates value per 100 people related various telecommunication indicators which present the size of logistics sector in OECD countries between 2000 and 2013. Accordingly, while mobile cellular subscription (MCS) sharply increases in OECD countries from 2000 to 2007, the rate of increase continues slower and slower. Also, it is pointed out that telephone line subscription has a continuously decreasing curve between the same years. In this direction, as long as MCS increases, fixed-line using decreases. As it is seen in the Graph 3, internet users have a parallel curve like MCS. However, fixed broadband internet subscription (FBIS) has an increasing curve until 2009, and then the increase continues at inert levels in the following years.

4. DATA

Variables which are used in the analysis of relation between development of logistics sector and economic growth in OECD countries and resources of these variables are presented in Table 1.

Constant 2005 U.S. dollar-denominated real value of GDP variable which is discussed as a criterion of economic growth was used in the models and it was taken its logarithm.

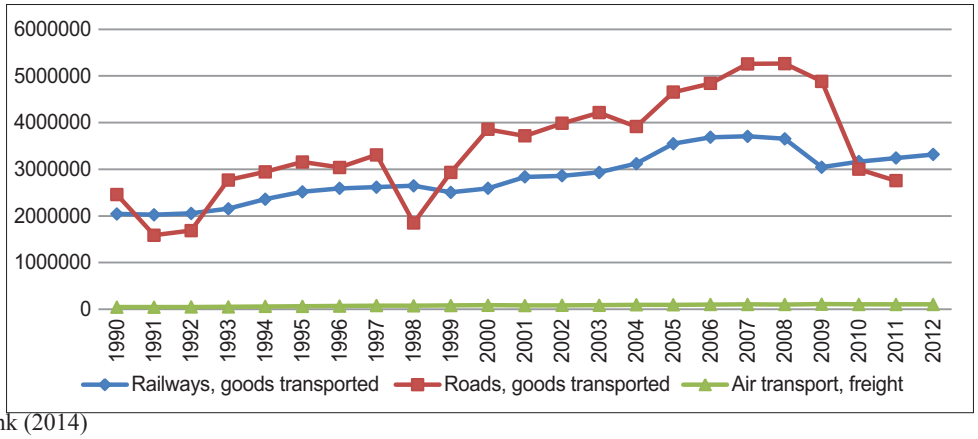
Total inland transport infrastracture investments which is used as a indicator of logistic sectors include total gross investments (new construction, extents, reconstruction, restoration, and major repair) which are funded for road, railway, inland waters, ports, and airports. In the analysis, converted into dollar values of euro-denominated variables obtained from International Transport Forum was used[1]. Railway transportation, road transportation and air transportation variables which are accepted as an indicator of logistics transportation aspects point out size of freight carried by railway; size of freight carried by road and size of cargo, express, and diplomatic bag carried by aircraft in billion-tones

1 The annual mean value of Euro/Dollar parity was used in the exchanging of the currencies.

Table 1: Variables used in the model

Variable name	Definition of variable	Sources
LGDP	GDP (gross domestic product)	World Bank
GFCE	General government final consumption expenditure (% of GDP)	World Bank
POP	Population	World Bank
SE	School enrollment, tertiary (% gross)	World Bank
EMP	Employment rate (%)	World Bank
LTINV	Total inland transport infrastructure investment	ITF
LRAIL	Railways, goods transported (million ton-km)	World Bank
LROAD	Roads, goods transported (million ton-km)	World Bank
LAIR	Air transport, freight (million ton-km)	World Bank
TEL	Telephone lines (per 100 people)	World Bank
MCS	Mobile cellular subscription (per 100 people)	World Bank
FBIS	Fixed broadband internet subscription (per 100 people)	World Bank
INT	Internet users (per 100 people)	World Bank

Graph 2: Transportation activities in OECD countries (1990-2012, million tone-km)



Source: The World Bank (2014)

km. It was taken logarirthm values of the variables. Four different telecommunication sector indicators are used to reflect another aspect of logistics. In this respect; the telephone lines variable illustrates the telephone lines per 100 people, the variable of MCS shows the number of mobile cellular subscriber per 100 people, the variable of FBIS demonstrates the number of fixed broadband internet subscriber per 100 people, and the variable of internet users illustrates the total number of internet users per 100 people.

On other hand, general government final consumption expenditure (GFCE) as a percentage of GDP, population, schooling rate of tertiary education, and employment rate in total population were added to the models as control variable. General GFCE as a percentage of GDP, has stated out growth rate of consumption expenditure of general government sector in GDP by percentage and years. The population variable has reflected total population. It was used in the model by taken its logarithm. Schooling rate of tertiary education has represented gross schooling rate in tertiary education. Finally, employment rate has pointed out rate of working age 15 and above population in total employment rate.

5. DESCRIPTIVE STATISTICS

Descriptive statistics related with the variables are presented in Table 2. The variables' minimum values, maximum values, means, and standard deviations are demonstrated in the Table 2. Accordingly, whereas the highest value of GDP variable which is used as a criterion of economic growth was 13846778425918.1 dollars in OECD countries between 1995 and 2011, the lowest value is 9842476302.04 dollars. It is seen that the lowest value of GFCE variable which is one of the control variables and shows rate of general GFCE in GDP is %10.22 and its highest value is %29.78. POP variable which points out size of population is 36850395.22 on an average between the related years. School enrollment (SE) variable which states schooling rate in tertiary education is %62.14 on an average between the related years. It's the lowest value is %9.81 on an average in Luxemburg (in 2000) and its the highest value is %113.98 in Greece (in 2011). While proportion of working age population in the total employment has the lowest value %40.9 between 1995 and 2011, their the highest value is %75.1.

Total inland transport infrastructure investments which is used as a proxy of developments in logistics sector are averagely 8012627781 in the countries included in the sample between 1995 and 2011. When it is reviewed the average transportation values, it points out that 147620.1 million tonnes-km transportations were carried out via road, 120524.8 million tonnes-km transportations were carried out via railway, and 3107.362 million tonnes-km transportations were carried out via airline. Wherere as the lowest value of TEL variable, which shows the number of telephone lines per 100 people and is used as a proxy of telecommunication sector which is logistics' another aspect, was 11.87, its highest value was 74.76 between the related years. On the other hand, the lowest value of MCS variable, which shows per 100 people MCS was 13.55 while its highest value, was 165.89. The lowest value of FBIS variable, which demonstrates FBIS per 100 people, was 0 (Turkey, Slovenia, Greece, Ireland, Luxemburg, and Poland) whereas its highest value was 38.98. The average value of INT variable, which illustrates internet users per 100 people, was 56.50 between the years. While its lowest value was in Turkey with 3.76 (in 2000), its highest value was in Iceland with 94.81 (in 2001).

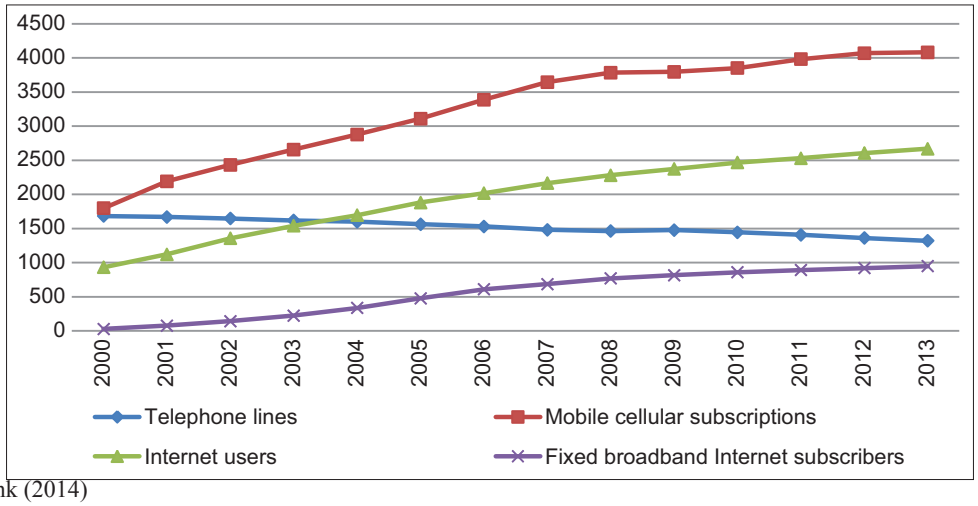
The correlation coefficients of the variables are presented in Table 3. As in the Table 3, it points out that there is a positive and generally high correlation between GDP levels and POP, SE, EMP, TINV, RAIL, ROAD, AIR, TEL, FBIS, and INT. Also, there is a negative correlation between GDP and GFC, MCS.

6. METHOD AND EMPIRICAL RESULTS

In the study, the impact of developments in logistics sector on economic growth was analyzed using panel data analysis for 32 OECD countries[2], except Chile and Israel, in the period of 1995-2011. It has been decided which one will be used from methods of fixed and random effects within panel data analysis according

2 The 32 OECD countries are; Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Korea Republic, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom and United States.

Graph 3: The telecommunication indicators in OECD countries (2000-2013)



Source: The World Bank (2014)

to the feature of the sample and the result of Hausman test. Both the characteristics of the country group studied in the study and the findings of Hausman test demonstrated that fixed effects model is the most suitable method for the study. The model used in the analysis is as following:

$$LGDP_{it} = \alpha_i + \lambda_t + \beta_1 GFCE_{it} + \beta_2 LPOP_{it} + \beta_3 SE_{it} + \beta_4 EMP_{it} + \beta_5 LOGIS_{it} + \varepsilon_{it} \quad (1)$$

i=1...., N; t=1...., T

Where; i is country, t is time, β is estimate coefficient, α_i is country fixed effect, λ_t is time constant, ε_{it} is error term, and L is related variables' logarithm. Also, LOGIS shows the variables which are used as proxy of developments in logistics sector. Eight different models were formed in the study in order to analyze the relation between developments in logistic sector and economic growth. As a proxy of logistics sector development, inland transport infrastructure investments were used in the first model, and afterwards other variables which are used as proxy of logistics sector developments besides infrastracture investments were analyzed separately in the following seven models. Accordingly, the variables which represent transportation activities were added to Model 2, 3, and 4, and the variables which represent telecommunication activities were added to Model 5, 6, 7, and 8. The analysis results belonging to the models summarize in Table 4.

According to the results of Model 1, there is a positive and statistically significant relationship between inland transport infrastructure investments and dependent variable at the %1 level. In other words, infrastructure investments have a positive impact on economic growth. The findings of control variables show that there is a positive and statistically significant relationship between population, schooling rate, employment rate and economic growth at the %1 level whereas there is a negative and statistically significant relationship between general GFCE and economic growth at the %1 level.

When the results of Model 2, 3, and 4 are reviewed, whereas there is a negative but insignificant relationship between railway transportation and economic growth at the %1 level, there is a positive and significant relationship between road transportation, airline transport and economic growth at the %1 level. According to the results of Model 5, 6, 7, and 8 in which telecommunication sector indicators were used, while the variables of MCS, FBIS, and internet users per 100 people were positive and statistically significant at the %1 level, the telephone lines variable was negative and statistically significant at the %1 level. These findings demonstrate that there is a positive relationship between MCS, FBIS, internet users and economic growth; a negative relationship between telephone lines per capita and economic growth. The findings related with control variables are same as in the Model 1.

Table 2: Descriptive statistics for study variables

Variable	Mean	Standard deviation	Minimum	Maximum
GDP	1124761744067.11	2334327576305.67	9842476302.04	13846778425918.1
GFCE	19.388	3.957	10.224	29.788
POP	36850395.22	57217490.06	281205	311582564
SE	62.145	18.193	9.814	113.983
EMP	55.923	6.810	40.9	75.1
TINV	8012627781	13901271818	28409166.77	82372361823
RAIL	120524.8	474475.9	79	2839124
ROAD	147620.1	322521.7	600	2086732
AIR	3107.362	6715.438	0	40617.74
TEL	46.33	13.41	11.87	74.76
MCS	91.985	27.847	13.552	165.890
FBIS	14.981	11.519	0	38.989
INT	56.508	23.185	3.761	94.819

GDP: Gross domestic products, GFCE: Government final consumption expenditure, SE: School enrollment, MCS: Mobile cellular subscription, FBIS: Fixed broadband internet subscription

Table 3: Correlation matrix for the variables

Variable	GDP	GFCE	POP	SE	EMP	TINV	RAIL	ROAD	AIR	TEL	MCS	FBIS	INT
GDP	1000												
GFCE	−0.111	1000											
POP	0.925	−0.282	1000										
SE	0.057	0.387	−0.088	1000									
EMP	0.197	−0.069	0.037	0.150	1000								
TINV	0.874	−0.072	0.819	0.041	0.176	1000							
RAIL	0.814	−0.169	0.721	0.111	0.186	0.502	1000						
ROAD	0.929	−0.178	0.893	0.064	0.096	0.726	0.919	1000					
AIR	0.950	−0.116	0.852	0.074	0.276	0.764	0.844	0.899	1000				
TEL	0.985	−0.156	0.942	0.037	0.143	0.820	0.849	0.952	0.954	1000			
MCS	−0.232	0.221	−0.340	0.310	0.089	−0.129	−0.234	−0.245	−0.231	−0.295	1000		
FBIS	0.044	0.141	−0.051	0.330	0.251	0.148	−0.089	−0.023	0.103	−0.007	0.658	1000	
INT	0.092	0.234	−0.076	0.429	0.439	0.153	0.012	0.015	0.164	0.023	0.639	0.839	1000

GDP: Gross domestic products, GFCE: Government final consumption expenditure, SE: School enrollment, MCS: Mobile cellular subscription, FBIS: Fixed broadband internet subscription

Table 4: Regression results

LGDP	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
GFCE	−0.013***	−0.017***	−0.012***	−0.012***	−0.015***	−0.019***	−0.017***	−0.020***
	(0.002)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	
LPOP	0.817***	0.672***	0.811***	0.763***	0.788***	0.683***	0.470***	0.530***
	(0.106)	(0.139)	(0.105)	(0.106)	(0.104)	(0.091)	(0.108)	(0.093)
SE	0.005***	0.005***	0.004***	0.005***	0.005***	0.003***	0.004***	0.003***
	(0.0003)	(0.0004)	(0.0004)	(0.0004)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
EMP	0.010***	0.012***	0.007***	0.011***	0.011***	0.008***	0.009***	0.009***
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
LTINV	0.071***	0.079***	0.075***	0.065***	0.065***	0.036***	0.059***	0.052***
	(0.006)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)
LRAIL		−0.012						
		(0.009)						
LROAD			0.067***					
			(0.015)					
LAIR				0.012***				
				(0.003)				
TEL					−0.002***			
					(0.0005)			
MCS						0.001***		
						(0.0001)		
FBIS							0.002***	
							(0.0003)	
INT								0.002***
								(0.0002)
Constant	10.884***	13.196***	10.439***	11.707***	11.588***	14.057***	16.991***	16.191***
	(1.674)	(2.228)	(1.672)	(1.679)	(1.644)	(1.458)	(1.748)	(1.499)
R^2	0.84	0.84	0.86	0.85	0.85	0.88	0.87	0.89
F test	313.83	211.80	273.62	265.13	277.15	378.80	320.70	386.58
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Number of obs.	327	327	327	327	327	327	327	327

***Statistical significances at the %1 level. Values in parentheses are t-statistics, the values in brackets refer to the level of significance. GFCE: Government final consumption expenditure, SE: School enrollment, MCS: Mobile cellular subscription, FBIS: Fixed broadband internet subscription

7. CONCLUSIONS

In this study, the impact of developments in logistic sector on economic growth was examined for 32 OECD countries in a period between 1995 and 2011. In the research which panel data analysis was used, the variables of inland transport infrastructure investments, railway transportation, road transportation, airline transport, telephone lines, MCS, FBIS, and internet users were used as proxy of development of logistics sector. The results show that the relationship between development of logistics sector and economic growth change depending upon the variable which is used. Accordingly, inland transport infrastructure investments are positive in all models which it is used in. In addition, whereas the coefficients of road transportation, airline transport, MCS, FBIS, and internet users variables are positive, the coefficient of telephone line variable is negative. There is no significant relationship between railway transportation and economic growth. According to the findings of this study in which different indicators of logistics sector are used, investments on transportation sector and developments in telecommunication and communication sectors make contribution on economic growth in OECD countries. While telecommunication and communication contribute to economic growth by the use of internet and mobile phones, fixed telephones decrease economic growth due to their limited use and inflexibility. Lastly, railway transportation has no impact on economic growth.

As a result, it is possible to state that the logistics sector development in OECD countries is one of the most important determinants of economic growth. Thus, policy implementations of governments which encourage investments in this area will affect positively economic growth. For instance, services which are provided by transportation infrastructure that represents an important aspect of logistics sector play an essential role on economic activities of countries. Whereas investments in this area decrease transportation costs, they facilitate trade by increasing mobility of goods and services. Similarly, developments in telecommunication sectors enable carrying out of search, information activities, promotion, selling, ordering, and transportation services easier and faster. Consequently, it is possible to suggest that developments of this sector in OECD countries expedite the growth and development process by providing important competition advantage.

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