FOREIGN DIRECT INVESTMENT INFLOWS AND NET EXPORTS RELATIONSHIP IN TURKEY: AN ANALYSIS FOR THE POST 1980 PERIOD

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-Abstract-

The main purpose of this study is to detect the long-term relationship between foreign direct investment inflows and net exports in Turkey. The first section is devoted to the impact of FDI on net exports and recent developments relating to those variables in Turkey are briefly examined. In the second section, a literature survey is made to present empirical results for different countries. Finally, empirical analyses are conducted for Turkey by using a time series data for the post- 1980 period. The results reveal that there is no significant complementary relationship between FDI and net exports in Turkey but the main motive behind FDI inflows to Turkey is to gain access to local market rather than producing for foreign markets.

Key Words*:* *FDI inflows, Net exports, Cointegration test*
JEL Classification*:* F10, F23. C22

1. INTRODUCTION

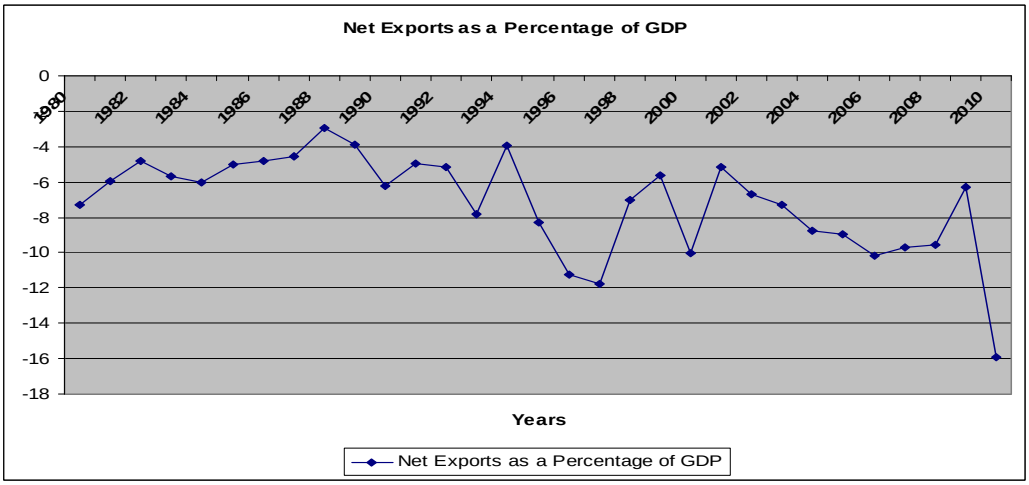
The interlinkages between FDI inflows and exports are usually complementary. Favorable trade effects may occur if multinational enterprises (MNEs) are established at the export supply point. Empirical research suggests that FDI inflows tend to increase both the exports and imports of the host country but still shows a stronger positive and complementary relationship on the export side. (WTO, 1996). But such kind of relationship is more complicated in developing countries. “The relationship between openness to trade and openness to inward FDI in developing countries is complex and ambiguous according to recent empirical evidence” (Erdilek, 2005:7). The main purpose of this study is to

examine FDI inflows and net exports relationship in Turkey for the post-1980 period. Firstly, recent developments in the worldwide and the figures relating to FDI inflows and nets exports are given in Turkey since 1980.Secondly, a brief literature survey is presented, then empirical analyses for Turkey are conducted. Finally, interpretations of the estimation results for Turkey are included.

2. FOREIGN DIRECT INVESTMENT INFLOWS AND NET EXPORTS

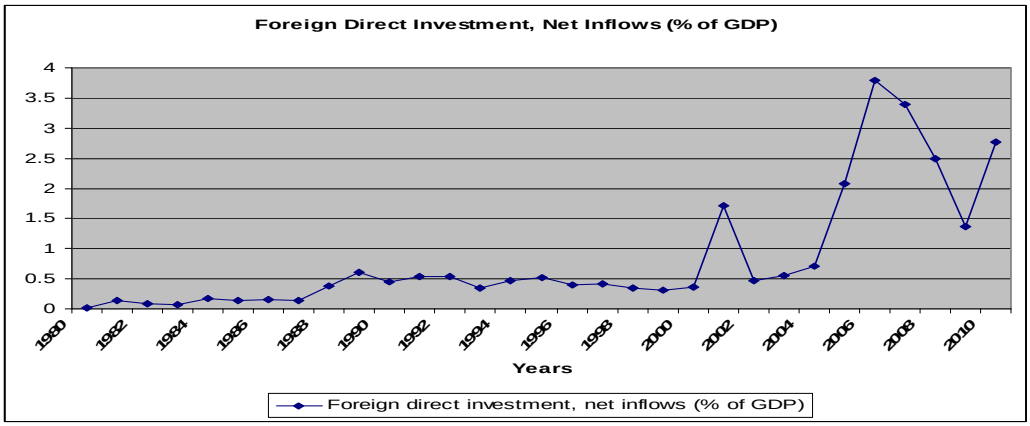
Until 2008, FDI inflows declined in most developed countries while they increased in the developing world. However, in 2008 and in the early phases of 2009 the global crisis had a particularly negative impact on developing countries. Developed countries still get the major share of global FDI inflows, receiving 57 % of global FDI inflows in 2008 (WIR, 2009, pp.3-4). Turkey also experienced similar patterns in FDI inflows and net exports with developing countries. The figures below show the FDI inflows and net exports of Turkey in the post-1980 period.

Figure 1: Turkey's Net Exports as a Percentage of GDP (1980 – 2010)



Source: TUIK. 2011. "GDP" and "Foreign Trade by Years". http://www.tuik.gov.tr

Figure 2: Turkey's Net FDI Inflows as a Percentage of GDP (1980 – 2010)



Source: TUIK. 2011. "GDP". http://www.tuik.gov.tr and TCMB. 2011. "Net Foreign Direct Investment Inflows as a Percentage of GDP". http://www.tcmb.gov.tr

3. LITERATURE SURVEY

The recent FDI theories suggest that FDIs have trade improving effects and there are many studies about net exports and FDI relationship in the empirical literature. In this paper we have tried to summarize only the most significant empirical studies in order to shed light on our research.

Table 1: Summary of Empirical Literature on FDI and Exports Relationship

Author(s)	Data Set	Methodology	Results
Chaisrisawatsuk& Chaisrisawatsuk (2007)	35 countries 1980 – 2004	*Panel Data Analysis* Simultaneous Equation System	Exports from host to home country positively affected by FDI inflows. As exports from home to host increase FDI inflows increase too.
Karagöz&Karagöz (2006)	Turkey 1991:1 – 2003:2	*Time Series Analysis* Cointegration and Granger Causality Tests	There is a relationship between FDIs and exports. The causality is from exports through FDIs.
Zhang (2005)	186 Chinese industries 1995	*Cross-Section Analysis*	FDI has a positive impact on China's export performance.
Kneller & Pisu (2004)	868 UK firms 1988 – 1999	*Panel Data Analysis* Quasi Likelihood Method	FDI positively contributes to the UK manufacturing exports.
Hsiao & Hsiao (2004)	8 countries 1986 – 2004	*Panel Data Analysis* Granger Causality Test VAR Analysis	There is one way causality from FDI through exports.

Table 1 - continued: Summary of Empirical Literature on FDI and Exports Relationship

Rothmuller (2003)	Brazil and 38 trade partners 10 goods 1996 – 2002	*Panel Data Analysis* Gravity Model	FDI has no effect on exports of manufactured goods. MNEs in Brazil have only been interested in supplying local markets.
Alici & Ucal (2003)	Turkey 1987.I – 2002.IV	*Time Series Analysis Causality Test VAR Methodology*	There is no evidence on FDI-led export growth.
Alguacil, Cuadros & Orts (2002)	Mexico 1980.I – 1999.IV	*Time Series Analysis Granger Causality Test VAR Model*	There is a positive causal relationship from FDI to exports in Mexico.
Sun (2001)	29 provinces of China 1984 – 1997	*Panel Data Analysis TSCS Model*	There are positive impacts of FDIs on exports only in coastal and central regions
Liu, Wang & Wei (2001)	20 countries 1984 – 1998	*Panel Data Analysis Causality Test*	Growth of imports causes the growth of inward FDI and growth of inward FDI causes growth of exports.
Mafusire (2001)	Zimbabwe 1967 – 1994	*Time Series Analysis Cointegration Test VAR Model*	FDI inflows contribute to export growth of Zimbabwe and also export growth attracts more FDI.
Kumar (2001)	7 sectors of 66 countries 1982 – 1994	*Panel Data Analysis Gravity Model*	Infrastructure development attracts FDI in general and export-oriented production from FDIs in particular.
Sharma (2000)	India 1970 – 1998	*Time Series Analysis TSLS*	FDI inflows have no significant impact on exports of India.
Zhang & Song (2000)	27 regions of China 1986 – 1997	*Dynamic Panel Data Analysis GLS Estimation*	Inward FDI has an important role in promoting China's exports.
Hejazi & Safarian (1999)	52 countries 1982 – 1994	*Panel Data Analysis* Gravity Model	Inward FDI has positive impact on exports but outward FDI has a larger impact on exports.
Wilamoski & Tinkler (1999)	Mexico 1977 – 1994	*Time Series Analysis* Cointegration Test VEC Model	FDI leads to increased exports and imports. But the contribution of FDI to trade is relatively small compared to other determinants of trade.
Pain & Wakelini (1997)	11 OECD countries 1971 – 1992	*Panel Data Analysis* Fixed Effects Model Estimation	The effects of FDI vary by country. However, inward FDI has generally positive impact on trade.
Leichenko & Erickson (1997)	Manufacturing sectors of 48 US states 1980 – 1991	*Panel Data Analysis* OLS Estimation Technique	Increased levels of FDI are positively related to future improvements in state manufacturing export performance.

Source: Constructed by authors.

4. THE EMPIRICAL ANALYSIS

4.1. Data Set and Variables

The data set of the first part of the empirical analysis consists of semi-annual data of FDI inflows and net exports for the time period of 1985:2 – 2011:1 in Turkey. The time period has been chosen as 1985:2 – 2011:1 due to the lack of data before 1985. Hence we have 52 observations. The main series used in the model are FDI inflows and net exports as million U.S. dollar. Net exports values have been derived from the exports and imports values of Turkey. All the data have been obtained from the Central Bank of the Republic of Turkey. In the second part of the analysis, settled and nonsettled households' consumption expenditures with constant prices and FDI inflows are used to test the relationship between domestic consumption and FDI inflows. However, in this part of the empirical analysis we use the semi-annual data for the time period of 1998:1 – 2010:2 due to the lack of data of consumption before 1998. So we have 26 observations for Turkey.

4.2. Estimation Results

Cointegration tests mainly examine the long-term relationship between the relevant variables when the series are nonstationary. Johansen (1988) developed a multivariable cointegration test and in this study we applied this test to detect the relationship between the examined variables. Hence first of all we should check the stationarity of our series in order to begin to our estimation process. Hence we apply unit root tests on our series.

Table 2: Augmented Dickey-Fuller Test Summary Table (For the Level)

Augmented Dickey-Fuller Test (For the Level)							
FDI Inflow				**Net Export**			
		t-Stat	**Probability**			**t-Stat**	**Probability**
ADF Test		-1.32048	0.6132	**ADF Test**		0.14685	0.9661
Test Critical Values (Respected Levels)	**1%**	-3.56543		**Test Critical Values (Respected Levels)**	**1%**	-3.57444	
	5%	-2.91995			**5%**	-2.92378	
	10%	-2.59790			**10% l**	-2.59992	

Table 3: Augmented Dickey-Fuller Test Summary Table (For the First Differences)

Augmented Dickey-Fuller Test (For the First Differences)							
FDI Inflow				Net Export			
		t-Stat	Probability			t-Stat	Probability
ADF Test		-4.52307	0.0007	ADF Test		-8.05272	0.0000
Test Critical Values (Respected Levels)	1%	-3.57772		Test Critical Values (Respected Levels)	1%	-3.57444	
	5%	-2.92516			5%	-2.92378	
	10%	-2.60065			10%	-2.59992	

As seen from the table 2, both series have unit root problems. So we should remedy this problem by taking differences of series. When we take first differences we reach stationary series. Consequently, we can now apply our cointegration test.

Table 4: Johansen Cointegration Test Results for FDI Inflows and Net Exports

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.000455	0.022278	15.49471	1.0000
At most 1	4.19E-34	0.000000	3.841466	0.9999
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.000455	0.022278	14.26460	1.0000
At most 1	4.19E-34	0.000000	3.841466	0.9999
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
D(FDIINF)	D(NX)			
2.92E+08	1.15E+08			
3.36E+08	1.89E-07			
Unrestricted Adjustment Coefficients (alpha):				
D(FDIINF)	-2478161.	6.86E-10		
D(NX)	6027276.	6.85E-09		
1 Cointegrating Equation(s):		Log likelihood	-2021.514	
Normalized cointegrating coefficients (standard error in parentheses)				
D(FDIINF)	D(NX)			
1.000000	0.393176			
	(2.11966)			

Table 4-continued: Johansen Cointegration Test Results for FDI Inflows and Net Exports

Adjustment coefficients (standard error in parentheses)				
D(FDIINF)	-7.25E+14	(5.4E+15)		
D(NX)	1.76E+15	(2.0E+16)		

According to Cointegration Test there is no cointegrated relationship between FDI inflows and net exports in Turkey. Our results are similar with the studies of Rothmuller (2003), Alici & Ucal (2003) and Sharma (2000). These results may be interpreted as the main motivation behind FDI inflows to Turkey is to gain access to the domestic market rather than producing for foreign markets. There are some studies in the literature indicating that MNEs invest in some developing countries to benefit from domestic markets (see Rothmuller (2003)).Another study is done by Göver's (2005); he analysed MNEs and their sales behaviors in Turkey for the time period of 1996 – 2002 by descriptive methods and found that MNEs in Turkey produced mainly for local markets between 1996 – 1999. To test whether this hypothesis is valid, we used households' domestic consumption in Turkey between 1998:1 – 2010:2. We get this time period due to the lack of data before 1998. Again firstly we apply unit root test to our series in order to check the stationarity of them.

Table 5: Augmented Dickey-Fuller Test Summary Table (For the Level)

Augmented Dickey-Fuller Test (For the Level)							
FDI Inflow				**Households' Consumption**			
		t-Stat	**Probability**			**t-Stat**	**Probability**
ADF Test		-1.36827	0.5811	**ADF Test**		-0.45784	0.8813
Test Critical Values (Respected Levels)	**1%**	-3.72407		**Test Critical Values (Respected Levels)**	**1%**	-3.78803	
	5%	-2.98622			**5%**	-3.01236	
	10%	-2.63260			**10%**	-2.64611	

Table 6: Augmented Dickey-Fuller Test Summary Table (For the Second Differences)

Augmented Dickey-Fuller Test (For the Second Differences)							
FDI Inflow				**Households' Consumption**			
		t-Stat	**Probability**			**t-Stat**	**Probability**
ADF Test Stat		-7.51709	0.0000	**ADF Test Stat**		-5.78350	0.0001
Test Critical Values (Respected Levels)	**1%**	-3.75294		**Test Critical Values (Respected Levels)**	**1%**	-3.78803	
	5%	-2.99806			**5%**	-3.01236	
	10%	-2.63875			**10%**	-2.64611	

Both series have unit root and when we take second differences, we reach to stationary series. After reaching stationarity we can apply Cointegration Test.

Table 7: Johansen Cointegration Test Results for FDI Inflows and Domestic Consumption

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None*	0.752521	33.59891	15.49471	0.0000
At most 1*	0.184146	4.273925	3.841466	0.0387
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized No. of CE(s)	**Eigenvalue**	**Max-Eigen Statistic**	**0.05 Critical Value**	**Prob.****
None*	0.752521	29.32499	14.26460	0.0001
At most 1*	0.184146	4.273925	3.841466	0.0387
Unrestricted Cointegrating Coefficients (normalized by b'*S11*b=I):				
D(FDIINF.2)	**D(CONS.2)**			
-3.32E-09	1.78E-11			
1.48E-08	-2.91E-14			
Unrestricted Adjustment Coefficients (alpha):				
D(FDIINF, 3)	52638195	-90703611		
D(CONS,3)	-1.59E+11	-3.63E+10		
1 Cointegrating Equation(s):		**Log likelihood**	-994.6604	
Normalized cointegrating coefficients (standard error in parentheses)				
D(FDIINF,2)	**D(CONS,2)**			
1.000000	-0.005346			
	(0.00077)			
Adjustment coefficients (standard error in parentheses)				
D(FDIINF,3)	-0.174974	(0.18325)		
D(CONS,3)	526.8880	(106.568)		

There is a positive cointegrated relationship between FDI inflows and households' consumption. So this result supports our assumption that MNEs invest in Turkey to produce for the domestic market rather than foreign markets.

5. CONCLUSIONS

In this study, we tried to explore the relationship of FDI inflows and net exports in Turkey for the post-1980 period. Our results reveal that there is no significant long-term relationship between those variables for the period of 1985:2 – 2011:1 in Turkey. This result has led us to investigate the relationship between domestic consumption and FDI inflows. Our cointegration test results show that in Turkey, there is a positive cointegrated relationship between domestic consumption and FDI inflows. This result may be interpreted that the basic impetus for FDI inflows to Turkey is to get access to the home market rather than producing for foreign markets. Therefore, Turkey should revise its policy to attract FDIs to export sectors and reduce the import propensity of these sectors.

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