

Foreign Direct Investment and Economic Growth: A Time Series Analysis of Turkey, 1979-2011

Eyup DOĞAN

Clemson University, the J.E. Walker Department of Economics, USA, edogan@clemson.edu

Abstract

This paper attempts to examine the causality relationship between foreign direct investment (FDI) and economic growth (GDPGR) in Turkey using the time-series techniques. All analyses are conducted with the annual data of foreign direct investment and real gross domestic product of Turkey over the period of 1979-2011. The results of the ADF unit root test show that the time-series variable are non-stationary at levels, but become stationary in the first differences. Besides, the results of the Johansen co-integration test indicate that both series are co-integrated and a positive long-run relationship exists between FDI and GDPGR. Findings of the Granger-causality method suggest that there is a bi-directional causality between them.

Keywords: Economic Growth, Foreign Direct Investment, the Johansen Co-integration test, the Granger Causality test

JEL Classification Codes: F21, F43

Doğrudan Yabancı Yatırımlar ve Ekonomik Büyüme: Türkiye Üzerine Zaman Serisi Analizi, 1979-2011

Özet

Bu çalışmada Türkiye için doğrudan yabancı yatırımlarla (DYY) ekonomik büyüme arasındaki ilişki zaman serisi analizi kullanılarak incelenmektedir. Bu çalışmadaki tüm analizlerde, Türkiye için 1979-2011 dönemini kapsayan doğrudan yabancı yatırımlar ve gayri safi yurtiçi hasılaya ait yıllık veriler kullanılmıştır. Zaman serisi verileri kullanılarak uygulanan ADF birim kök testi sonucuna göre değişkenlerin durağan olmadıkları fakat birinci fark değerlerinde durağan oldukları gözlenmiştir. Bununla birlikte, Johansen eşbütünleşme test sonucu iki serinin eşbütünleşik olduğunu ve DYY ile ekonomik büyüme arasında uzun dönemli pozitif bir ilişkinin devam ettiğini belirtmiştir. Granger nedensellik testi doğrudan yabancı yatırımlar ve ekonomik büyüme arasında iki yönlü nedensellik ilişkisinin olduğunu ortaya koymuştur.

Anahtar Kelimeler: Ekonomik Büyüme, Doğrudan Yabancı Yatırımlar, Johansen Eşbütünleşme testi, Granger Nedensellik testi

JEL Sınıflandırma Kodları: F21, F43

Atıfta bulunmak için... |
Cite this paper |

Dogan, E. (2013). Foreign Direct Investment and Economic Growth: A Time Series Analysis of Turkey, 1979-2011. *Çankırı Karatekin Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi*, 3(2), 239-252.

1. Introduction

Do countries need foreign direct investment inflow (FDI) in order to obtain feasible and relatively higher level of growth rates? Most undeveloped and developing countries have experienced insufficient amount of national savings to reach desirable growth rates. *The Sunday Times* (2001) reports that FDI must meet this investment-saving gap. There are several channels how FDI promotes economies: UNCTAD (1999) reports that FDI helps economies to grow up through increases in the amount and efficiency of total investment in host countries; Wang (2009) argues that the target of FDI is stimulating the home countries' GDPGR since capital movement and technological progress are the milestone of the economies; Bhattarai & Ghatak (2010) note that imports of the advanced technology management and marketing increase the efficiency in the levels of productions and distributions, the value of capital stock in the home countries, and the level of living standards and welfares in both host and foreign countries; Yılmaz (2010) indicates that FDI stimulates the GDPGR through increases in the usage of resources, the infrastructure investment, and the technological improvement.

The undeveloped and developing countries including Turkey should thus take the advantage of FDI, while it intuitively looks for a country to go with respect to the potential profits and opportunities. Aitken & Harrison (1999) state that many countries simplify their regulations on FDI, and aggressively propose tax reductions and subsidies to get more of available FDI into their own lands. Ford et al. (2008) indicate that several governments assign their public departments to pull more FDI towards their own homelands using the reserved amount of public funds. This implies that the countries are willing to bear some costs to do so.

In conjunction with the theoretical arguments from the existing literature, statistics about Turkey show that the amount of FDI increased from \$0.075 billion in 1979 to \$16 billion in 2011 and the value of GDP increased from \$69 billion in 1979 to \$775 billion in 2011. This remarkable and simultaneous increase in both variables takes my attention. The purpose of this study is investigating the relationship between foreign direct investment inflows and economic growth in Turkey in the period of 1979 and 2011 applying time-series techniques, namely the Augmented Dickey-Fuller unit root test, the Johansen co-integration test, and vector error correction model (VECM). I also test the direction of linkage between FDI and GDPGR by the Granger causality test. This study differs from the old papers as it works with the most updated data, and examines the pure connection between GDPGR and FDI in Turkey.

I organize the shape of this paper as follows: the second section brings literature review up, the third section provides further information about the data and

methodology, the forth section exhibits the estimation process and results, and the last section summarizes the paper.

2. Literature Review

A fair amount of theoretical and empirical papers find a positive relationship between foreign direct investment and economic growth, while a few support the opposite side. For example of opposite views, Blomstrom et al. (1992) divide 78 developing countries into two groups as low-income and high-income countries, and exert that there is no tie between FDI and GDPGR in the low-income countries although there is a positive effect of FDI on GDPGR in the high-income countries. Carkovic & Levine (2002) do not find a significant effect of FDI on economic growth if the host and foreign countries are at different levels of trade-openness. Umeora (2013) does not find FDI to have any effect on GDPGR in a case study of Nigeria over the period 1986-2011.

One of the earlier works by Wallis (1968), on the other hand, reports that an increase in FDI from the U.S.A. to the European Union promotes the economic growth in the receiving region. Mello (1999) uses the panel data model, and finds a positive relationship between the variables in the long run. Bosworth & Collins (1999) examine 85 countries (62 developing and 23 developed countries) for the years of 1978-1995, and expose a positive relationship between FDI and GDPGR. Xu (2000) studies the effect of FDI on GDPGR for 40 undeveloped and developing countries to where FDI flows from United States, and concludes that FDI positively impact the growth if the minimum amount of human capital exists. Ericson & Irandoust (2001) apply the Granger causality test on several countries over the period 1970 through 1997, state a unidirectional causality from FDI to growth in most countries. Basu et al. (2003) use a co-integration test on 23 developing countries between 1978 and 1996, and expose a long-run linkage between them. Bhattarai & Ghatak (2010) estimate a model using the panel data for 30 OECD countries for the years 1990-2004, and argue that FDI inflow positively affects GDPGR. Antwi et al. (2013) find that FDI contributed to economic growth in Ghana over the period 1980 through 2010.

The studies that work on a case study of Turkey show various results. Such as Aslanoglu (2002) finds there is no straightforward causality relationship between FDI and GDPGR applying the Granger causality test in the period of 1975 and 1995. Alici & Ucal (2003) perform vector autoregression (VAR) model and the Toda-Yamamoto causality test and reveal that no significant connection between FDI and GDPGR exists. Alagoz et al. (2008) do not find a linkage between the variables employing the Granger causality test over the period 1992 through 2007. Kahramanoglu (2009)

investigates the relationship of FDI and GDPGR in two separated periods of 1970-2002 and 2002-2008, and concludes that a bi-directional causality occurs between FDI and GDPGR along the second period, whereas there is a one-way causality running from GDPGR to FDI in the first period. Yılmaz et al. (2011) apply a time-series methods on the presence of linkage between FDI and GDPGR for Turkey in the period of 1980-2008, and find that both series are co-integrated and have a long-run relationship. Ekinci (2011) reveals that there is a two-way causality between GDPGR and FDI applying time-series techniques over the period 1980 through 2010.

3. Data and Methodology

The data used in this study are the aggregate annual time series at constant prices for real gross domestic product (GDP) and total net inflows of foreign direct investment (FDI) covering the period of 1979-2011 in 33 pairs of observations. GDP is commonly used to represent economic growth. The data are drawn from the World Bank's "World Development Indicators" and in U.S. billion-dollars. Aggregates are based on 2000 U.S. dollars, and converted from domestic currencies using single year official exchange rates by the World Bank. The data are available in Appendix A.

The relationship between foreign direct investment inflow and economic growth in Turkey is stated as:

$$FDI_t = \pi_0 + \pi_1 GDPGR_t + \zeta_t$$

and,

$$GDPGR_t = \pi_0 + \pi_1 FDI_t + \eta_t$$

where the parameters ζ and η are normally distributed error terms.

4. Estimations and Results

4.1. Unit Root Test

The purpose of applying the unit root test is empirically examining whether a time-series contains a unit root. If the series has a unit root, it is said to be non-stationary; otherwise, the series is considered as stationary. A stationary variable is observed when the mean, variance, and auto-covariance of the time-series are constant along time according to Enders (2004). When the variables are non-stationary, Granger & Newbold (1974) state that one is likely to get a spurious regression which has a high R^2 (goodness of fit) and statistically significant coefficients although these series are actually unrelated, and implies that the results are without any economic meaning.

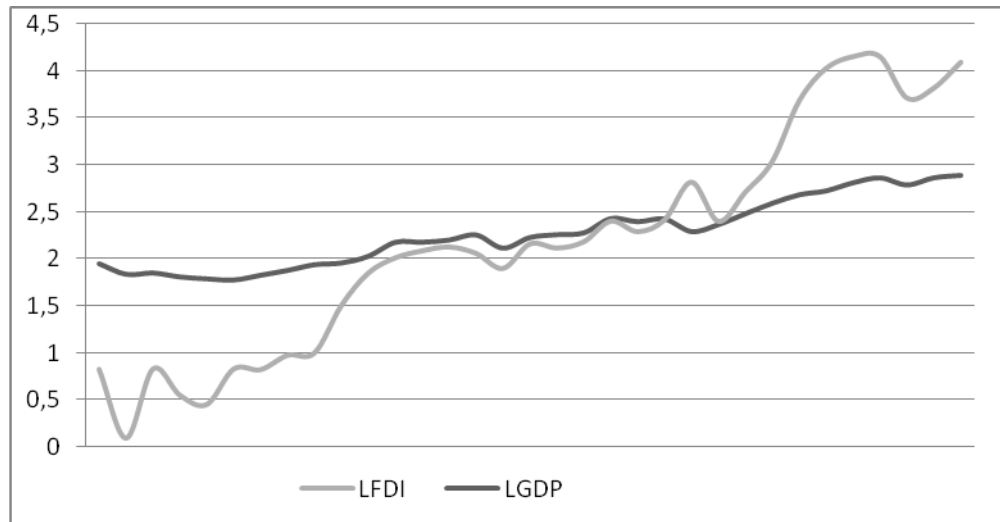


Figure 1: Trends of LFDI and LGDP of Turkey (1979-2011)

After a brief look at the figure 1, one can notice non-zero mean and trend over time. This signs that both variables contain a unit root; however, I must apply a statistical test to prove it is the actual case. One of the most popular methods is the Augmented Dickey-Fuller (ADF) unit root test (Dickey & Fuller, 1979) to finalize whether the series are stationary or not. The ADF unit root test takes the following form (1):

$$\Delta X_t = \alpha + \beta X_{t-1} + \sum_{i=1}^k \lambda_i \Delta X_{t-i} + \gamma T + \varepsilon_t \quad (1)$$

The ADF test concludes whether there is a unit root in X_t , namely FDI and GDP. In the regression, ε_t is a normally distributed white noise error term, T represents for a deterministic time trend, X_{t-1} are the lagged values of the mentioned variables, $\gamma, \lambda, \beta, \alpha$ are the estimated parameters, and ΔX_{t-i} is the lagged values of the first differences. Instead of applying Autoregressive (AR) analysis, the right lag length is determined by the method of Said and Dickey (1984), $k = N^{1/3}$, where N is the number of observations and k is the optimal lag length. An important step is selecting the right lag length (k) for the test process because of two reasons: (1) if ‘ k ’ is too small some serial correlation can be left in the errors and the test can be biased, (2) if ‘ k ’ is too large the power of the test will be lower. This method suggests that the appropriate lag length is 3 in the ADF process as the data have 33 pairs of observations.

Logarithmic values of the observations in the time-series data are first used in order to assess a stationary series, where LFDI and LGDP represent for log of FDI and log of GDP, respectively. The null hypotheses in table 1 are that LFDI has a unit root in the

first case and LGDP has a unit root in the second case, and the alternative hypotheses are that neither of them has a unit root. The result of ADF process in the table 1 includes an option of trend and constant because the Figure 1 suggests that the variables have them. Both the z-scores and p-values yield that LFDI and LGDP have a unit root, because I fail to reject the null hypothesis at 5% level of significance as it falls within the acceptance interval. Hence, both variables are said to be non-stationary.

Table 1: The Result of ADF Unit Root Test at Levels

Variable	z(t) Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	p-value for z(t)	Decision
LFDI	-2.677	-4.343	-3.584	-3.23	0.2456	Fail to Reject
LGDP	-2.501	-4.352	-3.588	-3.233	0.3276	Fail to Reject

One of the best ways is taking the first differences of the time-series to attain a stationary series if the time-series are concluded to be non-stationary. Thus, I take the first differences of LFDI and LGDP.

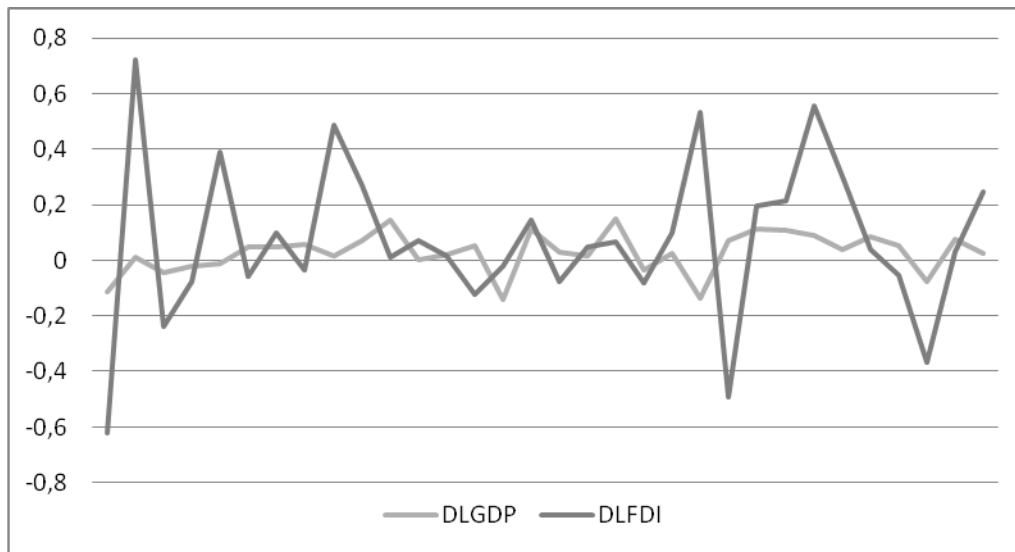


Figure 2: First Differences of LFDI and LGDP of Turkey (1979-2011)

After a quick glance at the figure 2, the pairs of observations seem to exhibit mean-reverting behavior, and have constant variances over time. This implies that the

variables are likely to have no unit root; however, I must again follow ADF unit root test to make it statistically meaningful.

The null hypotheses and the alternative hypotheses in the table 2 are set in the same way just as in the previous process, but ADF process is run without an option of constant and trend in this step. Because the test statistic is smaller than the critical value, and does not fall within the acceptance interval at 5% level of significance, the null hypotheses of having a unit root are rejected for both series. Therefore, the variables now become stationary and are integrated in order one, I (1).

Table 2: The result of the ADF Unit Root Test on the First-Differences

Variable	z(t) Test Statistic	1% Critical Value	5% Critical Value	10% Critical Value	p-value for z(t)	Decision
DLFDI	-3.625	-4.343	-3.584	-3.23	0.0278	Reject
DLGDP	-3.902	-4.343	-3.584	-3.23	0.0121	Reject

Tari (2005) explains that two or more time-series data could be co-integrated if they are integrated in the same order, and these variables at levels do not cause a spurious regression. Thus, co-integration techniques are applied onto LFDI and LGDP as both of the time-series are I(1).

4.2. Co-integration Test

Co-integration explains that one or more linear combinations of time-series variables are stationary even though they are individually non-stationary according to Dickey et al. (1991). In other words, if two or more series are individually integrated in the same order but some linear combination of them have lower order of integration, then the series are said to be co-integrated. Granger & Newbold (1974) report that a possible presence of co-integration has to be taken into account when one select a method to make a hypothesis on the relationship between two non-stationary variables.

Before moving to co-integration test, I firstly need to determine the optimal lag-length using the criteria such as AIC, BIC, and SIC. I then employ the following output in the table 3 to pin down the optimal lag-length. Indeed, the stars show that the lag-length is one. Please note that information criteria have to be minimized, and that's the reason why the stars are shown at certain values.

Table 3: Lag Length Selection Criteria

Lag	LL	LR	df	p	FPE	AIC	HQC	SBIC
0	-55.287	-	-	-	0.178191	3.9508	3.98033	4.0451
1	-3.5992	103.37*	4	0.000	0.006656*	0.662017*	0.750614*	0.944905*
2	-1.2339	4.7307	4	0.316	0.007475	0.774751	0.922413	1.24623
3	-1.0746	0.31867	4	0.989	0.009885	1.03962	1.24635	1.6997
4	3.00617	8.1614	4	0.086	0.010058	1.03406	1.29985	1.88272

After selecting the right length, the Johansen ML co-integration test by Johansen (1988, 1991) is used to determine whether LFDI and LGDP are co-integrated. The Johansen multivariate co-integration test involves the proof of relationship between the time-series, takes the following vector auto-regression (VAR) model equation (2):

$$\Delta \ln Y_t = \sum_{i=1}^k \Gamma_i \Delta \ln Y_{t-i} + \Pi \ln Y_{t-i} + \varepsilon_t \quad (2)$$

where Y_t represents $n \times 1$ vector of $I(1)$ variables, namely foreign direct investment (FDI) and gross domestic product (GDP). Parameter Γ and Π represent for $n \times n$ matrix of coefficients to be tested. All I need to know is that if the rank is zero, there will be no co-integrating relationship. If the rank (r) is one there will be one co-integrating relation, if it is two there will be two co-integrating relations and so on. When there is a co-integration between two time-series, these series have a long-run relation and cannot move too far away from each other.

This test is based on maximum likelihood estimation and two statistics: maximum eigenvalue (K_{\max}) and a trace-statistics (λ_{trace}), where the λ_{trace} statistic tests the null hypothesis that r is equal to zero (no co-integration) against a general alternative hypothesis of $r > 0$ (co-integration). The K_{\max} statistic tests the null hypothesis that the number of co-integrating vectors is r co-integrating vectors versus the alternative of $r+1$ co-integrating vectors. The result in the table 4 indicates that the null hypothesis of no co-integration is rejected for rank of zero at 5% level of significance since trace statistic is bigger than 5% critical value. In the next step, the null hypothesis of “1 co-integrating equation” versus “2 co-integrating equations” cannot be rejected at 5% level of significance as trace statistic is smaller than 5% critical value. I finally conclude that there is one co-integrating equation that allows us to identify vector error correction mechanism, is covered in the next part.

Table 4: The result of the Johansen ML Co-integration test

Maximum Rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	2	-19.2055	-	16.7899	15.41
1	5	-10.8426	0.40707	0.0642*	3.76
2	6	-10.8105	0.00201	-	-

4.3. Vector Error Correction Mechanism

If two time series are co-integrated by a common factor (co-integrating vector) it is not possible to use a standard Vector Autoregression (VAR) Model. I have to account for this relationship and use a Vector Error Correction Mechanism (VECM) which adjusts both short run changes in variables and deviations from equilibrium. I also have to make sure that the estimated parameter of ‘equation one’ in VECM will be negative and statistically significant if VECM is a correct technique to go with. The negative sign guarantees that deviations in the short-run make the long-run equilibrium exist over time.

The table 5 shows that the coefficient of ‘equation one’ is -0.46 and statistically significant at 5% level. Besides, error correction mechanism works and any short-term fluctuations between the time series of GDPGR and FDI lead to a stable positive long run relationship since the value of coefficient lies down between zero and minus one. Referring to the definition by Ghatak (1998), nearly 46% of disequilibrium is “corrected” each year.

Table 5: The Result of Vector Error Correction Model

Co-integrating equations							
Equation		Parms	chi2	P>chi2			
_ce1		1	197.661	0			
Identification : beta is exactly identified							
Johansen normalization restriction imposed							
_ce1	beta	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
	lgdp	1	.	.	.	.	.
	lfdi	-0.4607	0.03277	-14.06	0	-0.5249	-0.3965
	_cons	-5.1721	.	.	.	.	.

Granger (1988) argues that if two series are co-integrated, there must be a Granger-causality in at least one direction. I accordingly examine the Granger causality test in the next section to investigate the direction of linkage between LFDI and LGDP.

4.4. Granger Causality

Granger (1988) reports that the Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. It can be relevant only when the variables are either stationary or non-stationary but co-integrated, can be written as:

$$\ln \text{GDP}_t = \alpha_1 + \beta_1 \ln \text{GDP}_{t-1} + \beta_2 \ln \text{GDP}_{t-2} + \dots + \delta_1 \ln \text{FDI}_{t-1} + \delta_2 \ln \text{FDI}_{t-2} + \dots + \varepsilon_{1t} \quad (3)$$

$$\ln \text{FDI}_t = \alpha_2 + \gamma_1 \ln \text{FDI}_{t-1} + \gamma_2 \ln \text{FDI}_{t-2} + \dots + \lambda_1 \ln \text{GDP}_{t-1} + \lambda_2 \ln \text{GDP}_{t-2} + \dots + \varepsilon_{2t} \quad (4)$$

where ε_{1t} and ε_{2t} are white noise error terms, and β , δ , γ , λ are the parameters which tell how much the past values of the variables can explain the current value of either series. The null hypothesis in general is variable X does not Granger cause variable Y. In our example there are two null hypotheses: Foreign direct investment does not Granger cause economic growth (GDPGR), and economic growth does not Granger cause FDI. The null hypothesis of no Granger causality cannot be rejected if and only if no lagged value of an explanatory variable is retained in the regression (3) and or in the regression (4).

Table 6: The Result of the Granger Causality Test

Equation	Excluded	chi2	df	Prob>chi2
LGDP	LFDI	6.7041	1	0.01
LGDP	ALL	6.7041	1	0.01
LFDI	LGDP	5.3985	1	0.02
LFDI	ALL	5.3985	1	0.02

The result in the table 6 indicates that I reject the null hypotheses. Hence, GDPGR Granger Causes FDI just as FDI Granger Causes GDPGR at 5% significance level, meaning that there is a two-way (mutual) causality effect between foreign direct investment and economic growth.

5. Summary and Conclusions

This study attempts to investigate the relationship between foreign direct investment (FDI) and economic growth (GDPGR) using the annual data over the period of 1979-

2011. The processes of this paper show that a positive long-run relationship exists between the variables. The ADF unit root test suggests that the variables are non-stationary at levels, but become stationary in the first differences. The Johansen co-integration test indicates that there is long-run relationship between FDI and GDPGR, and the effect is significant. Also, finding of Granger causality states that there is a bi-directional causality between FDI and GDPGR. As Kahramanoglu (2009) suggests, the results of this study imply that a positive change in the level of production of goods and services is likely to increase the FDI in Turkey. Besides, politics and economists in Turkey should give more attention on attracting higher levels of foreign direct investment into Turkey in order to promote economic growth.

Appendix A:

Year	GDP	FDI	Year	GDP	FDI	Year	GDP	FDI
1979	89.3	0.075	1990	150.6	0.684	2001	196.1	3.352
1980	68.8	0.018	1991	151.04	0.81	2002	232.53	1.082
1981	71.05	0.095	1992	159.09	0.844	2003	303	1.702
1982	64.6	0.055	1993	180.42	0.636	2004	392.18	2.785
1983	61.6	0.046	1994	130.69	0.608	2005	482.23	10.03
1984	59.9	0.113	1995	169.48	0.855	2006	530.9	20.18
1985	67.2	0.099	1996	181.47	0.722	2007	647.15	22.04
1986	75.7	0.125	1997	189.83	0.805	2008	730.33	19.50
1987	87.1	0.115	1998	269.28	0.94	2009	614.55	8.411
1988	90.8	0.354	1999	249.75	0.783	2010	731.14	9.038
1989	107.1	0.663	2000	266.56	0.982	2011	774.98	16.03

Source: World Bank (<http://data.worldbank.org>)

References

- Alagoz, M., Erdogan, S., & Topalli, N. (2008). Doğrudan Yabancı Sermaye Yatırımları ve Ekonomik Büyüme: Türkiye Deneyimi 1992-2007. *Journal of Social Science at Gaziantep University*, 7(1), 79-89.
- Aitken, B., & Harrison, A. (1999). Do Domestic Firms Benefit from Foreign Direct Investment? Evidence from Venezuela. *American Economic Review*, 3, 605-18.
- Alici, A.A., & Ucal, M.Ş. (2003). Foreign Direct Investment, Export and Output Growth of Turkey: Causality Analysis. *Paperto be presented at the European Trade Study Group (ETSG) Fifth Annual Conference*, Universidad Carlos III de Madrid, 11-13.

- Antwi, S., Mills, E., Mills, G., & Zhao X. (2013). Impact of Foreign Direct Investment on Economic Growth: Empirical Evidence from Ghana. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 3(1), 18–25.
- Aslanoglu, E. (2002). The Structure and the Impact of Foreign Direct Investment in Turkey. *Journal of Faculty of Economics at Marmara University*, 17(1), 31-50.
- Basu, P., Chakraborty, C., & Reagle, D. (2003). Liberalization, FDI and Growth in Developing Countries: A Panel Co-integration Approach, *Economic Inquiry*, 41(3), 510-516.
- Bhattarai K., & Ghatak, S. (2010). *FDI, Investment and Growth in OECD Countries*. Economics Discussion Paper, 2010/5, Kingston.
- Blomstrom, M., Robert, E.L., & Mario, Z. (1992). *What Explains Developing Country Growth*. NBER Working Paper 4132.
- Bosworth, B., & Collins, S.M. (1999). *Capital Inflows, Investment and Growth*. Tokyo Club Papers, 12, 35-74.
- Carkovic, M., & Ross, L. (2002). *Does Foreign Direct Investment Accelerate Growth*. Mimeo, University of Minnesota.
- Dickey, D.A., & Fuller, W.A. (1979). Distributions of the Estimators for Autoregressive Time Series with a Unit Root. *Journal of the American Statistical Association*, 74, 427-431.
- Dickey, D.A., Jansen, D.W., & Thornton, D.L. (1991). A Primer on Co-integration with an Application to Money and Income. *Journal of Federal Reserve Bank of St. Louis*, 58-78.
- Ekinci, A. (2011). The Effect of Foreign Direct Investment on the Employment and Economic Growth: the Case of Turkey (1980-2010). *Journal of Economics and Administrative Sciences, Eskişehir Osmangazi University*, 6(2), 71-96.
- Enders W. (2004). *Applied Econometric Time Series*. Second Edition, New Jersey: John Wiley & Sons, Inc.
- Ericsson, J., & Irandoust, M. (2001). On the Causality between Foreign Direct Investment and Output: A Comparative Study. *The International Trade Journal*, 15(1), 1-26.

- Feldstein M., & Horioka, C. (1980). Domestic Saving and International Capital Flows. *Economic Journal*, 90(358), 314-329.
- Feldstein M. (1995). *The Effects of Outbound Foreign Direct Investment on the Domestic Capital Stock*. NBER Working Paper No. 4668
- Ford, T., Rork, J., & Elmslie, B. (2008). Foreign Direct Investment, Economic Growth, and the Human Capital Threshold: Evidence from US States. *Review of International Economics*, 16(1), 96-113.
- Ghatak, A. (1998). Aggregate Consumption Function for India: A Co-integration Analysis under Structural Changes 1919-1986. *Journal of Applied Statistics*, 25(4), 475-488.
- Granger, C.W.J. (1988). Some Recent developments in a Concepts of Causality. *Journal of Econometrics*, 39(1-2), 199-211.
- Granger, C.W.J., & Newbold, P. (1974). Spurious Regressions in Econometrics. *Journal of Econometrics*, 2, 111-120.
- Guidotti, P.E., & De Gregorio, J. (1992). *Financial Development and Economic Growth*. IMF Working Papers 92/101, International Monetary Fund.
- Johansen, S. (1988). Statistical Analysis of Co-integration Vectors. *Journal of Economic Dynamics and Control*, 12(2-3), 231-254.
- Johansen, S. (1991). Estimation and Hypothesis testing of Co-integration Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, 59(6), 1551-1580.
- Kahramanoglu, İ.E. (2009). *Uluslararası Doğrudan Yatırımların Ekonomik Büyümeye Etkisi ve Ülkelerin Hazmetme Kapasitesi-Türkiye Örneği*. Expert Thesis of Undersecretaries of Treasury, 6800.
- Mello, L.R. (1999). *Foreign Direct Investment-Led Growth: Evidence from Time Series and Panel Data*. Oxford Economic Papers, New Series, 51(1),133-151
- Said, E., & Dickey, D.A. (1984). Testing for Unit Roots in Autoregressive Moving Average Models of Unknown Order. *Biometrika*, 71, 599-607.
- Sen, A., & Saray, M.O. (2010). Türkiye’de Doğrudan Yabancı Sermaye Yatırımlarının Ekonomik Büyümeye Etkisi: Panel Veri Analizi. *Journal of Academic Resources and Studies*, 22-30.

Tarı, R. (2005). *Ekonometri*. 3th Edition, Istanbul: Publications of Kocaeli University, No: 172.

Umeora, C.E. (2013). *Effects of Foreign Direct Investment (FDI) on Economic Growth in Nigeria*. SSRN Working Papers (June 26, 2013)

UNCTAD. (1999). *World Investment Report 1999*. United Nations, New York and Geneva.

Wallis, K.F. (1968). The E.E.C. and United States Foreign Investment: Some Empirical Evidence Re-Examined. *The Economic Journal*, 78(311), 717-719.

Wang, M. (2009). Manufacturing FDI and Economic Growth: Evidence from Asian Economies. *Applied Economics*, 41, 991-1002.

Xu, B. (2000). Multinational Enterprises, Technology Diffusion and Host Country Productivity Growth. *Journal of Development Economics*, 62, 477-493.

Yılmaz, O., Kaya, V., & Akinci, M., (2011). The Effect of Foreign Direct Investment on Economic Growth in Turkey (1980-2008). *Journal of Faculty of Economics*, Atatürk University, 25(3-4), 13-30.

Yılmazer, M. (2010). Doğrudan Yabancı Yatırımlar, Dış Ticaret ve Ekonomik Büyüme İlişkisi: Türkiye Üzerine Bir Deneme. *Journal of Social Science*, Celal Bayar University, 8(1), 241-260.

<http://www.sundaytimes.lk/110529/Columns/eco.html>

<http://www.data.worldbank.com>