THE MEDIATOR EFFECT OF FOREIGN DIRECT INVESTMENTS ON THE RELATION BETWEEN LOGISTICS PERFORMANCE AND ECONOMIC GROWTH

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ABSTRACT

Economic growth is a process of enhancement in total production level measured by absolute and relative increases or real production per capita. Economic growth is also related with development of production capacity. Recent researches consider Gross Domestic Product (GDP) as one of the indicators of growth. Logistics Performance Index (LPI) issued by World Bank is an indicator of logistics performance of a country consisting of six dimensions. Foreign Direct Investments involve establishing operations or acquiring tangible assets by a foreign firm for doing businesses in other country. In order to indicate the importance of logistics performance and capabilities, the paper investigates the mediator effect of Foreign Direct Investment (FDI) on the relation between Logistics Performance and Economic Growth. Research model is used to test above relationships through hierarchical regression method. As a result of analyses conducted, the mediator effect of FDI on the relation between LPI and GDP is found as statistically significant.

Keywords: Logistics, Gross Domestic Product, Foreign Direct Investment.

INTRODUCTION

Logistics performance has been a new phenomenon in explaining the relationship between 'foreign direct investment' (FDI) and economic growth (GDP). It has been gaining strength in an increasingly globalized world with the expansion of multinational corporations (MNCs). Under the globalization, capital now more freely flows around the world and seeks highest return. It looks for a location with well established logistics network infrastructure and processes (Dutta, 2009).

To capture more of those world FDI going around the globe, countries (especially the 'newly industrializing' - NICs - nowadays often called as 'emerging economies'), have been looking at themselves to improve their logistics capabilities (Ketels, 2008). They offer variety of incentives ('carrots') to close the gap of their economic growth and development. (Oxelheim, 1993).In this paper it is argued that countries' logistics performance plays a significantly important role both in 'foreign investments' and 'growth' of national economies.

LITERATURE REVIEW

Rapid changes in information and transportation technologies have created a global environment. Multinational corporations (MNCs) have introduced 'product diversification' (world trade has grown faster than world output) and divided 'production process' into various phases among countries, each 'specializing' in certain part of the manufacturing process in the so called 'global value chain' (GVC) (UNCTAD, 2013). This has had couple of effects. First, it has increased the trade flows 'inter-countries'. Two thirds of total world trade takes place amongst MNCs and around half of that takes place within the same multinational. Second, it has also increased FDI flows whose growth has outstripped the world trade figures twice as much (Bitzer, 2009). MNCs have been looking for best possible locations amongst the alternatives with suitable logistics infrastructure. Host countries (in need of investment for the improvement of their balance of payment positions and better quality of life) have also started to focus on their logistics capabilities and performance as an important tool to attract FDI.

Looking at the literature of the economics theory and the business trends, it is argued that investment decision is very much influenced by the logistics capabilities countries demonstrating (Khadaroo, 2010).

FDI itself triggers 'internal' as well as 'international' competition and productivity where local firms, once protected by strong national barriers, now face a strong competition from 'more efficient' foreign firms producing and marketing higher quality products (Schwab, 2015). Productivity gains are based on both 'horizontal' and 'vertical' spillover effects. Former implies companies within the same industry sector may or may not (with possible crowding out effect of local firms) benefit from increased productivity. Latter suggests that increased level of FDI fosters suppliers' (local firms) and customers' (foreign firms) interactions and helps local firms to gain know-how as a consequence. (Bitzer, 2009). In addition, recent empirical researches point out an existence of a significant spillover effect by diffusion of managerial skills and competence from foreign firms to local ones as well (Fu, 2012).

CONCEPTUAL FRAMEWORK

Logistics Performance Index (LPI) of World Bank has been referred as widely used indicator not only by the individual nations but also supra-national bodies such as European Commission (The World Bank, 2014). It has six dimensions namely customs, infrastructure, timeliness, international shipments, logistics competence (service quality), track and traceability where countries are listed against their score from the best performer to the least.

With regards to Foreign Direct Investment, World Bank database has been utilized. FDI inflows have been used to emphasize the flow from the point of view of host attractiveness to foreign investment on which this article is focusing.

As far as the growth perspective is concerned, GDP figures have been used to reflect total production realized within the national borders. It suits better to our subject matter as the good part of local production is now being realized by the 'fully own subsidiaries of multinational corporations' in each and every country. GNP, as an alternative measures, accounts on the basis of nationality and it would not reflect that 'foreign' production part in mind. Therefore, regularly published World Bank GDP data figures used for the subject matter of the article concerned.

RESEARCH METHOD

Main research question is to understand whether FDI has a mediator effect on the relation between LPI and GDP or not. In order to understand the mediator effect hierarchical regression method is used. This mediator variable analysis method was suggested by Baron and Kenny in 1986. It was used to designate the mediator role of Foreign Direct Investment (FDI) on the relation between Logistics Performance Index (LPI) and Gross Domestic Product (GDP). Accordingly LPI and FDI have direct influence on GDP individually (c and b). Additionally independent variable (LPI) has a direct influence on mediator variable (FDI) (a) (Çelebi, 2015).

Figure 1. shows the research model regarding the mediator effect of Foreign Direct Investment (FDI) on the relation between Logistics Performance Index (LPI) and Gross Domestic Product (GDP). The hypotheses of the research are shown in Table 1.
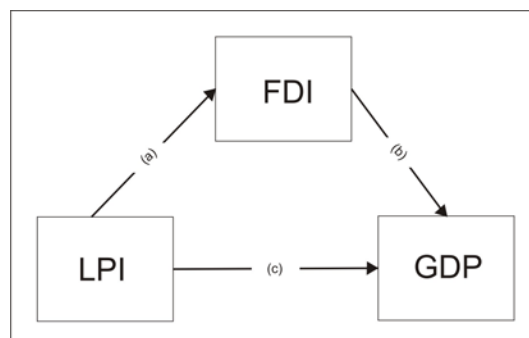

Figure 1: Research Model

Table 1: Summary of the Hypothesis

H1: FDI is positively influenced by LPI.
H2: GDP is positively influenced by FDI.
H3: GDP is positively influenced by LPI.
H4: FDI has mediator effect on the relation between LPI and GDP.

ANALYSIS RESULTS

Primarily relation among three variables was observed by means of the calculation of Pearson correlation coefficient. Table 2. shows that the correlation relations among variables are powerful and statistically significant.

Table 2. Correlation Coefficients

		LPI	FDI	GDP
LPI	Pearson Correlation	1	,460	,364
	Sig.		,000	,000
FDI	Pearson Correlation	,460	1	,837
	Sig.	,000		,000
GDP	Pearson Correlation	,364	,837	1
	Sig.	,000	,000	

Baron and Kenny suggested the existence of following conditions in order to prove a variable as mediator (Baron & Kenny, 1986):

1. Change in the independent variable cause the mediator variable to change,

2. Change in the mediator variable cause the dependent variable to change,

3. When the mediator and the independent variables are included to the analysis together, the influence of independent variable on dependent variable to decrease or completely disappear.

Hierarchical regression was used in order to test the model. Regression equations are as follows:

(a) $FDI = \beta_0 + \beta_1.LPI + \varepsilon$

(b) $GDP = \beta_0 + \beta_1.FDI + \varepsilon$

(c) $GDP = \beta_0 + \beta_1.LPI + \varepsilon$

(c') $GDP = \beta_0 + \beta_1.LPI + \beta_2.FDI + \varepsilon$

The results of the regression analysis are shown in the Tables 3,4 and 5.

Table 3. Model Summaries

Model	R	R^2	Adjusted R^2	Standard Error of the Estimate
(a)	,460	,211	,203	,892696643
(b)	,837	,700	,697	,550737509
(c)	,364	,133	,124	,936117314
(c')	,837	,700	,694	,553149270

As shown in Table 3, difference between R2 value of Model (c) and R2 value of Model (c') was found as 0,567.

Tablo 4. Anova Tables

	Model	Sum of Squares	df	Mean Square	F	Sig.
(a)	Regression	20,497	1	20,497	25,721	,000
	Residual	76,503	96	,797		
	Total	97,000	97			
(b)	Regression	67,882	1	67,882	223,803	,000
	Residual	29,118	96	,303		
	Total	97,000	97			
(c)	Regression	12,874	1	12,874	14,691	,000
	Residual	84,126	96	,876		
	Total	97,000	97			
(c')	Regression	67,932	2	33,966	111,010	,000
	Residual	29,068	95	,306		
	Total	97,000	97			

All the models are generally significant as shown in the Table 4. Coefficients of the models are as shown in Table 5.

Tablo 5. Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		β	Std. Error	β		
(a)	Constant	-5,436E-16	,090		,000	1,000
	LPI	,460	,091	,460	5,072	,000
(b)	Constant	2,425E-16	,056		,000	1,000
	FDI	,837	,056	,837	14,960	,000
(c)	Constant	-1,982E-16	,095		,000	1,000
	LPI	,364	,095	,364	3,833	,000
(c')	Constant	2,629E-16	,056		,000	1,000
	LPI	-,026	,063	-,026	-,406	,686
	FDI	,848	,063	,848	13,414	,000

As shown in Table 5, the change in the independent variable cause the mediator variable to change. The change in the mediator variable cause the dependent variable to change. After the mediator and the independent variables are included to the analysis together, the influence of independent variable on dependent variable to decrease.

According to these results, the entire hypotheses are accepted. Therefore the mediator effect of Foreign Direct Investment (FDI) on the relation between Logistics Performance Index (LPI) and Gross Domestic Product (GDP) is found as statistically significant.

CONCLUSION

In order to show the importance of logistics performance, in this paper the mediator effect of Foreign Direct Investment (FDI) on the relation between Logistics Performance and Economic Growth is investigated. It is argued that countries' logistics performance plays a significantly important role on growth of national economies. Research model is used to test above relationships through hierarchical regression method. As a result of analyses conducted, the mediator effect of FDI on the relation between LPI and GDP is found as statistically significant. And also, according to the results there is not direct relation between LPI and GDP. And, it is statistically confirmed that LPI has relation with GDP through Foreign Direct Investment.

In addition to above mentioned results, FDI has direct effect on GDP. Direct effect of LPI on GDP is statistically significant. But after including FDI to the analyses this direct effect was not observed. This means that FDI plays a mediator role between LPI and GDP. In the current literature, it is argued that logistics performance is an important determinant in increasing the level of economic growth. But before the economic growth foreign investments must be effected. Foreign investors consider logistics performance as important variable in their investment decisions. The countries with high logistics performance are more likely to attract foreign direct investment. As a result, the logistics performance largely affects economic growth through foreign direct investments.

REFERENCES

Baron, R., & Kenny, D. (1986). The Moderator - Mediator Variable distinction in Social Psychological Research: Conceptual, strategic and statistical Consideration . Journal of Personality and Social Psychology, 1173-1182.

Bitzer, Jürgen, Holger Görg. (2009). Foreign Direct Investment, Competition and Industry Performance, The World Economydoi: 10.1111/j.1467-9701.2008.01152.x Blackwell Publishing p 221.

ÇELEBİ, Ümit (2015). Hazırlanmakta olan Doktora Tezi, İstanbul Üniversitesi Sosyal Bilimler Enstitüsü, Avrupa Birliği Ana Bilim Dalı, ss.1-200.

Dutta, Nabamita and Sanjukta Roy. (2009). What Attracts Foreign Direct Investment: A Closer Look, Institute of Economic Affairs Volume 29 issue 3, p 81.

Ewing-Chow, Michael, Junianto James Losari and Melania Vilarasau Slade. (2014). The facilitation of trade by the rule of law: the cases of Singapore and ASEAN, Connecting to global markets, World Trade Organization chapter 9 p.133.

Fu, Xiaolan. (2012). Foreign Direct Investment and Managerial Knowledge Spillovers through the Diffusion of Management Practices, Journal of Management Studies, doi: 10.1111/j.1467-6486.2011.01036.x, p.2.

Ketels, Christian H. M. FDI. (2008). Location and Competitiveness Micro-economic Determinants of Location Competitiveness for MNEs, p 113

Khadaroo, A. J. and B. Seetanah. (2010). Transport Infrastructure and Foreign Direct Investment, Journal of International Development J. Int. Dev. 22, pp 103–123.

Oxelheim, Lars. (1993). The Global Race for Foreign Direct Investment p. 2 https://www.wto.org/english/thewto_e/minist_e/min99_e/english/book_e/stak_e_3.ht

Schwab, Klaus. (2015). Global Competitiveness Report 2014–2015, The World Economic Forum, p.7

Foreign Investment Advisory Service. (2001). "Turkey: A Diagnostic Study of the Foreign Direct Investment Environment", World Bank and the Treasury of Turkey, Ankara.

Foreign Investment Advisory Service (2001), "Turkey: Administrative Barriers to Investment", World Bank and the Treasury of Turkey, Ankara.

Trade Logistics in the Global Economy. (2014). The International Bank for Reconstruction and Development, The World Bank p iii

United Nations Conference on Trade and Development (UNCTAD). (2013). World investment report 2013: Global value chains: Investment and trade for development, New York and Geneva, United Nations.http://www.gatt.org/trastat_e.html