Theoretical and Applied Economics
Volume XIX (2012), No. 10(575), pp. 71-82

The Long Run Relationship Between Foreign Direct Investments, Exports, And Gross Domestic Product: Panel Data Implications

Mehmet ERYİĞİT
Abant Izzet Baysal University
Department of Business Administration,
Golkoy Campus, Bolu, Turkey
e-mail: eryigit_m@ibu.edu.tr

Abstract. *Foreign direct investment (FDI) is defined as establishing a new company or branch of a foreign company by foreign investor or share acquisitions of a company established in host country (any percentage of shares acquired outside the stock exchange or 10 percent or more of the shares or voting power of a company acquired through the stock exchange (UNCTAD, 2012))1. This study investigated the long-term relationship between FDI and export volume, FDI and Gross Domestic Products (GDP), and export volume and GDP through cointegration tests. It is conducted the panel data analysis using data for the period of 2000-2010 from 15 countries making direct investment in Turkey regularly since year 2000. Panel unit-root tests showed that variables are stationary for the first difference level. Residual based and error correction based cointegration tests revealed that there is long-term relationship between FDI and export volume, FDI and GDP, and export volume and GDP.*

Keywords: FDI, GDP, export volume, unit root, cointegration

[1] http://www.economy.gov.tr/upload/380BE181-C6CE-B8EF-37B940FAAD239BA2/FDI_Law.pdf;

1. Introduction

Economic and social benefits of FDI to host countries may be increased employment, improved performance, higher productivity, transfer of capital and technology, improved managerial skills (Daniels, Radebough, & Sullivan, 2009; Karagöz, 2007; Gür & Akbay, 2007; Harrison, 1994; Zhang, 2001). Therefore, FDI may be regarded as having positive effect on growth and exports. As proposed and supported by Hsiao and Hsiao (2006) there exists triangle relationship between FDI, export and growth. This means that FDI has both direct and indirect effects on growth though exports. Besides that, FDI inflows and growth may be interrelated since FDI could be attracted to the growing economies (Hsiao & Hsiao, 2006).

FDI and export are also related with each other however, the relationship may be positive or negative depending on whether FDI is market seeking or efficiency seeking (Hsiao and Hsiao, 2006). Some studies (e.g. Lipsey & Weis, 1981, 1984; Anwar & Nguyen, 2011) indicated that FDI and export volume are complementary. Thus, FDI and export volume also may be regarded as interrelated.

Moreover, there exists a relationship between export volume and growth. Export-led growth model proposed that exports could affect the output level and the rate of economic growth (Dritsaki, Dritsaki, & Adamopoulos, 2004). On the other hand, economic growth could lead to improved skills and technology, which in turn creates comparative advantage for the country that, facilitates exports. Hence, a growth-led export is also possible (Giles & Williams, 2001). There is no consensus in the literature on whether export leads to growth or growth influences export. Besides that, bidirectional relationship or no causal relationship between exports and FDI is also possible (Giles & Williams, 2001).

Therefore, the relationship between FDI, GDP and export is unclear. Studies focusing on the long-term relationship between FDI, export volume and gross domestic product (GDP) revealed inconsistent findings. Besides that, most of the studies have conducted on FDI for developed countries. Thus, there is a lack of research on developing countries. In addition, more research focusing on home country based analysis rather than aggregate FDI may be beneficial.

From these points, the purpose of this study is to examine the long-term relationship between FDI and export volume, FDI and GDP, and export volume and GDP through cointegration tests. The study is conducting on FDI inflows to Turkey from 15 countries* that made direct investments in Turkey for the period of year 2000-2010.

2. Relationship between FDI, GDP and Exports

Many studies (Alfaro, 2003; Borensztein, Gregorio, & Lee, 1998; Johnson, 2006; Vu & Gangnes, 2007; Mottaleb, 2007; Hsiao & Hsiao, 2006) have provided empirical support for the direct effect of FDI on growth whereas some other studies (Vuksic, 2005; Kutan & Vuksic, 2007; Lipsey & Weis, 1981, 1984; Anwar & Nguyen, 2011) found indirect effect of FDI through exports. Moreover, the relationship between FDI and growth varies from country to country. For instance, Zhang (2001) investigated the long run relationship between

* Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Netherlands, Spain, Sweden, Switzerland, United Kingdom, United States.

FDI and growth for 11 developing countries in East Asia and Latin America. The results of cointegration tests indicated that there is bidirectional causality between FDI and growth for two countries and unidirectional causality for three countries.

Liu, Wang, and Wei (2001) examined the causal relationship between foreign trade and FDI inflows to China from 19 countries / regions during 1984 – 1998 through panel data analysis. The results of the study showed that growth in China's export volume affected by FDI inflows to China.

Dritsaki, et. al., (2004) examined the long run relationship between FDI, growth, and exports through cointegration tests. They investigated FDI inflows to Greece for the period of 1960-2002. Their study revealed that there is a long run equilibrium and causal relationship between those variables.

A similar study (Hsiao & Hsiao, 2006) investigated the relationship between FDI, export, and GDP for eight East and Southeast Asian economies through Granger causality test and panel data analysis for the period of 1986 – 2004. The results of the study showed that FDI influence GDP both directly and indirectly through exports. In addition, there is bidirectional causality between exports and GDP for the group.

Kutan and Vuksic (2007) investigated the effects of FDI on export potential on 12 Central and Eastern European countries for 1996- 2004 period. The study showed that FDI increases local supply, which in turn causes an increase in export volume.

Another study (Miankhel, Thangavelu & Kalirajan, 2009) examined dynamic relationship between exports, FDI and GDP for six emerging countries through vector error corrected model. According to the results of the study, the main factor affecting GDP growth is FDI in India whereas it is exports in Pakistan. The study showed that exports affect GDP growth and output in long run in Mexico and Chile. However, the relationship between those variables differs for the two countries in the short run. The results of the study also revealed that there exists bidirectional causality between FDI and GDP in Malaysia. On the contrary, the study did not find any relationship between these variables in Thailand.

Nishiyama and Yamaguchi (2010) investigated FDI inflows from developed countries to developing countries and indicated that FDI leads to an increase in GDP of developing countries. Another study by Ekinci (2010) examined the long run relationship between economic growth, employment and FDI for 1980-2010 periods for Turkey. Results of granger causality test showed that there is a long run relationship between FDI and economic growth. A similar study (Erdal & Tatoglu, 2002) which investigated FDI inflows to Turkey for the period of 1980 – 1998 revealed that market size, market growth rate, and openness to abroad have significant positive effects on FDI.

Another study (Vergil & Çeştepe 2006) investigated the affects of exchange rate, economic instability, the openness on FDI inflows to Turkey for 1992 – 2000 period through gravity model and for 1998-2001 period through time series analysis. The study showed that exchange rate and the openness have significant positive effects on FDI inflows. Results also showed that economic instability, which measured by GDP, has significant negative effect on FDI.

3. Turkey's share in world FDI inflows

When FDI inflows to developing countries are examined, Turkey seems to be an attractive destination among others between years 2002 - 2007. Table 1 presents Turkey's share of FDI inflows to developing countries. For the last decade, Turkey had the highest share of FDI inflows (4.1 %) in 2006 among other developing countries. Then, Turkey's share started to decrease as it was 3.4 % in 2007, 2.4 % in 2008, and 1.4 % in 2009.

Table 1 FDI inflows to Turkey

Year	FDI inflows to Turkey (Billion $)	Change in FDI inflows to Turkey (%)	World FDI inflows (Billion $)	Turkey's share of world FDI inflows (%)	Turkey's share of FDI inflows to developing countries (%)
2000	1.0		1401	0.07	0.4
2001	3.4	240	825	0.41	1.5
2002	1.1	-68	628	0.18	0.6
2003	1.7	55	566	0.30	0.8
2004	2.8	65	732	0.38	0.9
2005	10.,0	257	986	1.01	2.8
2006	20.2	102	1456	1.39	4.1
2007	22.0	9	2100	1.05	3.4
2008	18.2	-17	1771	1.03	2.4
2009	7.6	-58	1114	0.68	1.4

Source: International Investors Associations (YASED, http://www.yased.org.tr)

According to Table 1, Turkey's share of world FDI inflows has similar trend with its share among developing countries. Turkey's share of world FDI inflows was 1.38 %, the highest of all, in 2006 while it was 0.35 %during 1989-1994. It remains over 1 % until 2009, and then it decreased to 0.68 %.

FDI inflows to Turkey decreased as 58 % in 2009. Total world FDI inflows also decreased (37%) in 2009. The reason for this was mainly the uncertainty in world markets because of the financial crisis that has occurred in 2008 in USA and has spread into other developed and developing countries. Since one of the most important factors that discourage FDI is economical and financial instability and uncertainty. FDI inflows to Turkey are mostly from OECD countries. A recession in these countries directly affects their foreign investments, which in turn leads to a decrease in FDI inflows to Turkey.

FDI can be regarded as a bidirectional flow. Since, those countries that attract most of FDI generally are the ones that make most of FDI. For instance, in 2009, USA is the first in FDI outflows and FDI inflows in the world. Moreover, as it can be seen from Tables 2a and 2b, China, France, Hong Kong, Germany, and Russia are among the first ten countries that both make and attract FDI. Among countries attracting FDI, Turkey ranked 53 in 2002 and 2003, 22 in 2005, 20 in 2008 and 32 in 2009. According to FDI outflows, Turkey had the rank of 44 in 2008 and 45 in 2009.

Table 2a The list of first 10 Countries (Inflow FDI)

2009	2008	Country	Quantity (Billion $)
1	1	USA	129.9
2	3	China	95.0
3	7	France	59.6
4	9	Hong Kong	48.4
5	4	England	45.7
6	5	Russia	38.7
7	17	Germany	35.6
8	15	Saudi Arabia	35.5
9	14	India	34.6
10	2	Belgium	33.8
32	**20**	**Turkey**	**7.6**

Table 2b The list of first 10 countries (Outflow FDI)

2009	2008	Country	Quantity (Billion $)
1	1	USA	248.1
2	2	France	147.2
3	6	Japan	74.7
4	4	Germany	62.7
5	13	Hong Kong	52.3
6	11	China	4.
7	10	Russia	46.1
8	14	Italy	43.9
9	7	Canada	38.8
10	17	Norvey	34.2
45	**44**	**Turkey**	**1.6**

Source: World Investment Report, 20th anniversary edition, United Nations Conference on trade and development, 2010.

Hence, FDI has many benefits to host countries, it is important to achieve sustainable increase in FDI inflows to Turkey. However, FDI inflows to Turkey have been decreasing and, seem that it is not sustainable increasing for a long time.

4. Methodology

4.1 Data Sources

Various databases are used to gather the data required to measure the variables examined this study. Export volume of Turkey to 15 countries are gathered from Turkish Statistics Institute (TUIK) (www.tuik.gov.tr), GDP values of countries are gathered from United States Department of Agriculture (USDA) (http://www.ers.usda.gov/data/macroeconomics/), FDI inflows to Turkey from each country is gathered from OECD database.

4.2 The Model, Analysis, and Findings

Both time series and panel data analysis requires some steps to follow. At first, it should be tested that whether the data is stationary or not. In panel data analysis the unit root test requires the determination of dependence among cross sections. Since the method of testing

stationary of the data depends on the existence of dependence. There are different tests used for the case of in dependent cross-sectional units and for the case of dependent cross-section very. If the existence of dependence is rejected than first generation tests should be used such as Levin, Lin, and Chu (LLC, 2002); Harris and Tzavalis (H-T, 1999); Breitung (2001); Im, Pesaran, and Shin (IPS, 2003); Fisher type (Choi 2001) tests, and Hadri LM (2000) test. If cross-sectonal units are dependent, second generation tests should be used such as Bai and Ng (2004), Moon and Peron (2004), Phillips and Sul (2003), Pesaran (2003, 2008), and O'Connell (1998) tests (Hurlin & Mignon, 2006).

The time series dimension (T) and the cross section dimension (N) are important issues in the analysis of panel data. There may be four cases related with time and size as (a) N → large, T → large, (b) N → large, T → small, (c) N → small, T → large, (d) N → small, T → small. Whether the results of cross-section dependence tests, unit root tests and cointegration tests vary for the four different cases have been examined using simulation tests. There have been a relatively rare number of studies examining the fourth case which is both T and N is small. Levin, Lin, and Chu (2002) showed that when N is between 10 – 250 and T is between 5 – 250, LLC test may be more appropriate among other unit root tests. IPS test is not as strict as LLC test. Thus, for small samples IPS provides better fit. However, if T is so small, the test becomes weaker. If T is too larger then N, data will have the characteristics of time series.

In order to determine the long run relationship between FDI, GDP and export volume at first, we tested unit roots of the variables. The analysis is conducted for both cases of existence and nonexistence of trends in the equations. Unit root tests show that variables have unit root meaning that they are stationary or not. The results of the unit root tests are provided in Table 3. As it can be seen from Table 3, most of the test results showed the variables are stationary for the first difference.

Table 3: Level and first difference unit root test results

Level unit root test results – I(0)							
Variables		***LLC (t^*,p)***	***H-T (Z, p)***	***Breitung (λ, p)***	***IPS (z-t-tilde-bar, p)***	***Fisher (ADF – Mod. X^2, p)***	***Hadri LM (Z, p)***
LnExport	*With trend*	0.7066 (0.7601)	1.8828 (0.9701)	1.9586 (0.9749)	1.2984 (0.9029)	-2.7687 (0.9972)	9.6135 (0.0000*)
	Without trend	-6.9662 (0.0000*)	1.0144 (0.8448)	2.5724 (0.9950)	-0.7831 (0.2168)	-0.5380 (0.7047)	18.3819 (0.0000*)
LnFdi	*With trend*	-5.2691 (0.0000*)	-3.8236 (0.0001*)	-1.8102 (0.0351**)	-2.4133 (0.0079*)	0.9398 (0.1737)	1.9146 (0.0278)
	Without trend	-4.9979 (0.0000*)	-7.8753 (0.0000*)	-3.7551 (0.0001*)	-1.4235 (0.0773***)	1.0863 (0.1387)	2.5230 (0.005**)
LnGdp	*With trend*	-6.2684 (0.0000*)	3.3296 (0.9996)	1.6444 (0.9499)	1.1020 (0.8648	-3.2190 (0.9994)	8.7694 (0.0000*)
	Without trend	4.0102 (0.0000*)	1.0951 (0.8633)	3.0639 (0.9989)	0.3591 (0.6402)	-1.3953 (0.9185)	18.8476 (0.0000*)

First difference unit root test results – I(1)							
Variables		***LLC (t^*,p)***	***H-T (Z, p)***	***Breitung (λ, p)***	***IPS (z-t-tilde-bar, p)***	***Fisher (ADF – Mod. X^2, p)***	***Hadri LM (Z, p)***
LnExport	*With trend*	-8.1603 (0.0000*)	-3.7077 (0.0001*)	-0.9849 (0.1623)	-5.0598 (0.0000*)	11.9530 (0.0000*)	-0.0316 (0,5126)

	Without trend	-3.12374 (0.0009*)	-10.6064 (0.0000*)	-6.0950 (0.0000*)	-3.4836 (0.0002*)	8.4132 (0.0000*)	0.8113 (0.2086)
LnFdi	*With trend*	-5.2628 (0.0000*)	-7.7257 (0.0000*)	-4.6519 (0.0000*)	-4.9407 (0.0000*)	11.2035 (0.0000*)	-2.1332 (0.9835)
	Without trend	-5.4789 (0.0000*)	-15.0105 (0.0000*)	-6.7338 (0.0000*)	-4.6027 (0.0000*)	18.9599 (0.0000*)	-2.7270 (0.9968)
LnGdp	*With trend*	-3.6635 (0.0001*)	-1.3862 (0.0838***)	3.2529 (0.9994)	-3.7858 (0.0001*)	0.4816 (0.3151)	0.6951 (0.2435)
	Without trend	-5.5142 (0.0000*)	-7.2908 (0.0000*)	-6.0416 (0.0000*)	-2.9821 (0.0014**)	3.5296 (0.0002*)	2.5118 (0.006**)

*All unit root tests are implemented with constant and trend in the test regression and take a unit root as different null hypothesis and alternative hypothesis. Null hypothesis of **LLC, HT, Breitung test** is (H_0) "panels contains unit root", alternative hypothesis (H_a) is "panels are stationary". (H_0) for IPS test is "all panels contain unit roots" and alternative (H_a) is "some panels are stationary". (H_0) for **Fisher type** test is "all panels contain unit roots" and alternative (H_a) is "at least one panel is stationary". (H_0) for **LM** test is "all panels stationary" and alternative (H_a) is "some panels contain unit roots". * indicates that null hypothesis rejected at the significance level of 1%. ** indicates that the null hypothesis rejected at the significance level of 1 % (LM test) and *** indicates that null hypothesis for LM test is accepted at significance level of 1 %.*

As a second step, cointegration tests are conducted to determine the long run relationships between variables. We employed error correction-based cointegration tests for panel data suggested by Westerlund (2007) and residual based cointegration tests suggested by Pedroni (2004).

Residual based cointegration tests can be proceed under only some restrictive assumptions – such as; dynamic homogeneity or local cross section dependence as in spatial autoregressive or moving average models for the case of N →large (>100) and T →small (<10). The MonteCarlo simulations of Pesaran (2005) show that the cross sectional augmented panel unit root tests have satisfactory size and power for relatively small values of T and N. For very small sample sizes (N = T = 10), truncated version of the cross-sectional augmented IPS (CIPS) test and the cross sectional augmented version of Choi's inverse normal combination test show satisfactory size properties. The power of these tests critically depends on the sample sizes N and T, and on whether the model contains linear time trend or not. On the other hand, for the case of N →small (<10) and T →relatively large standard time series analysis such as seemingly unrelated regression analysis may be employed (Breitung & Pesaran, 2005).

Westerlund (2007) proposed four panel cointegration tests that are based on structural rather than residual dynamics. They do not impose any common restrictions. Two of them (G_t, G_α) are called as group-mean tests and the other two (P_t, P_α) are called as panel tests. These tests are based on structural base rather than residual dynamics as opposed to cointegration tests proposed by Pedroni (2004). Therefore, these tests don't impose any common factor limitation (Persyn & Westerlund, 2008). General formula of the cointegration test proposed by Westerlund (2007) is presented in equation (1)

$$\Delta y_{it} = \delta_i' d_t + \alpha_i y_{i,t-1} + \beta_i' x_{i,t-1} + \sum_{j=1}^{p_i} \alpha_{ij} \Delta y_{i,t-j} + \sum_{j=-q_j}^{p_i} \gamma_{ij} \Delta x_{i,t-j} + \varepsilon_{it} \quad (1)$$

In the equation (1) *i* represent the cross sectional data, *t* represents time, and ε_{it} is the error term. If the results of the analysis shows that α_i<0 it means that there is error correction and y_{it} and x_{it} are cointegrated. If α_i=0 there is no error correction and the variables are not cointegrated. Two test of Westerlund – called grouped-mean tests (*shown as* G_τ *and* G_α) test the null hypothesis of no cointegration for all cross-sectional units against the alternative hypothesis that there is cointegration for at least one countries (*null hypothesis* $H_0: p_i = 0$ *for all i versus* $H_1^G : p_i < 0$ *for at least one i*). Other two tests which are called panel tests

(*shown as* P_τ *and* P_α) test the null hypothesis of no cointegration for all cross-sectional units against the alternative hypothesis of cointegration for all cross-sectional units (*null hypothesis* $H_0: p_i = 0$ *for all i versus* $H_1^P : p_i < 0$ *for all i)* (Demetriades & James 2011; Persyn & Westerlund 2008).

Table 4 Results of the Cointegration Analysis for Exports and FDI

$ln(Export_{it}) = \mu_i + \beta_i ln(FDI_{it}) + \varepsilon_{it}$

Statistics	*Value*	*Z-value(significance)*
$\mathbf{G_t}$	-10.660	-38.628* (0.000)
$\mathbf{G_\alpha}$	-6.410	0.565 (0.714)
$\mathbf{P_t}$	-7.736	-1.999* (0.023)
$\mathbf{P_\alpha}$	-6.853	-2.108* (0.018)

Table 5 Results of the Cointegration Analysis for Exports and GDP

$ln(Export_{it}) = \mu_i + \beta_i ln(GDP_{it}) + \varepsilon_{it}$

Statistics	*Value*	*Z-value(significance)*
Gt	-6.037	-18.487* (0.000)
Gα	-8.601	-1.000 (0.159)
Pt	-11.469	-5.684* (0.000)
Pα	-7.124	-2.338* (0.010)

Table 6 Results of the Cointegration Analysis for FDI and GDP

$ln(FDI_{it}) = \mu_i + \beta_i ln(GDP_{it}) + \varepsilon_{it}$

Statistics	*Value*	*Z-value(significance)*
$\mathbf{G_t}$	-13.797	-52.296* (0.000)
$\mathbf{G_\alpha}$	-7.441	-0.171 (0.432)
$\mathbf{P_t}$	-27.425	-21.434* (0.000)
$\mathbf{P_\alpha}$	-6.988	-2.222* (0.013)

Null hypothesis $H_0: p_i = 0$ *for all i versus* $H_1^G : p_i < 0$ *for at least one i, and* $H_0: p_i = 0$ *for all i versus* $H_1^P : p_i < 0$ *for all i.*

Four tests statistics proposed by Westerlund (2007) test whether two variables move together in the long run or not. For small panel data sets results may be sensitive to some parameters like lag length and kernel width. When short term dynamics are restricted and short kernel windows are used, G_α statistics don't reject "there is no cointegration" hypothesis (H_0) (in *Table.4* G_α *: 0.565 (0.714); in Table 5* G_α *: -1.000 (0.159);in Table 6* G_α *: -0.171 (0.432))*. According to other test statistics, it can be concluded that related variables are cointegrated.

Pedroni (1997) proposed 7 test statistics which are different from statistics proposed by Westerlund (2007). Four of them (*Panel v, Panel rho, Panel PP, Panel ADF*) show in-group test statistics and the other three (*Group rho, Group PP, Group ADF*) show between group test statistics. Pedroni (1997) indicated that when T>100 all test have same power. However, T<20 panel-ADF and group- ADF test statistics provide more significant results.

Table 7 The Results of Pedroni Cointegration Tests

The results of cointegration test between export and FDI					
Trend assumption: No deterministic trend			***No deterministic intercept or trend***		
Statistics	***Value***	***Significance***	***Statistics***	***Value***	***Significance***
Panel v	-1.195669	0.8841	*Panel v*	-1.898237	0.9712
Panel rho	0.885012	0.8119	*Panel rho*	-3.847983	0.0001
Panel PP	-1.004984	0.1575	*Panel PP*	-4.773143	0.0000
Panel ADF	-2.189374	0.0143	*Panel ADF*	-4.949674	0.0000
Group rho	2.546558	0.9946	*Group rho*	1.026202	0.8476
Group PP	0.081351	0.5324	*Group PP*	-3.079519	0.0010
Group ADF	-0.541356	0.2941	*Group ADF*	-3.318541	0.0005
The results of cointegration test between export and GDP					
Trend assumption: No deterministic trend			***No deterministic intercept or trend***		
Statistics	***Value***	***Significance***	***Statistics***	***Value***	***Significance***
Panel v	1.522101	0.0640	*Panel v*	-1.441561	0.9253
Panel rho	0.001996	0.5008	*Panel rho*	0.018361	0.5073
Panel PP	-2.320487	0.0102	*Panel PP*	-1.472580	0.0704
Panel ADF	-5.322458	0.0000	*Panel ADF*	-1.107627	0.1340
Group rho	1.387814	0.9174	*Group rho*	2.831418	0.9977
Group PP	-2.759424	0.0029	*Group PP*	-0.876507	0.1904
Group ADF	-7.447482	0.0000	*Group ADF*	-0.777268	0.2185
The results of cointegration test between FDI and GDP					
Trend assumption: No deterministic trend			***No deterministic intercept or trend***		
Statistics	***Value***	***Significance***	***Statistics***	***Value***	***Significance***
Panel v	-1.518229	0.9355	*Panel v*	0.276096	0.3912
Panel rho	-2.218719	0.0133	*Panel rho*	-4.239070	0.0000
Panel PP	-5.088501	0.0000	*Panel PP*	-4.959232	0.0000
Panel ADF	-5.712873	0.0000	*Panel ADF*	-5.338893	0.0000
Group rho	0.630470	0.7358	*Group rho*	-0.137327	0.4454
Group PP	-7.720140	0.0000	*Group PP*	-4.379672	0.0000
Group ADF	-6.910554	0.0000	*Group ADF*	-6.084279	0.0000

The results of Pedroni cointegration test statistics are presented in Table 7. According to the results, there is a statistically significant cointegration between exports – FDI, exports – GDP, and FDI – GDP. In other words, these variables move together in the long run.

5. Conclusion

The relationship between FDI and trade volume is complex in its nature since which one affects another is not certain. It is not easy to determine whether FDI and trade are substitutes or complementary (Liu et al., 2001). Most of the industrial companies still use traditional market entry methods. They prefer trade to other entry methods since it is perceived as a less risky and easier entry method according to FDI and other entry methods. Through trade, companies gain experience and knowledge about foreign markets' economical, political, and social environment. Then, they perform FDI. The purpose of FDI is not solely meeting the demand of the host country but also exporting to other countries. Thus, FDI may be an essential factor contributing to host country's exports. From this point, while initially trade

leads to FDI afterwards FDI leads to more trade. It seems rational to expect a similar relationship between FDI and GDP. Our results showed that export – FDI, export – GDP and FDI – GDP are cointegrated in the long run. Thus, the results supported above mentioned theoretical propositions.

References

Alfaro, L. (2003). Foreign Direct Investment and Growth: Does the Sector Matter? *Harvard University, Harvard Business School*, Working Paper.

Anwar, S., & Nguyen, L. P. (2011). Foreign direct investment and export spillovers: Evidence from Vietnam. *International Business Review,* 20, 177–193.

Bai, J. & Ng, S. (2004). A PANIC Attack on Unit Roots and Cointegration. *Econometrica*, 72, 4, 1127-1178.

Breitung, J. (2001). The local power of some unit root tests for panel data, in Badi H. Baltagi, Thomas B. Fomby, R. Carter Hill (ed.) *Nonstationary Panels, Panel Cointegration, and Dynamic Panels (Advances in Econometrics, Volume 15)*, Emerald Group Publishing Limited, pp.161-177

Breitung, J. A., & Pesaran M. H. (2005) Unit Roots and Cointegration in Panels. IEPR Working Paper No. 05.32, CESifo Working Paper Series No. 1565.

Borensztein, E., De Gregorio, J., & Lee, J-W. (1998). How does foreign direct investment affect economic growth? *Journal of International Economics*, 45, 115–135.

Choi, I. (2001). Unit root tests for panel data. *Journal of International Money and Finance*, 20, 249–272.

Daniels J.D., Radebaugh, L. H. & Sullivan, D. P. (2009). International Business, Pearson Education Inc., NewJersey.

Demetriades, P. O., & James, G. A. (2011). Finance and Growth in Africa: The broken link. *University of Leicester, Department of Economics*, Working Paper no: 11/17.

Dritsaki, M., Dritsaki, C., & Adamopoulos, A. (2004). A Causal Relationship between Trade, Foreign Direct Investment and Economic Growth for Greece. *American Journal of Applied Sciences* 1, 3, 230-235.

Ekinci, A. (2010). Doğrudan Yabancı Yatırımların Ekonomik Büyüme ve İstihdama Etkisi: Türkiye Uygulaması (1980-2010). *Eskişehir Osmangazi Üniversitesi IIBF Dergisi*, 6, 2, 71-96.

Erdal, F. & Tatoğlu, E. (2002). Locational Determinants of Foreign Direct Investment in an Emerging Market Economy: Evidence from Turkey. *Multinational Business Review,*10(1), 21-27.

Giles, J., & Williams, C. (2001). Export-led growth: a survey of the empirical literature and some non-causality results. Part 1. *Journal of International Trade & Economic Development, Taylor and Francis Journals,* 9(3), 261-337.

Giles, J., & Williams, C. (2001). Export-led growth: a survey of the empirical literature and some non-causality results. Part 2. *Journal of International Trade & Economic Development, Taylor and Francis Journals*, 9(4), 445-470.

Gur T.H., & Akbay, O. S. (2007). Yabancı Sermaye Akımları ve Ekonomik Büyüme: Bir Literatür Çalışması, *Hacettepe Üniversitesi, İktisadi ve İdari Bilimler Fakültresi Dergisi*, 25(2), 37-60.

Hadri, K. (2000). Testing for stationarity in heterogeneous panel data. *Econometrics Journal*, 3, 2, 48-161.

Harris, R. D. F., & Tzavalis, E. (1999). Inference for unit roots in dynamic panels where the time dimension is fixed. *Journal of Econometrics*, 91(2) 201-226.

Harrison, A. (1994). The Role of Multinationals in Economic Development The Benefits of FDI. *Colombia Journal of World Business*, 29(4), 6-11.

Hsiao, F. S. T., & Hsiao, M. W. (2006). FDI, Exports, and Growth in East and Southeast Asia: Evidence from Time-Series and Panel Data Causality Analyses. *Paper presented at 2006 International Conference on Korea and the World Economy V*, Seoul, Korea.

Hurlin, C. & Mignon,V. (2006). "Second Generation Panel Unit Root Tests", http://halshs.archives-ouvertes.fr/docs/00/15/98/42/PDF/UnitRoot_Ev5.pdf

Im, K.S., Pesaran, M. H., & Shin, Y. (2003). Testing for unit roots in heterogeneous panels. *Journal of Econometrics*, 115, 53-74.

Johnson, A. (2006). The Effects of FDI Inflows on Host Country Economic Growth. *CESIS Electronic Working Paper Series, Electronic Working Paper Series, Paper No. 58.*

Karagöz, K. (2007). Türkiye'de Doğrudan Yabancı Yatırım Girişlerini Belirleyen Faktörler: 1970 –2005. *Journal of Yasar University*, 8(2). URL:http://joy.yasar.edu.tr/makale/8.sayi/mak-yasar.pdf

Kutan, A. M., & Vukšić, G. (2007). Foreign Direct Investment and Export Performance: Empirical Evidence. *Comparative Economic Studies, Palgrave Macmillan, 49(3)*, 430-445.

Levin, A., Lin, C. F., & Chu, C. S. (2002). Unit root test in panel data: asymptotic and finite–sample properties. *Journal of Econometrics*, 108, 1-24.

Lipsey, R. E., & Weiss, M. Y. (1981). Foreign Production and Exports in Manufacturing Industries. *The Review of Economics and Statistics*, 63(4), 488 – 494.

Lipsey, R. E., & Weiss, M. Y. (1984). Foreign Production and Exports of Individual Firms. *The Review of Economics and Statistics*, 66(2), *304 – 308.*

Liu, X., Wang, C., & Wei, Y. (2001). Causal links between foreign direct investment and trade in China, *China Economic Review*, 12, 190–202.

Miankhel, A. K., Thangavelu, S. M., & Kalirajan, K. (2009). Foreign Direct Investment, Exports, and Economic Growth in Selected Emerging Countries: Multivariate VAR Analysis. *Electronic copy available at:* http://ssrn.com/abstract=1526387

Nishiyama, H., & Yamaguchi, M. (2010). Foreign direct investment, international trade, and firm heterogeneity. *Economic Modelling, 27, 1*, 184-195.

Mottaleb, K. A. (2007). Determinants of Foreign Direct Investment and Its Impact on Economic Growth in Developing Countries. *Munich Personal RePEc Archive (MPEA) Paper No. 9457,* http://mpra.ub.uni-muenchen.de/9457/

Pedroni, P. (2004). Panel Cointegration: Asymptotic And Finite Sample Properties Of Pooled Time Series Tests with an Application to the Ppp Hypothesis. *Econometric Theory,* 20, 597-625 Doi:10.1017/S0266466604203073

Persyn, D., & Westerlund, J. (2008). Error –Correction-based co-integration tests for panel data. *The Stata Journal*, 8(2), 232-241.

UNCTAD, (2007). World Investement Report, United Nations Conference on Trade and Development.

UNCTAD, (2010). World Investment Report, 20th anniversary edition, United Nations Conference on trade and development.

UNCTAD, (2012). World Investment Report, 20th anniversary edition, United Nations Conference on trade and development. *Investment Country Profiles Turkey*.

Vergil H. & Çeştepe, H. (2006). Döviz Kuru Değişkenliği Ve Yabancı Doğrudan Yatırım Akımları: Türkiye Örneği, *İstanbul Üniversitesi İktisat Fakültesi Mecmuası,* 55(1), 976-986.

Vu, T.B., & Gangnes, B. (2007). Is Foreign Direct Investment Good for Growth? Evidence from Sectoral Analysis of China and Vietnam. *Santa Cruz Center for International Economics* (SCCIE) Working Paper 07-17.

Vuksic, G. (2005). Impact of Foreign Direct Investment on Croatian Manufacturing Exports. *Financial Theory and Practice,* 29(2), 131-158.

Westerlund, J. (2007). Testing for error correction in panel data. *Oxford Bulletin of Economics and Statistics*, 69, 709-748.

Zhang, K. H. (2001). How does Foreign Direct Investment Affect Economic Growth in China? *Economics of Transition,* 9(3), 679-693.