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THE RELATIONSHIP BETWEEN FOREIGN DIRECT INVESTMENTS AND ECONOMIC GROWTH IN TURKEY

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Abstract

Foreign direct investments (FDI) in Turkey expanded rapidly following the liberalization programme initiated in early 1980s. Turkey accomplished a record level in terms of its performance to attract FDI in post-2000 era. Foreign currency inflow, capital stock increase, employment generation, and technology transfer are among the benefits of FDI to host country. The most significant impact of FDI is contribution to host country's economy through realizing production. This empirical study explores the relationship between FDI and economic growth in Turkey using time series analysis for 1980-2015 period. Johansen Co-integration test results demonstrated a positive long-run relationship between economic growth and FDI, and the effect was found as statistically significant. According to Granger causality test findings, there is bidirectional causality between economic growth and FDI. The results of this study imply that a positive change in level of FDI is likely to increase the production of goods and services in Turkey.

Keywords: *Foreign Direct Investment, Economic Growth, Johansen Co-integration Test, Granger Causality Test*

TÜRKİYE'DE DOĞRUDAN YABANCI SERMAYE YATIRIMLARI İLE EKONOMİK BÜYÜME ARASINDAKİ İLİŞKİ

Öz

Türkiye'de doğrudan yabancı sermaye yatırımları (DYSY) 1980'li yılların başlarında başlatılan liberalleşme programı sonrasında hızla genişlemiştir. Türkiye, DYSY çekme performansı açısından 2000 sonrası dönemde rekor bir seviye yakalamıştır. Yabancı para girişi, sermaye stokunda artış, istihdam ve teknoloji transferi, DYSY'nin alıcı ülkeye sağladığı yararlardan bazılarıdır. DYSY'nin alıcı ülkenin ekonomisine en önemli etkisi, üretim gerçekleştirme yolu ile sağladığı katkıdır. Bu ampirik çalışma 1980-2015 periyodunda, DYSY ile ekonomik büyüme arasındaki ilişkiyi zaman serisi analizi ile araştırmaktadır. Johansen Eş-bütünleşme testi sonuçları, ekonomik büyüme ile FDI arasında pozitif uzun dönem ilişki olduğunu göstermiş ve etki istatistiksel olarak anlamlı bulunmuştur. Granger nedensellik testi bulgularına göre, DYSY ile ekonomik büyüme arasında karşılıklı bir ilişki bulunmaktadır. Bu çalışmanın sonuçları, Türkiye'de DYSY'deki pozitif bir değişimin, mal ve hizmetlerin üretimi artışını desteklediğini göstermektedir.

Anahtar Kelimeler: *Doğrudan Yabancı Sermaye Yatırımı, Ekonomik Büyüme, Johansen Eş-bütünleşme Testi, Granger Nedensellik Testi*

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1. Introduction

International capital flows have accelerated over the past decades and countries have increased their international trade relationship with the rapid globalization trend. Foreign direct investment (FDI) is a type of international capital flows from a foreign country that invests in the productive capacity of the host country. FDI can be defined as investment of the foreign investor or parent enterprise including a long-term relationship with a substantial influence on the management by transferring of technology, knowledge, skills, expertise, and other intangible advantages to the recipient country for the purpose of production (Shawa, 2014: 112).

FDI has been considered to have significant impacts on the economy of the host country such as raise in productivity, increase in capital stock, offering new jobs and generating employment, technology and know-how transfer. It also has impacts on new processes in the local market, and positive effect on the balance of payments, prices and general welfare. Therefore, both developing and developed countries try to attract more FDI (Seyidoğlu, 2003: 729; Alfaro et al., 2004: 22). On the contrary, it may cause unfavorable effects on the economy such as increasing control of the foreign investors on the economy which can discourage the domestic companies to take place in the market. Eventually, it may also cause reduction in the growth of domestic companies, and deterioration in economic integrity by using high technology in some part of the industry while using low technology in some other parts in the industry, cancellations in custom tariffs and import quotas, unfair competition for small sized domestic companies (Seyidoğlu, 2003: 730).

There has been a debate about the role of FDI on raising the host country's economic growth. This debate is two-fold; on the one hand, FDI provides know-how and technology transfer and raise in the productivity and employment, and on the other hand, it may cause unfavorable conditions for a part of domestic companies. The empirical findings are also not unique; some researchers find a positive relationship between FDI inflows and economic growth, while some other researchers find no linkage between them or a negative relationship. Under these circumstances, this paper aims to investigate the FDI inflows and economic growth relationship for the case of Turkey for the post-liberalization period by using time series techniques and applying Johansen co-integration and Granger causality analyses. Besides the main aim of focusing the FDI-growth relationship, the study also explores the impacts of foreign trade and domestic investments on economic growth. In the following part of the introduction, the trend of FDI inflows to Turkey is presented. In the second part, theoretical and empirical literature review is presented. The third part is the data and methodology section. In the last section, the findings of the study are discussed.

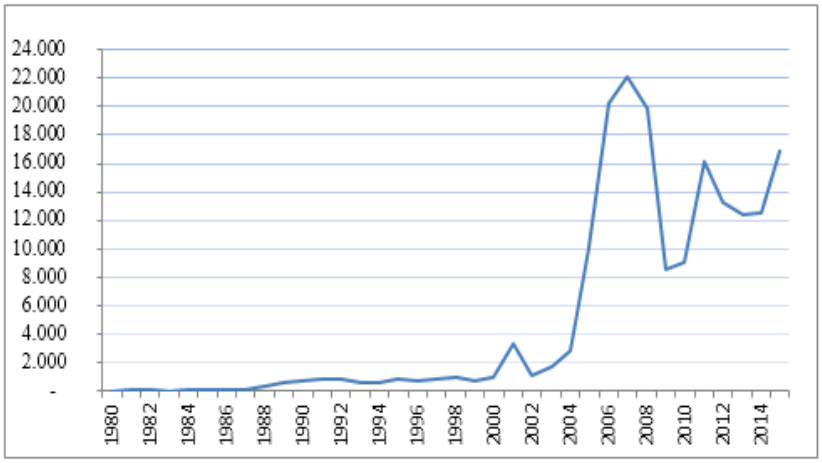
2. FDI Inflows to Turkey

FDI inflows to Turkey prior to 1980 remained at very low levels because of the economic policies restricting FDI and trade such as high tariff rates, quantitative restriction, rationing exchange rates and overvalued exchange rates. After the process of liberalization starting in 1980, trade liberalization and financial openness

proceeded well after 1987. Turkey then introduced economic reforms for encouragement of FDI and trade, such as removing trade restrictions, foreign exchange market liberalization (Ilgun et al., 2010: 45) and the change in the policy from the import substitution strategy to a more outward oriented economy. As a result, export development provided higher interest of foreign investors in Turkey.

After a period of slow growth lasting until 2000, Turkey experienced a significant increase in FDI inflows in post 2000 era which peaked at USD 22 billion in 2007. FDI inflows to Turkey accelerated thanks to economic and political stability, Europe Union (EU) membership negotiation process which started for Turkey in 2005 (Sayek, 2007: 105).Moreover, the structural and legal arrangements by the government to provide incentives for foreign investors mostly in terms of privatizations provided this rapid growth in FDI inflows to Turkey (Ilgun et al, 2010: 46). FDI inflows to Turkey peaked in 2007 by reaching USD 22 billion. Despite the decline by 10% due to the global crisis, FDI inflows to Turkey were still at a high level with USD 19.85 billion in 2008. As occurred in the global arena, Turkey also had decreases in FDI inflows during the global crisis period. After consecutive recovery seen during 2010-2011, there was decrease during 2012-2013 period again. Then, FDI inflows to Turkey reached a level of USD 16.82 billion with a rapid growth of 34% in 2015. FDI inflows to Turkey over 1980 to 2015 period are shown in Figure 1. The number of companies with foreign capital operating in Turkey reached from 5,328 in 2000 to 46,800 in 2015.

Figure 1: FDI Inflows to Turkey (1980-2015) (Million USD)



Source: Central Bank of Republic of Turkey (CBRT) database.

3. Literature Review

In the theoretical studies, the reason for positive relationship between FDI and economic growth is explained through two ways. 'Capital formation theory' is the first one which means that the increase in capital stock raises production and growth rate (Solow, 1956), and the second is 'technological spillovers' which refers technology and knowledge transfer role of FDI (Borensztein et al., 1998: 117). The positive effect

of FDI inflows on growth is discussed to be depended on some factors like human capital, trade openness level, and country's per capita income level (Herzer et al., 2008: 796).

There are many empirical studies conducted to explore the relationship between FDI on economic growth, and the impact of FDI on economic growth.

In the studies using panel data with many developing and developed countries, a significant and positive effect of FDI on countries' economic growth was found (Balasubramanyam et al., 1996: 92; Mello, 1999: 133; Bosworth and Collins, 1999: 35; Nair-Richert and Weinhold, 2001: 153; Hansen and Rand, 2006: 21; Bhattari and Ghatak, 2010: 1; Erçakar and Yılgör, 2010: 31). In another panel data study, the impact of FDI was found to be positive based on existence of minimum amount of capital at host country (Xu, 2000: 477). In another comparative study using Granger causality test, one-way relationship from FDI to growth was found in most countries (Ericson and Irandoust, 2001:1). In a panel data study with middle and low income countries, a positive relationship for middle income countries was found while for low income countries a statistically significant relationship was not found (Assanie and Singleton, 2002). Another panel data study showed a positive relationship between FDI and economic growth by concluding that the causality effect from FDI to growth is weaker than the causality from growth to FDI (Choe, 2003: 44). It was found out that consequence of FDI varies depending on country of origin and also the characteristics of the recipient country (Fortainer, 2007: 41). On the other hand, finding of a panel study for developed countries is that when the trade openness levels of the foreign and host countries differ, FDI does not have a significant impact on economic growth (Carkovic and Levine, 2002: 195).

In a more recent study including 104 countries and conducted for a time period of 1996-2015, a positive relationship between FDI and economic growth was found. One important finding of this study was the result that FDI's impact on growth changes depending on the change of the natural resource sector of the host country; the positive effect of FDI decreases after a certain expansion in natural resources sector, and beyond, it causes a negative impact on growth (Hayat, 2018; 283). In another recent study conducted for India and its neighbor countries Pakistan, Nepal, Bangladesh and Sri Lanka and found out that FDI enhances economic growth in all the cases included in the study (Sengupta and Puri, 2918; 1). FDI and economic growth relationship was explored for BRICS countries for the period of 1981 to 2018, and the findings for short run dynamics were positive relationship between FDI and growth for all the countries, while long-run findings were mixed. For India, and China and South Africa a unidirectional relationship was found from economic growth to FDI. For Brazil and Russia, a unidirectional causality was found from FDI to growth (Bani-Mustafa et al., 2020; 15-16).

In the studies conducted for one country to investigate the FDI and GDP relationship, a bidirectional relationship between them was found for Sri Lanka (Balamurali and Bogahawatte, 2004: 37) and Nigeria (Umoh et al., 2012: 53) cases and positive effect of FDI on economic growth was found for Ghana case (Antwi et

al., 2013: 18), while no impact of FDI was found on economic growth in Pakistan (Falki, 2009: 110) and in Nigeria (Umeora, 2013: 1) cases.

In the studies for the case of Turkey, a positive relationship was found for the period of 1996 to 2006 using quarterly data (Örnek, 2008: 199), a positive impact of FDI on economic growth and total factor productivities for the period of 1960 to 2005 (Arısoy, 2012: 17). In another study for two periods of 1970 to 2002 and 2002 to 2008, bidirectional causality was found between FDI and economic growth for the second period, while unidirectional causality from growth to FDI in the first period (Kahramanoğlu, 2009). On the other hand, in some other causality studies conducted for Turkey case, a significant relationship was not found between FDI and economic growth (Aslanoğlu, 2002: 31; Alagöz et al., 2008: 79; Alıcı and Ucal, 2003: 1).

Although there are more studies with positive linkage findings between FDI inflows and economic growth compared to studies which found no relationship between them, the empirical literature results are mixed for both panel data studies and for Turkey. This study aims to find out the relationship between FDI inflows and economic growth in Turkey. Time-series analysis is used for the period of 1980-2015, and Johansen Co-integration test and Granger causality test were conducted. Johansen Co-integration test results demonstrated a positive long-run relationship between FDI inflows and economic growth in Turkey and Granger causality analysis findings showed bidirectional causality between them.

4. Method

In the study, time series techniques were used to explore the relationship between FDI inflows and economic growth in Turkey by using 1980-2015 data. OLS regression was done with the dependent variable as Gross Domestic Product (GDP). The independent variables were FDI inflows, foreign trade (FT) which is sum of export and imports, and domestic investments (DI). The data used in the study are the annual data at current prices for GDP representing economic growth, total net FDI inflows, FT, and DI for the period of 1980-2015 using 36 observations for all of the variables in order to explore co-integration relationship between the variables of GDP and FDI in the long run. The data was drawn from Turkish Statistical Institute (TURKSTAT) database for GDP and FT, CBRT database for FDI, and Ministry of Development database for DI. Equation (1) is the regression equation between GDP and other receivables.

$$GDP = \beta_0 + \beta_1 FDI + \beta_2 FT + \beta_3 DI + u \quad (1)$$

where β_0 is constant, β_1, β_2, and β_3 are coefficients of regression. Coefficients' expected signs are as follows; $\beta_1>0$, $\beta_2>0$, $\beta_3>0$. In the equation, u is normally distributed error term. After Augmented Dickey Fuller (ADF) unit root test conducted whether have a unit root or not, Johansen co-integration test was done. Lastly to find out the causality between the variables, Granger causality test was conducted.

5. Results and Discussion

Descriptive statistics of the variables and descriptive statistics of the variables in logarithms were calculated (Table 1). For the purpose of stabilize the variance of series in the empirical analysis, logarithms of all variables were calculated and written by L preceding each of the respective variables name.

Table 1: Descriptive Statistics of the Variables (USD Million) and Variables in Logarithms

Variables	Mean	Standard Deviation	Variables in Logarithms	Mean	Standard Deviation
GDP	341,842	254,952	LGDP	12.46	0.78
FDI	5,011	6,982	LFDI	7.09	1.99
FT	131,347	134,704	LFT	11.19	1.16
DI	71,295	52,418	LDI	10.9	0.78

Note: Variables stated in logarithms are represented by L preceding the respective variables name.

For ADF test, the null hypotheses are that all variables LGDP, LFDI, LFT and LDI have a unit root; accordingly, the alternative hypotheses are that none of the variables has a unit root. According to ADF test results, the t-statistics and p-values yielded that LGDP, LFDI, LFT and LDI have a unit root, because the null hypothesis was not rejected at 5% significance level since it is within the acceptance interval (5% critical value: -2.948). The series with a unit root is considered as non-stationary. Hence, all variables were said to be non-stationary. With non-stationary variables, a regression can be reached with high R^2 (goodness of fit) and statistically significant coefficients, while the series are unrelated (Granger and Newbold, 1974: 111). Therefore, the first difference or greater differencing should be taken due to eradicate the unit root. Through ADF unit root test, it can be found whether the series are stationary or unstationary. The first differences of logarithms of the variables were represented as DL before the variables name. The null hypotheses that the variables have a unit root were rejected for all of the four series (5% critical value: -2.951), the variables became stationary at their first differences, thus integrated in order one (Table 2).

Table 2: ADF Unit Root Test Results for Variables at Levels and at the First Differences

Variables	ADF Test Statistic	p-value for t-statistic	Decision	Variables	ADF test Statistic	p-value for t-statistic	Decision
LGDP	-0.578	0.863	Not Rejected	DLGDP	-5.570*	0.000	Rejected
LFDI	1.723	0.411	Not Rejected	DLFDI	-7.234*	0.000	Rejected
LFT	0.978	0.750	Not Rejected	DLFT	-6.253*	0.000	Rejected
LDI	-0.859	0.789	Not Rejected	DLDI	5.971*	0.000	Rejected

Note: *Statistically significant at 5% significance level.

Co-integration refers that more than one series variable have a common stochastic trend and explains for time-series variables that they have long run relationship and do not have a trend of moving far away from each other (Johansen, 1988: 235; Dickey et al., 1991: 58).Johansen co-integration test was conducted to find whether the variables LGDP, LFDI, LFT, and LDI are co-integrated or not. According to Johansen co-integration test results for these four variables, the trace statistics was smaller than the 5% critical value for rank of zero and the maximum eigenvalue statistics was greater than the critical value of 5% for rank of zero which means trace test showed no co-integrating equations at 5% level, while maximum eigenvalue test indicated there is co-integration. Thus, the null hypothesis of 'there is no co-integration' was rejected. In general, there is no contradiction between the trace statistic result and maximum eigenvalue statistics result, however, in case of contradiction; maximum eigenvalue result is preferred due to providing more precise results. Accordingly, the findings demonstrated a long run relationship among these four variables (Table 3).

Table 3: Johansen Co-ntegration Test Results for LGDP, LFDI, LFT, LDI

Hypothesized Number of CE(s)	Trace Statistics	5% Critical Value	Prob*	Max Eigenvalue Statistics	5% Critical Value	Prob*
None(r=0)	46.425	47.856	0.068	28.636	27.584	0.037
At most 1(r≤1)	17.789	29.797	0.582	9.189	23.132	0.817
At most 2(r≤2)	8.599	15.495	0.404	8.107	14.265	0.368
At most 3(r≤3)	0.493	3.841	0.483	0.493	3.841	0.483

Note: *MacKinnon-Haug-Michelis (1999) p-values.

For the main purpose of this study, FDI and GDP relationship, it was concluded that any short-term fluctuations between the time series of GDP and FDI lead to a stable positive long run relationship. The long run equation between GDP and other variables is indicated in equation (2).

$$LGDP = 5{,}2991 + 0{,}1665*LFDI + 0{,}1342*LFT + 0{,}41*LDI \quad (2)$$

After finding a stable positive long run relationship between LGDP and LFDI, variance decomposition analysis was done to interpret each of variable's contribution to the other. Variance decomposition results for LGDP and LFDI for ten periods showed that as of 10th period, LFDI can explain 51.45% of the change in LGDP while LGDP can explain 39.24% of the change in LFDI (Table 4). Based on this result, it is concluded that the changes in FDI are a more important source of changes in GDP compared to the changes in FDI resulted from the changes in GDP.

Table 4: Variance Decomposition Results for LGDP and LFDI

Period	Variance Decomposition of LGDP			Variance Decomposition of LFDI		
	S.E.	LGDP	LFDI	S.E.	LFDI	LGDP
1	0.13	100.00	0.00	0.49	89.07	10.93
2	0.17	88.91	11.09	0.67	69.67	30.33
3	0.23	71.64	28.36	0.79	65.33	34.67
4	0.28	63.04	36.96	0.89	64.10	35.90
5	0.33	58.03	41.97	0.99	62.99	37.01
6	0.37	54.66	45.34	1.09	62.21	37.79
7	0.41	52.36	47.64	1.17	61.70	38.30
8	0.45	50.72	49.28	1.25	61.31	38.69
9	0.48	49.49	50.51	1.32	61.00	38.99
10	0.51	48.55	51.45	1.39	60.76	39.24

If there is co-integration between the series, there must be Granger causality in this relationship in one direction or both directions (Granger, 1988). In the FDI and economic relationship, in order to examine the direction, the Granger causality analysis was conducted for LGDP and LFDI as the next step. In Granger causality test, the causality is found by examining the significance of the F-statistic (Dickey et al., 1991: 58). The findings of Granger causality tests conducted for LGDP and LFDI showed that the null hypotheses were rejected since the probability values were lower than 5% and the F-statistics are statistically meaningful for both cases (Table 5).

Table 5:Granger Causality Test Results for LGDP and LFDI

H_0 Hypothesis	F-Statistic	Prob.	Decision
LGDP does not Granger cause LFDI	8.16431	0.0074	Rejected
LFDI does not Granger cause LGDP	8.17849	0.0074	Rejected

Hence, LGDP Granger causes LFDI just as LFDI Granger causes LGDP at 5% significance level. Based on these results, it was concluded that there is bidirectional causality between FDI inflows and economic growth. These findings are compatible with the empirical literature in which bidirectional causality was reported between FDI and economic growth. Granger causality for other variables, LGDP and LFT, LGDP and LDI, were also done. Results of pairwise Granger causality tests for other variables showed that there is a one-way Granger causality from LFT to LGDP and there is a one-way causality from LGDP to LDI, since those probabilities were lower than 5%. The null hypotheses that 'LFT does not Granger cause LGDP', and 'LGDP does not Granger cause LDI' were rejected accordingly.

6. Conclusion

FDI is one of the most important factors in international economic integration and refers to at least ten percent of the company shareholding in a domestic firm undertakes an investment is a foreign country. FDI is the investment made by a company outside its home country and it is the flow of long-term capital based on long term profit consideration involved in international production. FDI is considered as a vital factor in long-term economic development of developing countries thanks to its several benefits to host country such as raising productivity, enhancing job opportunities, transfer of know-how and technology and enhancing exports. FDI inflows to Turkey expanded in early 1980s after the liberalization programme, and rapidly grew in post 2000 era and reached the top in its history in 2007. According to the data by UNCTAD, Turkey became the 20th top host economies for FDI inflows in 2015 rising from 22nd from 2014. In this study, the relationship between FDI inflows and economic growth in Turkey for the period of 1980-2015 was explored through time-series analysis. Johansen co-integration test results demonstrated a positive long-run relationship between the variables and the effect was found to be significant. Variance decomposition results showed that the changes in FDI are an important source of GDP, while the changes in FDI resulted from the changes in GDP was found to be lower than that. And Granger causality stated that there is a two-way causality between FDI and GDP. Hence, the results of this study showed that there is a positive long-run bidirectional relationship between FDI inflows and economic growth, thus, a positive change in the level of FDI inflows is expected to increase the production of goods and services in Turkey. The results of the study are compatible with the theoretical and empirical literature. The findings of the study on the relationship between FDI inflows and economic growth in Turkey indicate that FDI plays a major role in inflows in the growth of the Turkish economy, thus attracting more FDI inflows is important to support the economic growth in the long run. In order to attract more FDI inflows, it is needed to consider making structural reforms in various sectors, enhancing the investment environment for the foreign investors by infrastructure developments, and training for improving labor skills.

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