FDI AND GDP IN TURKEY: IS THIS RELATIONSHIP SIMILAR TO EUROPE?

By

BRENT LADD

Bachelor of Science in Finance

Oklahoma State University

Stillwater, OK

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Thesis Approved:

Dr. Bilal Erturk

Thesis Adviser

Dr. David Carter

Dr. Ramesh Rao

Name: BRENT DANIEL LADD

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Abstract: This study looks at the relationship between FDI, openness to international trade, and GDP in Turkey and 13 EU countries using panel data from 1980-2012. I look at the openness of Turkey and the EU and seek to determine if FDI has a greater relationship to GDP as a country becomes more open to international trade. This study found that openness to trade and FDI had a negative, but not statistically significant relationship to GDP. The study also found FDI has a positive relationship to GDP from 1980-1996. This relationship weakened from 1997-2012.

TABLE OF CONTENTS

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER I

INTRODUCTION

Foreign Direct Investment (FDI) occurs when a company from one country invests in another country. This type of investment must have direct control and influence over the investment. It differs from portfolio investment, which does not involve control of the investment. FDI may be in the form of a subsidiary, a joint venture, or a stock purchase of 10 percent or more of the company. According to Brenton and Di Mauro, and Lucke (1999) "there are two types of FDI, horizontal and vertical. Horizontal FDI involves local production in the host country, which replaces exports to this country. Vertical FDI involves using less expensive labor abroad to replace imports of products previously produced at home." Worldwide, FDI has steadily increased over the last 30 years according to United Nations Conference on Trade and Development. The flow of FDI has generally been on an upward trend going from $13 billion in 1980 to $1.5 trillion in 2011. The stock of FDI has also increased every year except 2009. The increase in FDI is important because some studies have found a relationship between FDI and Gross Domestic Product (GDP) growth in developing and developed countries Basu, Charaborty, and Reagle (2003), Nair-Reichert and Weinhold (2001), and Zhang 2001. This contribution of FDI to economic development is still unclear and not found in all studies.

Turkey has political and economic ties to Europe. Turkey's formal association agreement with the European Union (EU) dates back to 1963 Narbonne and Tocci (2007). FDI is one manifestation of these ties. Table (1.1) shows FDI inflows to Turkey in US Dollars from 1980-2012. This study will seek to increase understanding of FDI and its relationship to GDP in the region. It will provide a better understanding of how FDI and economic growth in Turkey compares to Europe during the past 30 years. I will examine how openness as measured by international trade, affects the relationship between FDI and GDP in this region. I will also test to see if Turkey has become more open to trade during this time period as it made reforms to join the EU. Previous studies, Brenton and Di Mauro, and Lucke (1999), Bevan and Estrin (2004), and Sandalcilar and Altinar (2012) found that reforms attracted more FDI in EU accession candidate countries. I will test to see if its steps to open its economy strengthened the relationship between FDI and growth in Turkey and made it more similar to the relationship in Europe. Several studies looked at countries that were more and less open to international trade found that the growth effect of FDI was larger and lasted longer in economies that were more open to trade Basu et. al. (2003), Nair-Reichert and Weinhold (2001), and Balasubramanyam, Salisu, and Sapsford (1996). They found that less open countries received a smaller benefit from increased FDI than more open economies. Looking at this relationship can also provide a frame of reference to understand policy reforms, economic growth and the part FDI has played in this region. Narbonne and Tocci (2007) and Karatas and Uz (2009) describe the steps Turkey implemented to open its economy, history of reforms, and steps that are still needed such as further reducing high levels of inflation and current accounts deficits. The economies in Europe vary and will provide a comparison of FDI in both developed and transition countries. Together, they should provide an idea of the FDI and GDP growth that occurred during the last 30 years and help identify any relationships between the two in the region.

The purpose of this study is to test if Turkey has become more open in terms of international

trade as it implemented reforms in preparation for EU accession. Clemente, Fernando, and Sanz (2009) looked at countries that joined the EU and found that integration increased the economic growth of these countries. I will test if increased openness in Turkey strengthened the growth effects of FDI over time. The analysis should find that this occurred if the data supports theory and follows previous studies on the growth effect of FDI in more open countries.

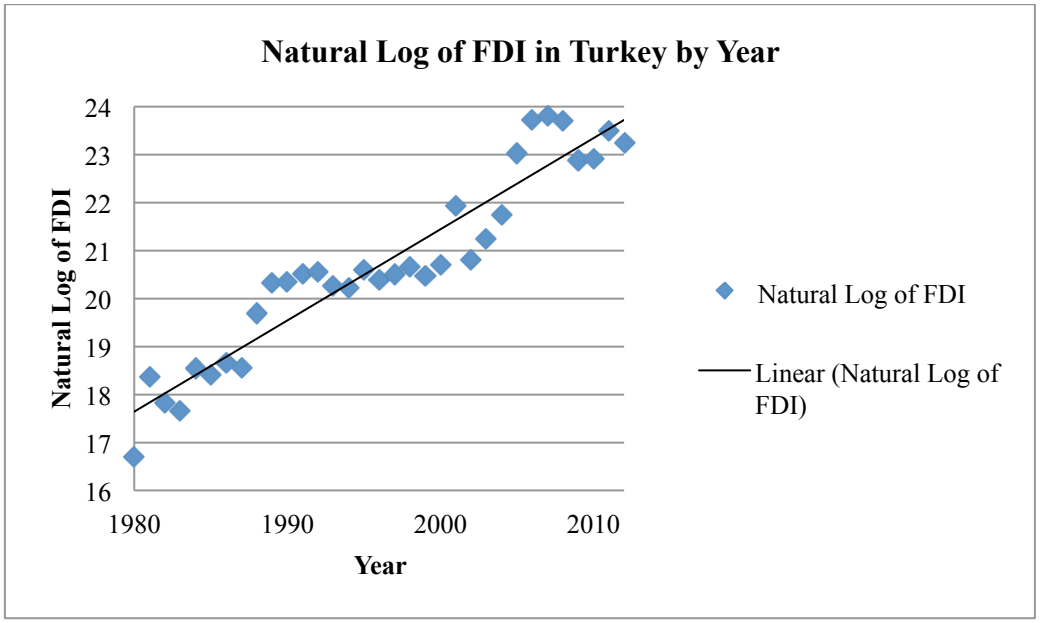
I find a relationship between FDI and GDP. I also found a weak, but not significant effect of international trade on the relationship between FDI and GDP in Turkey. I also find that FDI has a stronger relationship to GDP from 1980-1996 than in the period 1997-2012. This applied to both Turkey and the EU countries where FDI provided more growth in the earlier time period than in the later time period. It appears that Turkey became more open to trade like the EU over time. Unfortunately, this increased openness did not lead to a stronger relationship between FDI and growth in either Turkey or the EU countries. I found that more openness to international trade did not have a positive growth effect on GDP. More openness reduced growth and did not help GDP. I also looked at the relationship to FDI and balance of payments and FDI to international trade for comparison. I found that FDI has a more significant relationship to GDP than to either balance of payments or international trade.

The paper will be organized as follows. Section II is a Review of Literature on FDI and growth. Section III discusses the Methodology used to test for the relationship between FDI and GDP. Section IV analyzes the relationship between FDI and GDP in Europe and Turkey. Section V is the conclusion.

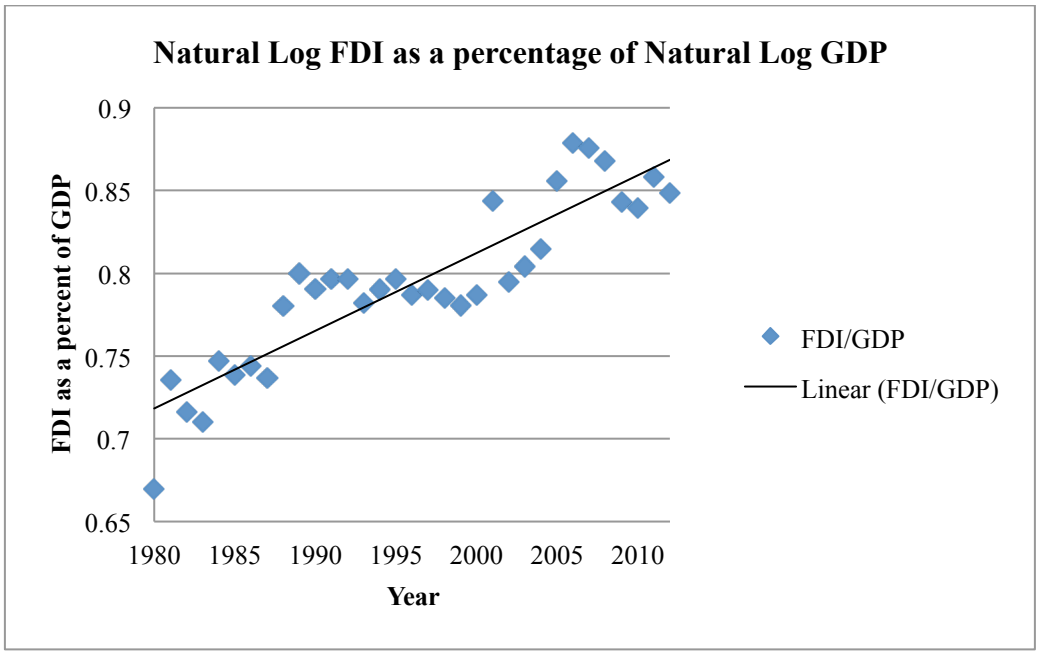
Table (1.1) FDI in Turkey

Year	FDI (Million $)	FDI as a % of GDP
1980	18	0.026%
1981	95	0.134%
1982	55	0.085%
1983	46	0.075%
1984	113	0.188%
1985	99	0.147%
1986	125	0.165%
1987	115	0.132%
1988	354	0.390%
1989	663	0.619%
1990	684	0.454%
1991	810	0.536%
1992	844	0.531%
1993	636	0.353%
1994	608	0.465%
1995	885	0.522%
1996	722	0.398%
1997	805	0.424%
1998	940	0.349%
1999	783	0.314%
2000	982	0.368%
2001	3,352	1.710%
2002	1,082	0.465%
2003	1,702	0.562%
2004	2,785	0.710%
2005	10,031	2.077%
2006	20,185	3.802%
2007	22,047	3.407%
2008	19,760	2.706%
2009	8,663	1.410%
2010	9,036	1.236%
2011	16,047	2.071%
2012	12,519	1.586%

Graph (1.1)



Graph (1.2)



CHAPTER II

REVIEW OF LITERATURE

Previous studies have discussed how countries benefit from inflows of FDI. Balasubramanyam et al. (1996) found that FDI helps develop human capital through exposure to different business practices and learning by doing. FDI also helps introduce new technologies which domestic companies are able to adopt through the spillover effect. FDI may also introduce increased competition and make domestic companies more competitive as they adapt to increased competition of foreign owned subsidiaries. (Zhang 2001) discussed the benefits of FDI includes increased capital available for investment and helps reduce balance of payments deficit. Sandalcilar and Altinar (2012) listed benefits of FDI as providing external sources of capital and introduction of technology that leads to more efficient use of resources in host countries. It can also increase income through greater Research and Development activity.

Multiple studies have analyzed the link between FDI and GDP growth. Balasubramanyam et al. (1996) looked at GDP in 46 developing countries and compared two groups based on their trade policies. One group had import substitution (IS) polices and the other group of countries had export promotion (EP) polices.

FDI exerted the strongest influence on growth in EP countries, but did not influence growth in IS countries. The study found that FDI was more effective than labor and exports in producing growth. Countries more open to trade derived greater benefit in GDP growth from FDI than countries less open to trade. Zhang (2001) also looked at 11 developing countries, but found cross country variation in the relationship between FDI and GDP. He found that 5 of the 11 countries had a unidirectional causal effect where FDI boosted growth. He found FDI was more effective in boosting growth in more open economies. His study found that FDI flows increased more in Asia than in Latin America in this time. Asia also had more open trade policy regimes, more macroeconomic stability, and a high degree of integration with world markets. Nair-Reichert and Weinhold (2001) studied 24 developing countries from 1971 to 1995. FDI was not found to be significant in the initial regression. They reran the regression and interacted FDI with an openness variable in which FDI became significant. The authors found a causal relationship between FDI and growth with the effect stronger in countries more open to trade. They agreed with Zhang (2001) and found this relationship is heterogeneous between countries. Basu et. al. (2003) looked at the relationship between FDI and GDP in 23 developing countries in Africa, Asia, Latin America, and Eastern Europe during the 1978-1996. They found a long run relationship between FDI and GDP. They found that open economies have bi-directional causality between FDI and GDP over both short and long term. Closed economies only exhibit a short term bi-directional relationship. Causality only goes from growth to FDI over the longer term in closed economies. This study included Turkey with the Eastern European countries. They found that in more open economies both the short and long run relationship between FDI and GDP is bidirectional. Sandalcilar and Altiner (2012) looked at countries in the ECO region from 1995-2011. FDI inflows increased in the same time period, which helped integrate this region into the world economy. They found a significant causality relationship from FDI to GDP over both short and long run. They did not find a causality relationship from GDP to FDI. Clemente et. al. (2009) looked at the effect of EU integration on economic growth. They found more open economies

derived greater benefit from integration and that integration helped speed up economic growth. Most of the growth effect came in the years immediately after EU accession. Countries on the periphery and less open countries received less growth benefit from integration.

Other studies have looked at GDP growth having a relationship with FDI. Globerman and Shapiro (2002) found open economies attract more FDI. Villaverde and Maza (2012) looked at determinants of FDI in 17 regions of Spain. They found a positive and significant relationship between GDP and FDI and used openness as a variable in the competitiveness factor. Based on their results making an economy more open to trade is one way to attract more FDI. Jabri, Guesmi, and Abid. (2013) found in the long term that openness and GDP growth rate have a positive relationship to FDI, while macroeconomic instability and exchange rates have a negative relationship to FDI. Tintin (2013) looked at six central and eastern European countries and found international trade and FDI are complements and being a member of the EU increased FDI. This study found openness was a determinant of FDI and reforms to institutions increased FDI inflows. Brenton et. al. (1999) tested to see if economic integration increases FDI. Their model looked at the accession of Portugal and Spain to the EU and the accession of Austria, Finland, and Sweden in 1995 and the change in FDI. They found that GDP and distance are significant for source countries. They also found more FDI in EU 10 after common market. The increase of FDI to Portugal and Spain did not decrease FDI to other European countries or from other European countries.

Some previous studies on the link between EU accession and FDI include Bevan and Estrin (2004) that looked at market and transition economies in the EU. The authors found that the size of the host country economy and EU accession announcements have a positive effect on FDI. They also found that transition policies in a host country could lead to virtuous or vicious cycles. Reforms can attract more FDI, which creates an incentive for additional reform that makes FDI more attractive. Tintin (2013) found that strong institutions have a significant relationship with

FDI inflows for central and Eastern European countries. Globerman and Shapiro (2002) looked at governance infrastructure and its impact on FDI inflows and outflows in developed and developing countries. They defined this infrastructure as institutions, policies, and legal environment. Governance was most important in attracting FDI to developing countries, while human capital more important in attracting FDI to developed countries. The authors also found regulatory burden and economy size are important determinants of FDI.

Narbone and Tocci (2007) discussed the history of Turkey's reforms and movement to increase integration with the European Union. Turkey first signed an association agreement with the EEC in 1963. They made their first application to the European community in 1987, which was rejected in 1989. Turkey successfully joined the EU customs union in 1996. They became an accession candidate at the Helsinki European Council in 1999. This candidacy prompted them to start making reforms in 2001. In 2002, they adopted the Copenhagen criteria, which were European inspired reforms that would lead to EU accession. Turkey made the most reforms during the 2003-2004 period. Reforms included reducing the deficit and adjusting the exchange rate. There were additional reforms including budget cuts and more privatization. According to the authors, the government "reduced fiscal imbalances and accompanying reduction in interest rates. It also liberalized electricity, reduced agriculture subsidies, reformed the banking system, and strengthened independent regulatory structures." They began EU accession negotiations in 2005. These negotiations were suspended in 2006 and completely broke down in 2007 and 2008. The pace of reform has varied over time. Change was viewed as legitimate when trust existed towards the EU. The desire to join the EU led to needed reforms, but if the EU does not let Turkey join, these reforms might not last. Turkey needs to join in order to continue to benefit from increased FDI and sustained growth made possible by the reforms. In times of distrust of the EU, reforms were viewed more negatively. These reforms have often been a battle between progressive and conservative members of society.

Karatas and Uz (2009) discussed the history of EU and Turkish relations. They described policy reforms such as reducing the budget deficit and decreasing the monetary supply that were made to meet conditions for EU accession. They also listed impediments to accession including debt to GDP levels, high inflation rates, current account deficits, and high unemployment rates. They found interest and domestic debt were significant and these macroeconomic variables have a long-term relationship with national production. The financial sector needs to develop alongside the economy due to its role maintaining macroeconomic stability.

CHAPTER III

METHODOLOGY

This study uses panel data from 14 countries. It uses data from the European Union 15 countries, which includes all countries that joined the EU up to 1995, and Turkey. Belgium and Luxembourg are omitted due to missing data for FDI and GDP. Previous studies on FDI in Europe that used the EU 15 countries as their definition for Europe include Tintin (2013) and Clemente et. al (2009). This study uses two World Bank world development indicators: Gross Domestic Product (GDP) and Foreign Direct Investment (FDI). GDP is measured in current US dollars. FDI is net inflows of FDI measured in US dollars using current prices and exchange rates. This study uses the natural log of FDI and GDP in all regressions. Data for two additional variables comes from the United Nations Conference on Trade and Development (UNCTAD). They were the openness to international trade (TRADE) variable measured as the imports and exports of goods and services as a percentage of GDP. Balance of Payments (BOP) is the goods and services trade balance indicator. It is a percentage and defined as (total exports minus total imports) divided by total trade (exports plus imports). TIME is a dummy variable used to split the study into two time periods. The two time periods are 1980-1996 and 1997-2012. TURKEY is a dummy variable that separates Turkey and the EU countries into two different groups.

Brenton et. Al. (1999) uses dummy variables in their study to look at the data over different time frames and across different groups of countries. Separating countries and time frames will assist in comparing the growth effect of FDI and TRADE across groups and time periods.

The Im Peseran Shin (IPS) test is used to test for unit roots. In this test, the null hypothesis is all panels have a unit root. The variables are found to contain a unit root after running this test on each variable. New variables are created to account for non-stationarity by taking the first difference of the original variables. IPS tests were run on the differenced variables and none of the variables contained unit roots. All regressions are run using differenced variable. This method follows other studies including Basu et. al. (2003) and Sandalcilar and Altinar (2012). The models used in this study are:

$$GDP = B_0 + B_1 FDI_{Y-1} + B_2 TRADE_{Y-1} + B_3 TURKEY + B_4 TIME_{Y-1} + \mu \quad (3.1)$$

$$GDP = B_0 + B_1 FDI_{Y-1} + B_2 FDI_{Y-1}\, x\, TURKEY\, x\, TIME + B_3 TURKEY + B_4 TIME + \mu \quad (3.2)$$

$$GDP = B_0 + B_1 FDI_{Y-1} + B_2 FDI_{Y-1}\, x\, TRADE\, x\, TIME + B_3 TRADE_{Y-1} + B_4 TIME + \mu \quad (3.3)$$

$$GDP = B_0 + B_1 FDI_{Y-1} + B_2 FDI_{Y-1}\, x\, TURKEY\, x\, TRADE_{Y-1} + B_3 TURKEY + B_4 TRADE_{Y-1} + \mu \quad (3.4)$$

GDP is the dependent variable. All regressions use lagged versions of independent variables to account for their relationship with GDP in a later time period. Zhang (2001) and Basu et. Al. (2003) both used lagged independent variables in their studies. Two models also include an interaction term of FDI x TRADE. This follows the methodology of Nair-Reichert and Weinhold (2001). This study uses four models. Each model includes GDP as the dependent variable. The independent variables include FDI, TRADE, TURKEY, TIME and an interaction term. Model (3.1) includes all independent variable, but does not have an interaction term. Models (3.2)

through (3.4) include three way interaction terms to compare between countries and time periods. Model (3.2) includes lagged FDI, TURKEY, and TIME dummy variables. It also includes interactions of FDI x TURKEY, FDI x TIME, TURKEY x TIME, and FDI x TURKEY x TIME. Model (3.3) includes FDI, TIME, TRADE, and interactions of FDI x TIME, FDI x TRADE, TRADE x TIME, and FDI x TRADE x TIME. Model (3.4) includes FDI, TRADE, TURKEY, and interactions of FDI x TURKEY, FDI x TRADE, TRADE x TURKEY, and FDI x TRADE x TURKEY.

Additional regressions are run with Balance of Payments (BOP) and TRADE used as dependent variables. These regression results are shown to compare the relationship of FDI and GDP to the relationship between FDI and TRADE and FDI and BOP.

Table (3.1) Summary Statistics for Turkey

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP (Billions)	33	281	238	60	789
FDI (Billions)	33	4.17	6.64	0.018	22
BOP (%)	33	-6.9001	8.1750	-38.1184	6.0949
FDI/GDP (%)	33	0.8610	0.9724	0.0261	3.8020
TRADE (%)	33	35.8862	13.0085	12.6551	57.6128

Table (3.2) Summary Statistics for EU countries

Variable	Obs	Mean	Std. Dev.	Min	Max
GDP (Billions)	429	653	776	19.7	3620
FDI (Billions)	428	15.2	31.1	-25.3	262
BOP (%)	429	-0.234	8.0026	-35.1293	13.7847
FDI/GDP (%)	428	2.6014	4.318	-6.7438	26.6532
TRADE (%)	429	70.80798	30.79128	29.61124	201.8267

CHAPTER IV

RESULTS

Table (4.1) shows the interaction of TIME x Turkey with log FDI as the dependent variable. These results show how FDI differed in Turkey and the EU during the first and second time periods. The results show that FDI was greater in the EU than in Turkey. FDI was greater in the second time period of 1997-2012 than in the first period for both Turkey and the EU. The results of the four models are shown in table (4.2). These results are from one model without interactions and three models that included interactions. The results for Model (3.1) show that only the TIME dummy variable was significant. In the second time period (1997-2012) this dummy variable has a negative relationship to GDP. GDP grew faster in the earlier time period (1980-1996) than in the second time period. FDI and TURKEY had a very small and positive relationship to GDP meaning that FDI had a bigger growth effect on GDP in Turkey than in the EU. The TRADE variable had a small, but negative relationship to GDP, which was not expected. This would suggest that countries more open to trade had slower GDP growth than less open countries. FDI, TURKEY, and TRADE were not significant in this model.

Two independent variables and two interactions were significant in Model (3.2). It included FDI, TURKEY, and TIME for independent variables. In this model, FDI had a positive and significant relationship to GDP.

This is consistent with other literature that finds FDI contributes to GDP growth. Countries that received more FDI have economies that grew more than countries that receive less FDI.

Table (4.1) Interaction of Turkey x TIME with FDI as dependent variable

VARIABLES	(1) FDI
Turkey	-1.783***
	(0.377)
TIME	2.292***
	(0.148)
Turkey x TIME	0.620
	(0.541)
Constant	21.053***
	(0.102)
Observations	444
R-squared	0.407
F Test	100.6

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The coefficient for FDI increased in the regressions with interactions suggesting that when additional variables were interacted with FDI the growth effect on GDP strengthened. The TIME dummy variable was significant, but had a negative sign. This suggests that GDP grew more quickly in the earlier time period than in the later time period. This relationship held for both Turkey and the EU. The interaction between FDI and TIME was significant and had a negative sign. FDI contributed more to GDP in the years 1980-1996 than in the later years of 1997-2012. FDI apparently contributed to GDP in the first time period, but in the later years, this contribution decreased. The second significant interaction was between TIME and TURKEY. This interaction had the largest coefficient in this model. Each of the dummy variables by itself had a negative sign, but the interaction had a positive sign. GDP in Turkey grew faster than in the EU countries during the later time period. The interaction between TURKEY and FDI also had a positive

coefficient so FDI may contribute more to GDP in Turkey than in the EU countries. This interaction was not significant.

Two independent variables and one interaction were significant in Model (3.3). It included FDI, TIME, and TRADE for independent variables. The relationships of FDI, TIME, and the interactions of TIME to GDP were similar in Models (3.2) and (3.3). TIME maintained a negative relationship to GDP, but became less significant. GDP grew less in the later time period. This model added the TRADE variable and dropped the TURKEY variable. The TRADE variable may increase GDP, but was not significant. The FDI and TRADE interaction had a small negative coefficient in this model. This may suggest that TRADE did not strengthen the relationship of FDI to GDP and FDI did not contribute to GDP in more open countries. This interaction was not significant. The interaction of FDI and TRADE had the opposite results of the study by Nair-Reichert and Weinhold (2001), where FDI was insignificant, but became significant when interacted with TRADE in a second regression. The other study used developing countries where this study mostly used developed countries.

Model (3.4) added TRADE to FDI and TURKY and dropped the TIME variable. In this model, FDI had a small and positive contribution to GDP. The TRADE variable had a small and negative coefficient. TRADE did not help GDP grow. The interaction of FDI and TURKEY was positive in this model suggesting that FDI helped GDP grow more in Turkey than it did in the EU countries. The interaction of FDI and TRADE also had a positive coefficient, where TRADE alone had a negative coefficient. There may be a small, but positive relationship to GDP when FDI and TRADE are interacted. Openness to trade may increase the growth effect of FDI on GDP. These results are inconclusive as none of the variables or interactions was significant in this model.

Table (4.2) Interaction of FDI, Turkey, and TIME with GDP as dependent variable

VARIABLES	(3.1) ΔGDP	(3.2) ΔGDP	(3.3) ΔGDP	(3.4) ΔGDP
ΔFDI_{Y-1}	0.006	0.021*	0.022*	0.006
	(0.006)	(0.011)	(0.011)	(0.006)
Turkey	0.021	-0.021		0.023
	(0.021)	(0.032)		(0.023)
ΔFDI_{Y-1} x Turkey		0.032		0.018
		(0.051)		(0.037)
Time	-0.026**	-0.028**	-0.022*	
	(0.011)	(0.012)	(0.011)	
ΔFDI_{Y-1} x Time		-0.023*	-0.024*	
		(0.013)	(0.013)	
Turkey x Time		0.073*		
		(0.044)		
ΔFDI_{Y-1} x Turkey x Time		-0.037		
		(0.068)		
$\Delta TRADE_{Y-1}$	-0.001		0.000	-0.001
	(0.001)		(0.002)	(0.001)
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$			-0.001	0.001
			(0.003)	(0.001)
$\Delta TRADE_{Y-1}$ x Time			-0.002	
			(0.003)	
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$ x Time			0.003	
			(0.003)	
$\Delta TRADE_{Y-1}$ x Turkey				-0.010
				(0.007)
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$ x Turkey				0.008
				(0.010)
Constant	0.070***	0.069***	0.068***	0.057***
	(0.008)	(0.008)	(0.008)	(0.006)
Observations	399	399	399	399
Number of countries	14	14	14	14
R-squared	.021	.035	.035	.017
F Test	.	.	.	.

Standard errors in parentheses
*** P<0.01, ** P<0.05, * P<0.1

Table (4.3) shows the results of the regressions run with Balance of Payments (BOP) as the dependent variable. FDI, TRADE, TURKEY, and TIME were used as independent variables. Models (3.6) through (3.8) included interaction terms. Model (3.5) did not have any interaction

terms and had only one significant variable, TRADE. It had a small and positive relationship to BOP. TRADE improved the balance of payments for all countries in this study. The relationship of FDI to BOP was smaller and less significant than FDI to GDP, but remained positive. FDI helped GDP growth more than it improved BOP. The dummy variables also compared in a similar manner. They had the same signs in (3.1) and (3.5), but the relationship was stronger when GDP was the dependent variable. In Model (3.5), neither dummy variable was significant where TIME was significant in the GDP dependent model. Any possible relationship between the dummy variables, TIME and TURKEY, and BOP was not meaningful.

Model (3.6) introduced interaction terms. TURKEY had a smaller coefficient and the sign changed to positive. Turkey had a better BOP than the EU countries. TIME had a much smaller coefficient, but remained negative. BOP was better for all countries in the earlier time period. The interaction of TURKEY and FDI had a smaller coefficient and the sign changed to negative when BOP was the dependent variable. FDI in Turkey worsened balance of payments. The FDI and TIME interaction had a much smaller coefficient, but it was positive in this model and negative when GDP was the dependent variable. FDI improved BOP in the second time period, where FDI decreased GDP in the second time period. None of the variables or interactions was significant in this model.

Model (3.7) dropped TURKEY and added the TRADE to FDI and TIME variables. TIME and TRADE kept the same signs when compared to Model (3.3). TIME was much smaller in the BOP dependent model, but the TRADE coefficient was very small in both GDP and BOP dependent models. BOP decreased in the later time period. TRADE possibly increased BOP. The interaction of FDI and TIME have a much smaller relationship to BOP than GDP. The sign was positive in the BOP dependent model and negative in the GDP dependent model. FDI may have improved BOP in the second time period, while it hurt GDP in the second time period. None of the variables or interactions was significant in this model.

Table (4.3) Interaction of FDI, Turkey, and TIME with BOP as dependent variable

VARIABLES	(1) 3.5 ΔBOP	(2) 3.6 ΔBOP	(3) 3.7 ΔBOP	(4) 3.8 ΔBOP
ΔFDI_{Y-1}	0.016	-0.041	0.020	0.013
	(0.158)	(0.291)	(0.292)	(0.159)
Turkey	0.064	0.742		-0.614
	(0.535)	(0.845)		(0.600)
ΔFDI_{Y-1} x Turkey		-0.143		-0.004
		(1.334)		(0.952)
Time	-0.402	-0.277	-0.394	
	(0.288)	(0.304)	(0.296)	
ΔFDI_{Y-1} x Time		0.088	0.039	
		(0.349)	(0.349)	
Turkey x Time		-1.494		
		(1.149)		
ΔFDI_{Y-1} x Turkey x Time		1.567		
		(1.786)		
$\Delta TRADE_{Y-1}$	0.051**		0.048	0.041
	(0.024)		(0.057)	(0.030)
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$			0.062	-0.009
			(0.084)	(0.029)
$\Delta TRADE_{Y-1}$ x Time			0.017	
			(0.067)	
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$ x Time			-0.090	
			(0.090)	
$\Delta TRADE_{Y-1}$ x Turkey				0.594***
				(0.174)
ΔFDI_{Y-1} x $\Delta TRADE_{Y-1}$ x Turkey				-0.171
				(0.254)
Constant	0.424**	0.414*	0.427**	0.235
	(0.210)	(0.220)	(0.213)	(0.151)
Observations	399	399	399	399
Number of countries	14	14	14	14
R-squared	.015	.011	.018	.041
F Test	.	.	.	.

Standard errors in parentheses
*** P<0.01, ** P<0.05, * P<0.1

Model (3.8) included FDI, TRADE, and TURKEY variables. The interaction of TRADE and TURKEY was the only significant variable in this model. It had a small, positive relationship to BOP, while this interaction had a larger, negative, and insignificant relationship to GDP.

Trade helped improve BOP more for Turkey than the EU countries. FDI, TURKEY, and TRADE all exhibited smaller relationships to BOP, than to GDP. In the GDP dependent model TURKEY had a positive relationship and TRADE had a negative relationship. In the BOP model, TRADE was positive and TURKEY has a negative relationship. EU countries had better BOP than Turkey. These models show variables and interactions in which FDI has a much smaller and not statistically significant relationship to BOP when compared to similar relationships between FDI and GDP. FDI may have contributed less to balance of payment improvement than to GDP growth.

Table (4.4) shows the results of regressions run with TRADE as the dependent variable. FDI, TURKEY, TIME, and BOP were used as independent variables. Model (3.9) did not include an interaction. Models (3.10) through (3.12) included interactions of the independent variables. FDI, TURKEY, TIME, and BOP all had a positive relationship to TRADE in Model (3.9). These variables may have contributed to increased openness to trade, but were insignificant. Only TIME was significant in this model. This means countries were more open to trade in the second time period than in the first.

Model (3.10) included FDI, TURKEY, TIME, and interactions of these variables. TIME was the only significant variable in this model. This suggests all countries were more open to trade in the later time period. FDI had a negative relationship to TRADE, but had a positive relationship to GDP in the GDP dependent model. Increased FDI reduced countries openness to trade where it increased GDP in the other model. The interaction of TURKEY and FDI also had a negative relationship to TRADE, but a positive relationship to GDP. FDI in Turkey reduced openness to trade compared to EU countries. FDI increased GDP in Turkey more than in the EU countries. The interaction of FDI and TIME had a positive relationship to TRADE. FDI in the second period increased openness to trade versus the first period. This model produced similar, but not significant relationships to TRADE when compared to the GDP dependent model.

Table (4.4) Interaction of FDI, Turkey, and TIME with TRADE as dependent variable

VARIABLES	(1) 3.9 ΔTRADE	(2) 3.10 ΔTRADE	(3) 3.11 ΔTRADE	(4) 3.12 ΔTRADE
ΔFDI_{Y-1}	0.388	-0.214	-0.218	0.487
	(0.326)	(0.601)	(0.592)	(0.335)
Turkey	0.451	1.486		0.869
	(1.111)	(1.747)		(1.180)
ΔFDI_{Y-1} x Turkey		-0.414		-1.418
		(2.757)		(2.147)
Time	1.241**	1.171*	1.079*	
	(0.599)	(0.629)	(0.609)	
ΔFDI_{Y-1} x Time		0.902	0.957	
		(0.722)	(0.716)	
Turkey x Time		-1.544		
		(2.376)		
ΔFDI_{Y-1} x Turkey x Time		-0.909		
		(3.691)		
BOP_{Y-1}	0.108		0.170	0.308**
	(0.099)		(0.128)	(0.136)
ΔFDI_{Y-1} x BOP_{Y-1}			-0.057	-0.266
			(0.182)	(0.194)
BOP_{Y-1} x Time			-0.080	
			(0.238)	
ΔFDI_{Y-1} x BOP_{Y-1} x Time			-0.140	
			(0.261)	
BOP_{Y-1} x Turkey				-0.491**
				(0.223)
ΔFDI_{Y-1} x BOP_{Y-1} x Turkey				0.408
				(0.289)
Constant	0.099	0.196	0.218	0.642**
	(0.439)	(0.454)	(0.441)	(0.316)
Observations	399	399	399	399
Number of countries	14	14	14	14
R-squared	.016	.019	.023	.021
F Test	.	.	.	.

Standard errors in parentheses
*** P<0.01, ** P<0.05, * P<0.1

Model (3.11) includes FDI, TIME, and BOP, and interactions as independent variables. FDI had negative relationship to TRADE in this model compared to a positive relationship to GDP. FDI reduces openness to trade, but increased GDP. TIME was the only significant variable. The

interaction of FDI and TIME had a positive coefficient in the BOP model meaning FDI improved BOP more in the second time period than in the first. This contrasts with the interaction of FDI and TIME, which had a negative relationship to GDP. FDI improved GDP in the early time period while FDI increased openness to trade in the later time period.

Model (3.12) included FDI, TURKEY, BOP, and interactions as independent variables. BOP had a positive relationship and increased TRADE in this model. BOP in Turkey increased TRADE more than it did in EU countries. BOP and the interaction of BOP and TURKEY were the only significant variables. The interaction of FDI and TURKEY had a positive relationship to TRADE. FDI may have increased TRADE more in Turkey than in the EU. The interaction of the two switched the sign where FDI and TURKEY alone had a positive relationship to TRADE, but became negative when interacted. FDI may increase TRADE more in EU than in Turkey. This differs where there was a positive relationship for FDI to GDP in both EU and Turkey in Model (3.4). FDI and none of the interactions with FDI were significant.

CHAPTER V

CONCLUSION

I tested for a relationship between foreign direct investment (FDI) and openness to trade to gross domestic product (GDP) in Turkey and tried to compare this relationship to EU countries. Several surprising results came from this study. I found that FDI had a positive relationship to GDP in Turkey in the first period of 1980-1996. The relationship changed and FDI reduced GDP during the second time period. This would suggest that FDI helped GDP growth in the earlier years, but ceased to help GDP grow in the later time period of 1997-2012. This may suggest that the spillover effect of new technologies and increased competitiveness from FDI may have been smaller than the effect of less competitive Turkish businesses closing down. Another interesting result is from openness to international trade, which produced a drag on GDP as countries became more open to trade and integrated into the world economy. This did not agree with other studies that found a greater growth effect of FDI on GDP in more open countries. This negative relationship is not meaningful. One reason I may not have found the expected results is the use of only 30 years of data. Future studies could look at openness to international trade in Turkey for a longer time period than 30 years. If this data became available for a longer period of time, perhaps 50 to 100 years, a future study would be able to test for the relationship and possibly find a significant relationship where my study did not find one.

Another consideration is that I only looked at the short-term relationship between FDI and GDP and how it changed from year to year. Future studies could examine and compare this relationship in Turkey and the EU over longer multi-year time periods. A future study that looked at this relationship over many years may find quite different results from this study.

I did not find the expected relationships between FDI, openness to trade, and GDP. More research was conducted to check for relationships between FDI and balance of payments and FDI and openness to trade. These additional findings were used for comparison. FDI did not have a meaningful relationship to balance of payments and did not improve balance of payments. Ialso compared openness to international trade and GDP. The same tests were conducted with different factors. I found that FDI had a greater effect on GDP than with either balance of payments or openness to trade. This finding was interesting since FDI may be used to substitute for imports from another country or to increase exports to the source country of the FDI. This would suggest that Turkey should focus on FDI that is export oriented rather than FDI that replaces imported goods. It may also want to examine FDI policies in place from 1980-1996 as this period saw a stronger growth effect of FDI on GDP than in more recent years. Increased exports as a percentage of GDP should also increase openness to trade. This openness to trade measured countries integration into the world economy. A surprising result of I found was FDI did not have a meaningful relationship with openness to trade while the relationship of FDI to GDP was significant. The relationship of FDI to GDP suggests that FDI helped GDP grow, but may not have increased exports. There was a weak relationship between FDI and openness to trade to GDP in Turkey, but this relationship was not meaningful. The relationship between FDI and openness to trade to GDP in the latter half of the study was positive, but not meaningful. It would be helpful to look at this relationship over a longer time period to test if any relationship exists.

In conclusion, I did not find a meaningful relationship between FDI, openness to trade, and GDP in Turkey. Turkey was similar to the EU countries since these countries did not have a

meaningful relationship between FDI, openness to trade, and GDP either. I did not find a significant relationship between FDI and openness to trade to GDP in either time period. The relationship between FDI and GDP weakened after 1996. The relationship between FDI and GDP weakened over time and was the most surprising result. Turkey also shared this with the EU. The relationship between FDI, openness to trade, and GDP may have become more like EU over time. Unfortunately, this was not an advantage.

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APPENDIX A

List of EU Countries

The EU countries used in this study were: Austria, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, and the United Kingdom. This list consists of the countries that joined the EU up to 1995. Belgium and Luxembourg were omitted due to missing data on FDI.

VITA

Brent Daniel Ladd

Candidate for the Degree of

Master of Science

Thesis: FDI AND GDP IN TURKEY: IS THIS RELATIONSHIP SIMILAR TO EUROPE?

Major Field: International Studies

Biographical:

Education:

Completed the requirements for the Master of Science in International Studies at Oklahoma State University, Stillwater, Oklahoma in May, 2014.

Completed the requirements for the Bachelor of Science in Finance at Oklahoma State University, Stillwater, Oklahoma in 2005.

Experience:

Honors College Advisor, Oklahoma State University, Stillwater, Oklahoma from January, 2009 to Present.

Teacher of English as a Second Language, United States Peace Corps, Azerbaijan from June, 2006 to September, 2008.