Consideration of Relationship between Unconventional Monetary Policies and FDI Inflows to Emerging Market Economies

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ABSTRACT

This study considered the effects of European Central Bank announcements of unconventional monetary policy on the foreign direct investment inflow to Turkey as an emerging country in 2002-2012. Approximately fifty announcements (events) regarding the unconventional monetary operations were determined. The event-study analysis was employed to evaluate the effects by using the financial development index. The study concluded that the unconventional monetary policies which announced by ECB affect FDI to Turkey in different directions. Specially, Securities Markets Programme and the extensions of the list of the collateral asset were found to be effective in increasing the foreign direct investment to Turkey among the different types of non standard policies.

Keywords: unconventional monetary policy, event-study, foreign direct investment

ÖZ

Bu çalışma ECB’nin 2002-2012 döneminde gelişmekte olan bir ülke olarak Türkiye’ye doğrudan yabancı yatırım girişi üzerinde geleneksel olmayan para politikalarının etkilerini gözönüne alır. Geleneksel olmayan para işlemleri ile ilgili yaklaşık elli kadar duyuru (olay) saptanmıştır. Bu çalışma analizi finansal gelişmişlik endeksi kullanılarak etkilerinin değerlendirilmesi için uygulanmıştır. Çalışma ECB tarafından duyurulan geleneksel olmayan para politikalarının Türkiye’ye doğrudan yabancı yatırımını etkilediği sonucuna varmıştır. . Özellikle, politikaların farklı türleri arasında, Menkul Kıymetler Piyasası Programı ve teminat varlıkların listesinin uzantıları hakkında haberlerin Türkiye'ye doğrudan yabancı yatırımın artırılmasında etkili olduğu bulunmuştur.

Anahtar kelimeler: geleneksel olmayan para politikası, olay çalışması, doğrudan yabancı yatırım

DEDICATION

I wish to dedicate my dissertation work to my family. A special feeling of gratitude to my loving parents and sister, whose support and encouragement were endless, they never left my side and are very special.

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LIST OF SYMBOLS/ABBREVIATIONS

- Adjusted Dickey Fuller (ADF)
- Aggregate Demand (AD)
- European Central Bank (ECB)
- European Investment Monitor (EIM)
- Extensions of the List of Collateral Assets (COLL)
- Fillips Perron (PP) Unconventional Monetary Policies (UMP)
- Financial Development Index (FD)
- Fixed Rate Tenders with Full Allotment (FRTFA)
- Foreign Direct Investment (FDI)
- Gross Domestic Product (GDP)
- Labeled Outright Monetary Transactions (OMT)
- Liquidity Provisions in Foreign Currencies (FOR)
- Long Term Refinancing Operations (LTRO)
- Money and Quasi (M2)
- New Keynesian Framework (NK)
- Outright Purchases of Covered Bonds (CBPP)
- Securities Market Programme (SMP)
- Total Factor Productivity (TFP)

Chapter 1

INTRODUCTION

Discussion about the contribution of monetary policy to different aspects of the economy has been the subject of policy discussions for a long time. Understanding the manner that monetary policy affects the economy is vital for calibrating. To settle the appropriate instruments, the moment of policy introduction should be determined by decision-makers with high precision and its effects onto the real sphere.

Monetary policy, in case of economic slowdowns, can be used for the first line of defense because it has the advantages of the central bank's ability to act faster than the fiscal policy. It is also able to judge the appropriate timing and magnitude of the stimulus more accurately (Elmendorf, 2008).

At the onset of crisis with accompany of different risks such as the deflation and even the decline of the economy growth, the monetary policy attracts more interest to overcome the malfunction of the economic circumstances.

Monetary policy can be one of the important determinants in the investment condition; accordingly, the effect of these policies can be transmitted to economy through stimulating the future expectations regarding the economic variables such as the inflation and the interest rate (OeNB).

In addition to this responsiveness, the fragility of the financial system in emerging the markets, high volatility of private capital flows to these destinations and mainly the adverse effect of the financial crisis are seen as a reason for the increasing attention to consider the monetary policy effect on the private capital flow in emerging markets.

Considering the three types of private capital flows including the foreign direct investment, bank loans and portfolio investment; FDI has absorbed a higher attention since the mid-1990s and also FDI has received a greater portion of total private capital flows in the emerging markets in comparison to other types (Frenkel, Funke, & Stadtmann, 2004).

Monetary policy effect on the economic growth is an essential debate in macroeconomics. By using the endogenous growth theory, many economists try to find out the relationship between the monetary policy and the long term economic growth. In particular, there are several studies, such as Marquis and Reffett (1991), Wang and Yip (1992), contemplating the effect of the inflow of money to the economy on inflation changes.

The impact of inflation on the economic growth has considered a number of literatures and described three different directions: neutral, positive and negative. Sidrauski in the mid-20th century provided evidence which determined the neutral effect of money "*contemplating real money balances (M/P) in the utility function*". In contrast, James Tobin (1956) revealed that the inflation has a positive effect on growth. The anti-Tobin effect (negative) was mentioned in 1981 by stockmen who demonstrated that money is complementary to capital.

In general, due to the insufficient evidence, policy makers cannot rely on the rising growth by means of increasing inflation[1]. On the opposite side, some theoretical arguments and empirical evidences agreed on price stability substantial affect the sustainable growth (Papademos, 2003).

Recent global financial crisis raised various uncertainties about the effect of conventional monetary policies. After the increase in inflation in 2007 and its continuation in 2008, economist concluded that the familiar precept that relies on the effect of inflation on real GDP (see Taylor, 1993 and Svensson, 1997) might be insufficient to face the recent circumstances.

During the financial crisis, implementing standard monetary policy will face more complexity. Firstly, this situation can be due to the decrease in central bank's ability of controlling the short-term interest rates in the interbank market which caused by impaired demand of liquidity between the depository institutions and money supply of the central banks. Secondly, the disruptions in other part of the financial market can impede the monetary impulse transmission and finally, when the effect of the crisis on the real economy is large, the zero lower bound for interest rates can become a binding constraint for monetary policy decisions. (Cecioni, Ferrero, & Secchi, 2011).

In this situation, the Federal Reserve and a number of central banks (such as the European Central Bank) need to resort the unconventional monetary policies (UMP) to provide a stimulus in order to aggregate the demand and regain the control on the economy.

[1] For example (Feguson, 2003)

These so-called unconventional policy tools have been both necessary because of the extraordinary nature of the financial crisis, and because the policy rate was quickly dropped to its effective lower bound of near zero percent (Glick & Leduc, 2013). In comparison to the traditional interest rate policy, unconventional monetary policies impulse considerable changes in the balance sheet structure of central banks (in size, composition and risk profile terms) (Bossone, 2013).

These policies which implicated the substantial expansion of central bank assets and liabilities were destined to three important aims, first address dysfunctions in the financial system, second reduce the interest rates along the term structure, and third foster the flow of credit to households and businesses.

According to Ben Bernanke, et al., (2004), central banks can employ different policies to stimulate the economy that can be grouped into three following parts:

(1) Forward guidance; (2) Expanding balance sheet size of central bank (quantitative easing) (3) Changing the central bank's balance sheet composition.

In particular, unconventional monetary policy affects the key elements of public's investment consumption decision which are *credit market conditions* and *long-term interest rates.* Interest rate reduction will lead to decrease the borrowing cost, and consequently, affect investment decisions (Cecioni, Ferrero, & Secchi, 2011).

Krugman (1998) claims that when the zero lower bound binds, the central bank should follow an "irresponsibility principle"[2]. Eggertsson and Woodford (2003)

[2] that is, convince the market that it will allow prices to raise so to increase inflationary expectations

inserted this result in the New Keynesian (NK) framework concluding that signaling is the only channel that is effective.

Gürkaynak et al., (2005) by using an event study methodology and high-frequency data, demonstrated that the signaling channel is substantially effective in moving the expectations and the yield curve. In line with them, Brand et al. (2010) also tended to reach similar conclusions using Euro area data.

On the other hand, Bernanke (2008) suggests to reduce the longer-term interest rates through the portfolio balance channel, LSAP[3], while Bauer, et al. (2011) states that signaling channel is more efficient than the portfolio balance channel and quantitative easing will be more effective in virtue of the signaling channel (also see Kocherlakota, 2010) .

In the US and the UK the efficiency of unconventional monetary policies has been analyzed in various scopes, while the studies on European Central Bank are inadequate. Accordingly, Abbassi, et al. (2011) constructed a study to illustrate the effect of ECB unconventional monetary policies on interbank rates. Additionally, Angelini et al. (2011) studied on money market rate to uncover the relationship between nonstandard monetary policies. Peersman G. (2011) also evaluated the bank credit volumes. However, there is no study carried on the effect of unconventional monetary policies on the FDI flow.

This study aims to fill the gap by considering the relation and direction of the Turkey's FDI inflow changes caused by announcements of European central bank

[3] One of the prominent unconventional monetary policies that Federal Open Market Committee (FOMC) turned to is large-scale asset purchases (LSAPs) which referred to as quantitative easing (QE).

unconventional monetary policies as a Turkey's main partner in foreign direct investment in the period between 2002 and 2012.

For these investigations, more than fifty announcements of unconventional monetary policies were considered as well as the financial development parameters and FDI inflows. Event-study methodology was employed to evaluate the relationship between variables.

The present study is designed as follows: Chapter 2 includes theoretical and empirical literatures, Data and methodology of econometric analysis is presented in Chapter 3, Chapter 4 discusses the results of econometric analysis and in Chapter 5 conclusion and some policy suggestions are provided for the economic development of Turkey.

Chapter 2

LITERATURE REVIEW

2.1 Monetary Policy and Financial Development

The relationship between monetary policy and financial development is considerably investigated in the literature. In the case of monetary policy and economic fluctuations, Hiroyuki Yoshida demonstrates that active monetary policy leads to the determinacy of the equilibrium path while passive monetary policy induces economic fluctuations (Hiroyuki, 2007).

In 2010, Reed and Ghossoub (2010) based on neoclassical growth model concluded that the financial system in poor economies is highly malfunctioned and higher rates of money growth leads to lower capital firmness. In the reverse side, Tobin effect is observed in advanced economies. Since inflation worsens the distortions, consequently, the development level affects the efficiency of monetary policy. Afterwards, in 2012 they employ a *neoclassical growth model* in advanced countries to illustrate that the financial system operates more efficiently.

They also in their new article about relationship between stock market and monetary policy in 2013 provide the evidence to show the effects of monetary policy variation across the level of financial development. They believe that increasing the amount of liquidity in economies with small stock markets, causes reduction in capital

accumulation while in advanced economies, capital accumulation improves (Reed & Ghossoub, 2013).

In 1997 Willem Thorbecke examined the effect of monetary policy shocks on stock return. He used federal funds rate and non-borrowed reserves as independent variables to measure monetary policy. According to his finding, in every case ex-post stock returns are increased by expansionary policy increases. Meanwhile, he confirmed his finding by developing the multi factor model (Thorbecke, 1997).

2.2 Monetary Policy, Financial Development and Economic Growth

Recent and expanding literature emphasizes the importance of financial development for economic growth. Considering the work of Schumpeter (1934), economic growth is significantly affected by financial sector development. He also believed that the financial intermediaries as an essential member of financial system are considerably stimulated by development level.

Patrick (1966) evaluated the causality of financial development and economic growth in his study by constructing the supply-leading hypothesis and demand following hypothesis.

While demand following hypothesis was considered in studies of Jung (1986), Gurley et al. (1967) and Goldsmith (1969), supply-leading hypothesis was employed in Levine et al. (2000) Neusser et al. (1998) King et al. (1993) studies.

Tobin (1965) presented a simple model that the rise in consumption in the future might lead to investigate the real capital assets or holding money balances and boost economic growth by expansionary monetary policies. Therefore, Tobin's finding

rebuts the super-neutrality of money. He stated that the increase in money supply might alter the rate of inflation which in turn decline the real rate of return and result in changing of the portfolio structure. Robert Mundell (1963) also explored the relationship between the expected inflation and the real interest rate. He studied the positive effect of stable growth of inflation on demand for the capital, and the real saving and evaluated the long term impacts of inflation on the both economic growth.

In brief, monetary policy might not be expected to be involved in increasing the long term economic growth directly, but to promote the sustainable growth by affecting the price stability.

In 1973, Shaw stated that the economic growth might be affected positively by the financial development. 20 Years after, King et al. (1993) demonstrated the effect of financial development on economic development based on the scale of financial intermediary institutions.

In 1995 Gregorio and Guidotti, evaluated the long-run growth relationship with the financial development. Their findings revealed that in large cross-country sample the relationship is positive, however, the direction of the relationship varies among the countries. Additionally, they proved that the efficiency is an important channel than the volume of investment in transmission process. In addition, economic growth lead to better services and also financial development.

Considering Ross Levine, et al. (2000), differences in cross country accounting system and also legal procedures imply the financial development.

2.3 Monetary Policy, Financial Development and FDI

In order to reach a favorable FDI position in one country the sound financial system is prerequisite. Enhanced financial system illustrate a positive contribution to the transmission of technology which provided by FDI (Hermesa & Lensinka, 2003).

Considering the recent studies of Alfaro et al. (2004), the relationship between the financial system and FDI which evaluated by cross-country data, are resulted in significant contribution of FDI to economic growth.

Five years later, in a similar study, they revealed that financially developed countries benefit more from FDI through the total factor productivity (Alfaro, Kalemli, & Sayek, 2009).

According to the finding of Lee et al. (2009) panel causality tests, there are weak evidences in support of short-run relationship of FDI, financial development and economic growth, meanwhile a long-run relationship between the factors is unequivocal. Overall, in an expanding economical globalization, the findings underscore that countries gain from FDI when they achieve the enhanced financial development.

2.4 Foreign Direct Investment in Turkey

The strategic geographical location of Turkey, the country's especial Customs Union with the European countries and its growing market potential, as well as the stable economy linked Turkey to the world.

The fundamental reforms in 2002 increased the number of investment areas. Main achievements were the enhancing private sector activities in the economy. This increased the effectiveness and elasticity of the financial sectors significantly (Invest in Turkey, 2013).

Turkey planned to attract $123.7bn dollars of FDI during the last decade. Moreover, Turkey increased its FDI market share in Europe by 3.4% despite a 20.82% decline in overall FDI projects in Europe in 2012. These figures make Turkey one of the reliable destinations of FDI in the region.

Approximately, 30% of the 500 top Turkish companies are financed by the international investors in various degrees. Most of the FDI to Turkey emanates from the EU countries with 16,928 established companies in the country (see Figure 1).

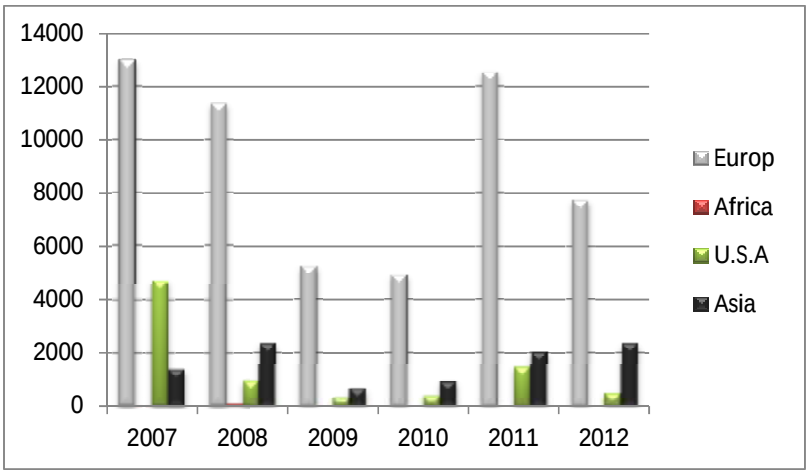

Figure1. FDI in Turkey (By region, Million USD) 2007-2012
Source: Central Bank of the Republic of Turkey

Significant improvements in the short period of time marked Turkey as a phenomenal emerging country; the sixteenth largest economy in the world and the

sixth largest economy in comparison with the Asian countries (The World Bank, 2012).

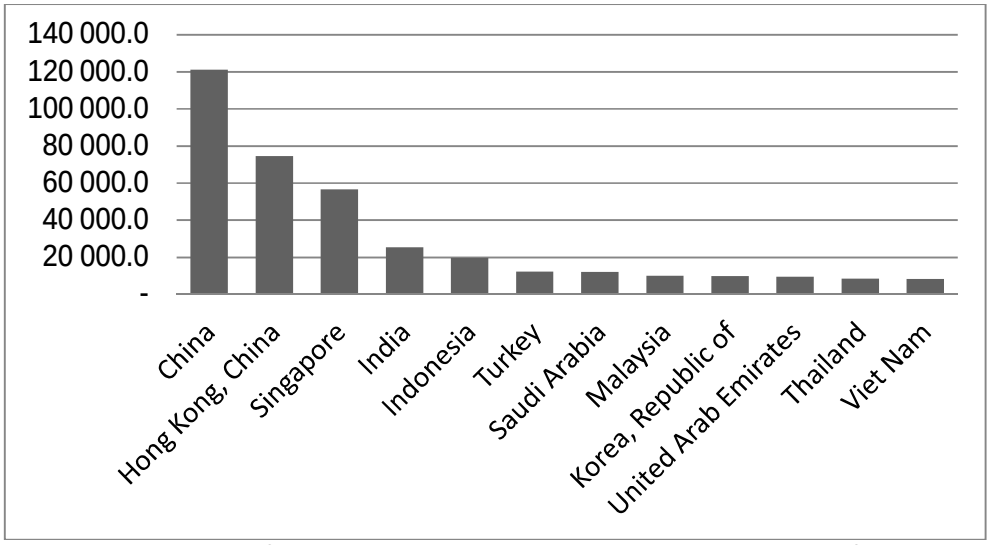

Figure 2. FDI inflow ranking by Asian countries 2012(millions of dollars)
Source: World Bank

In 2012, Turkey was considered as the thirteenth FDI destination, according to the A.T. Kearney FDI Confidence Index[4]. According to the EIM data, between 2007 and 2012, on one hand, US companies were maintaining 28 percent of FDI in Turkey by involving in 86 projects.

On the other hand, the European countries invested in 202 projects in the same span of time which the main area of concentration was located in high technology component. The below figure depicts the FDI inflow to Turkey from 2003 to 2012.

[4] See (http://www.atkearney.com/)

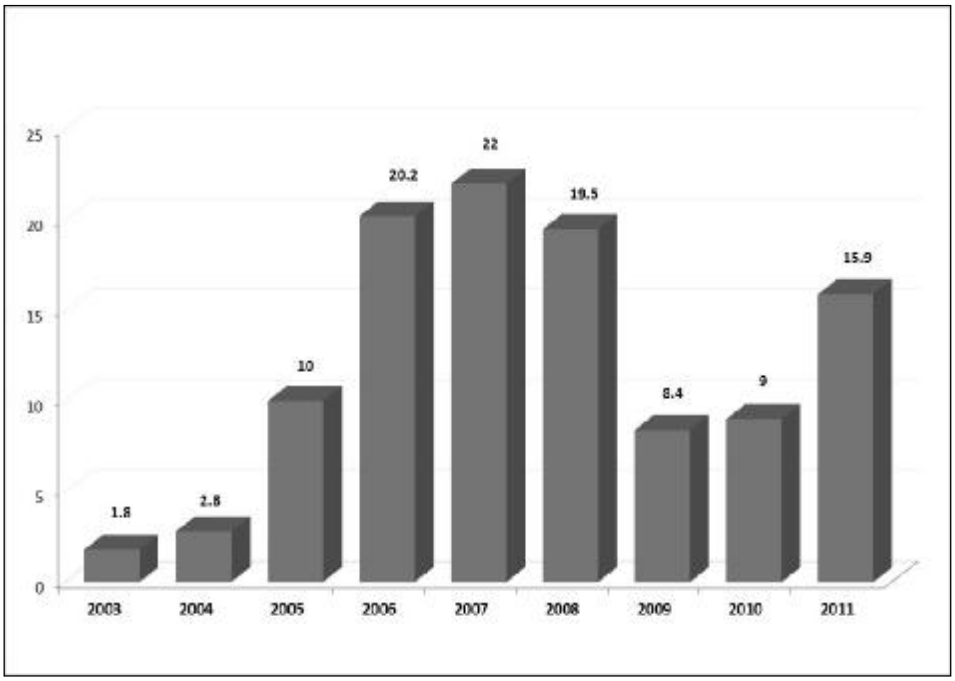

Figure 3. FDI Inflow to Turkey (USD billion)
Source: Central Bank of the Republic of Turkey

The latest statistics revealed that Western Europe play a major role as a foreign direct investor in Turkey; in this regard, Germany, France, UK and Italy are considered as the top four investors in Turkey by 64, 30, 26 and 24 projects respectively (EY, 2013).

Chapter 3

DATA AND METHODOLOGY

3.1 Type and Source of Data

This work adopts two variables, that is, FDI = the quarterly foreign direct investment inflow, which is extracted from TURKSTAT (2012); and FD = the quarterly financial development index which is created from the domestic credit provided by banking sector as percent of GDP (gross domestic product), domestic credit to the private sector as percent of GDP, money and quasi money (M2) as the percent of GDP. The data regarding FD is collected by the BCB from the Focus, a research on the financial market's expectations. The monthly variables at www.bcb.gov.br, the website of World Bank (2012), and International Monetary Fund (IMF, 2012) are collected. In this study data is used in quarterly figures from the first quarter of 2002 (2002Q1) to the fourth quarter of 2012 (2012Q2). In order to capture the growth effect, all the variables are transformed into the natural logarithm form (Katircioglu, 2010).

3.2 Methodology

This sub-section investigates, through the lenses of time-series econometrics, whether and to what extent the ECB communications of unconventional operations are capable to influence the FDI in Turkey. Therefore, regression models proposed in this thesis are based on event study (event analysis) since various dummy variables would be constructed for unconventional monetary events or decisions by European Central Bank. This method of the event study is very similar to Falagiarda

& Reitz (2013). The dummy variables created in this thesis regarding unconventional monetary policy of European Central Bank are summarized in Appendix of this thesis.

Methodologically, this work implements two types of analyses: in advance "Augmented Dickey-Fuller (ADF)", "Phillips-Perron (PP)" and "Kwiatkowski–Phillips–Schmidt–Shin (KPSS)" tests were engaged to test the unit roots of the Financial Development (FD) and Foreign Direct Investment (FDI). The considered series should be tested for "stationary at level; I(0)", or at their "first" or "second" differences, I(1) and I(2). In addition, a possible "co-integration" has to take into account to see "if the series are integrated of the same order", I(d). In the second step, vector autoregressive systems (VAR) tests were used to evaluate the "long-run equilibrium relationship" between FDI and possible variables of financial index.

3.2.1 Empirical Model

More specifically, the present study investigates the effect of Unconventional Monetary Policy (UMP) announcement of European Central Bank (ECB), on the FDI Inflow to Turkey, and suggests that in the case of Turkey, unconventional monetary policies and conventional monetary policy might be included in the foreign direct investment determinants. Hence, following equation can be considered as a functional relationship:

$$FDI = f\,(CMP, UMP) \qquad (1)$$

As mentioned earlier, in order to capture FDI affects, the above relationships described in logarithmic form:

$$FDI_{TR} = b_0 + b_1 (CMP_{EU}) + b_2 (UMP_{EU}) + e_t \quad (2)$$

Where FDI variable is the foreign direct investment inflow to Turkey, UMP and CMP are Unconventional Monetary Policies and Conventional Monetary Policy in European Central Bank, relatively, CMP is defined by Financial Index, which contains Domestic Credit to Government, Domestic Credit to Private Sector and Money Supply in Euro Area and e_t considered as error term. In the long term, b_1 and b_2 introduce the elasticity of CMP and UMP variables, respectively.

3.2.2 Unit Root Tests

The "Augmented Dickey-Fuller" and "Phillips-Perron" test (as an alternative) employed to capture the stationarity of series and the residual values which is robust to autocorrelation (Katircioglu , 2009).

For unit roots test, it is more precise to start from the most general model which includes trend and intercept at the same time (Enders, 1995). That is,

$$\Delta y_t = a_0 + g y_{t-1} + a_2 t + \sum_{i=2}^{p} b_j \Delta y_{t-i-1} + \in_t \quad (3)$$

In this equation, *(y)* corresponding the series, *(t)* is the trend, *(a)* introduce intercept; *(e_t)* equals to Gaussian white noise and *(p)* presents the lag level.

The ADF and PP tests adjust the focus of "t-statistics" and "t-tests" for (λ) and null hypothesis (H_0) assumes "the series are non-stationary". To reject the H_0, coefficient should be significantly different from zero. If the null hypostasis cannot be rejected

at level form, then the first difference is taken into consideration because the non-stationary in (Y_t) can be eliminated by taking the first differences of the time series.

Additionally, unknown data generating process may face research with some problems in rejecting the null hypothesis. In order to defeat the problem, according to (Jenkinson & Sosvilla, 1990), "unit root tests should start from the most general model which includes intercept and trend at the same time". "The linear combination of integrated variables is co-integrated, if the variables are stationary" (Enders, 1995).

To root out the weak characteristics of ADF and PP according to test the stationarity KPPS recommended in order reinforcing the test results (Katircioglu & Naraliyeva, 2006). It is well worth mentioning that the null hypothesis of KPSS test assumed to be "*the series is stationary*". (Kwiatkowski, Phillips, Schmidt, & Shin, 1992).

According to KPSS test assumption series cannot be explored in different steps as follows: a time trend, a random walk and a stationary error, as stated in equation (4):

$$y_t = r\,t + rw_t + e_t \qquad (4)$$

Where $rw_t = rw_{t-1} + v_t$ *and* v_t *is i.i.d* $(0, \delta_v^2)$.

Primarily, the above equation can be considered with a constant regarding level of stationary and also constant and trend to capture the trend stationary. To estimate the LM statistic the residuals e_t of regression used are as follows:

$$LM = T^{-2} \sum_{i=1}^{T} V_t^2 \Big/ V_{e_t}^2 \tag{5}$$

(V_t^2) = VAR (ε_t), $V_t = \sum_{i=1}^{t} e_i$

Considering Kwiatkowski, Phillips, Schmidt, & Shin, (1992), the following statement, according to the behavior of residual value assumptions (V_t^2) is more coherent estimator:

$$V^2(p) = T^{-1} \sum_{t=1}^{T} e_t^2 + 2T^{-1} \sum_{v=1}^{p} w(v,p) \sum_{t=v+1}^{T} e_t e_{t-k}$$

$$w\ (v,p) = 1 - v/\ (v+1) \tag{6}$$

3.2.3 Estimation of Long-Run Model

After the order of integration is verified and series illustrate the integrations of same order, the co-integration between the variables should be estimated to diagnose any long run relationship. In the case that series are stationary at their levels, further steps such as the co-integration and error correction models are not needed. Therefore, equation (2) in this study is estimated with this respect.

Chapter 4

EMPIRICAL RESULTS AND DISCUSSIONS

4.1 Unit Root Test for Stationary

In order to evaluate the level of stationary of foreign direct investment and financial development, unit root tests are implemented in their level form and also their first differences as indicated in Chapter 3. In this regards ADF, PP and KPSS tests are adopted and the results are presented in Table 1 and 2.

Table 1 ADF and PP Approaches for Unit Roots

Statistics (Level)	ln FI	Lag	ln FDI	Lag
τ_T (ADF)	-2.052	(1)	-2.3918	(1)
τ_μ (ADF)	-1.391	(1)	-2.6099	(1)
τ (ADF)	0.921	(1)	-1.0962	(2)
τ_T (PP)	-1.0445	(4)	-1.3159	(4)
τ_μ (PP)	-0.8398	(4)	-1.6894	(5)
τ (PP)	3.0494	(5)	-0.4848	(5)
Statistics (First Difference)	**Δln FI**	**Lag**	**Δln FDI**	**lag**
τ_T (ADF)	-1.830	(0)	-1.9753	(0)
τ_μ (ADF)	-1.697	(0)	-1.7629	(0)
τ (ADF)	-1.280	(0)	-1.7944	(1)
τ_T (PP)	-1.8799	(1)	-2.0880	(2)
τ_μ (PP)	-1.8171	(2)	-1.8780	(2)
τ (PP)	-1.3014	(1)	-1.9044	(2)

Note:FI represents financial index; FDI is Foreign Direct Investment in Turkey; all of the series are at their natural logarithms. τ_T represents the most general model with a drift and trend; τ_μ is the model with a drift and without trend; τ is the most restricted model without a drift and trend. Tests for unit roots have been carried out in E-VIEWS 7.1.

According to Table 1, the null hypothesis which indicates that the stationarity of FDI and FD at their levels cannot be rejected and also their first differences are not proved according to (ADF) and (PP) test. Thus, additional test is required to confirm the result. Since KPSS is eliminating the weaknesses of ADF and PP test, so that KPSS might be proper substitute to evaluate the availability of unit root. Consequently, robust results of KPSS tests in this study are considered.

Table 2 KPSS Test for Unit Root

Statistics (Level)	**lnFDI**	**Lag**	**lnFD**	**lag**
η_t	0.143***	3	0.101	3
η_u	0.292	3	0.466**	3
Statistics (First Difference)	**lnFDI**	**Lag**	**lnFD**	**lag**
η_t	0.099	2	0.099	2
η_u	0.213	3	0.412***	3

Notes: 1. η_t and η_u = constant and trend. 2. *, ** and *** refer to degree of significancy at α= 1%, 5% and 10% respectively 3. E-VIEWS 7.1has been employed to develop unit root test

According to Table 2, both variables (FDI and FD) are found stationary at levels according to KPSS Tests; when the trend variable is omitted in the case of lnFDI, the null hypothesis of no unit root cannot be rejected. It can be rejected when the trend variable is not omitted in the case of lnFD. Therefore, it is concluded that both the lnFD and lnFDI are integrated of order zero, I (0). In other words, foreign direct investment and financial development are stationary at their levels' form.

4.2 Estimation of Long-Run Models

In all of the models, equation (2) is essential for the estimations. In order to minimize the possibility of autocorrelation, which frequently occurs in the models with only few independent variables (Gujarati, 2003), all the models are estimated by using the vector autoregressive systems (VAR). Furthermore, estimations are

done for two separate periods: (1) 2002:Q1 – 2012:Q4 and (2) 2008:Q1 – 2012:Q4. This is for comparison of the results for robustness.

Table 3 gives the results of regressions from the period of 2002:Q1 – 2012:Q4.

Table 3 VAR Estimation Result (2002:Q1 – 2012:Q4)

Variables	2008Q1	2008Q2	2008Q3	2008Q4	2008	2009Q1	2009Q2	2009Q3	2009Q4	2009
$lnFDI_{t-1}$	0.975065	0.974693	0.974338	0.97399	0.98566	0.975644	0.974177	0.972173	0.969015	0.978639
	0.03153	0.0314	0.03127	0.03115	0.03262	0.03065	0.03039	0.03011	0.02974	0.02726
	[30.9206]	[31.0443]	[31.1591]	[31.2642]	[30.2119]	[31.8301]	[32.0551]	[32.2877]	[32.5875]	[35.9050]
$lnFD_{t-1}$	-0.54276	-0.54035	-0.53798	-0.53557	-0.55909	-0.53206	-0.51987	-0.50334	-0.47827	-0.42999
	0.20609	0.20577	0.20554	0.20539	0.20343	0.20271	0.20223	0.2016	0.20025	0.1837
	[-2.63365]	[-2.62601]	[-2.61741]	[-2.60753]	[-2.74833]	[-2.62476]	[-2.57074]	[-2.49667]	[-2.38836]	[-2.34074]
Intercept	2.713782	2.702086	2.690575	2.678911	2.79517	2.662538	2.603558	2.52365	2.402616	2.173399
	1.00784	1.00628	1.00515	1.00443	0.99496	0.99128	0.98885	0.98567	0.97886	0.89772
	[2.69268]	[2.68522]	[2.67679]	[2.66710]	[2.80933]	[2.68596]	[2.63293]	[2.56034]	[2.45450]	[2.42101]
UMP	-0.06074	-0.0604	-0.06061	-0.06146	-0.07388	-0.12632	-0.13952	-0.16098	-0.19591	-0.17573
	0.54276	0.54035	0.537977	0.535569	0.06262	0.532064	0.519874	0.503337	0.478267	0.05359
	[-0.52362]	[-0.52279]	[-0.52656]	[-0.53560]	[-1.17987]	[-1.11785]	[-1.24242]	[-1.44244]	[-1.77070]	[-3.27882]
R^2	0.969907	0.969907	0.96991	0.969918	0.970807	0.970695	0.970925	0.971335	0.972107	0.976651
Adj. R^2	0.9674	0.967399	0.967402	0.967411	0.968374	0.968253	0.968502	0.968946	0.969783	0.974705
S.E.	0.112031	0.112033	0.112026	0.112012	0.110344	0.110555	0.110121	0.109342	0.107858	0.098683
F-statistic	386.7682	386.7587	386.8022	386.9077	399.0577	397.4911	400.7233	406.627	418.2218	501.9379

Table 3 VAR Estimation Result (2002:Q1 – 2012:Q4) (continued)

Variables	2010Q1	2010Q2	2010Q3	2010Q4	2010
$lnFDI_{t-1}$	0.971362	0.971366	0.971372	0.971378	0.970162
	0.0312	0.03125	0.03132	0.03139	0.03266
	[31.1360]	[31.0801]	[31.0169]	[30.9457]	[29.7070]
$lnFD_{t-1}$	-0.530757	-0.530936	-0.531113	-0.531274	-0.517652
	0.21102	0.2117	0.21244	0.21323	0.23621
	[-2.51514]	[-2.50792]	[-2.50009]	[-2.49156]	[-2.19145]
Intercept	2.655101	2.655956	2.656802	2.657574	2.59193
	1.03125	1.0345	1.03801	1.0418	1.15119
	[2.57465]	[2.56738]	[2.55951]	[2.55095]	[2.25153]
UMP	-0.008455	-0.007505	-0.006668	-0.005954	-0.009666
	0.1166	0.11701	0.531113	0.531274	0.06813
	[-0.07251]	[-0.06414]	[-0.05677]	[-0.05048]	[-0.14187]
R-squared	0.969683	0.969682	0.969681	0.96968	0.969695
Adj. R-	0.967156	0.967155	0.967154	0.967154	0.96717
S.E.	0.112449	0.112451	0.112452	0.112453	0.112426
F-statistic	383.8119	383.7994	383.7896	383.7821	383.9754

Table 3 VAR Estimation Result (2002:Q1 – 2012:Q4) (continued)

Variables	2011Q1	2011Q2	2011Q3	2011Q4	2011	2012Q1	2012Q2	2012Q3	2012Q4	2012
$lnFDI_{t-1}$	0.981496	0.978014	0.975557	0.973729	0.999808	0.971524	0.971361	0.971124	0.970794	0.969665
	0.0301	0.03016	0.0302	0.03026	0.02605	0.03095	0.03096	0.03097	0.03099	0.03094
	[32.6079]	[32.4322]	[32.2990]	[32.1810]	[38.3735]	[31.3883]	[31.3791]	[31.3603]	[31.3304]	[31.3409]
$lnFD_{t-1}$	-0.634982	-0.614309	-0.599317	-0.587883	-0.927709	-0.526439	-0.524187	-0.521502	-0.518272	-0.47795
	0.20475	0.20517	0.20525	0.20517	0.19142	0.2093	0.20952	0.20976	0.20999	0.22267
	[-3.10119]	[-2.99417]	[-2.92000]	[-2.86531]	[-4.84652]	[-2.51523]	[-2.50180]	[-2.48623]	[-2.46802]	[-2.14645]
Intercept	3.157858	3.05834	2.986139	2.931053	4.571322	2.634173	2.623313	2.610371	2.594817	2.40001
	1.00031	1.00255	1.0031	1.00288	0.93331	1.02316	1.0242	1.02528	1.02638	1.08686
	[3.15687]	[3.05055]	[2.97691]	[2.92265]	[4.89798]	[2.57454]	[2.56132]	[2.54600]	[2.52811]	[2.20820]
UMP	0.207596	0.183415	0.165771	0.152305	0.235506	-0.023966	-0.02978	-0.036294	-0.043667	-0.041476
	0.634982	0.614309	0.599317	0.587883	0.05503	0.526439	0.524187	0.521502	0.518272	0.06429
	[1.83223]	[1.61812]	[1.46213]	[1.34275]	[4.27965]	[-0.20682]	[-0.25695]	[-0.31303]	[-0.37639]	[-0.64513]
R-squared	0.972265	0.971734	0.971378	0.971124	0.979903	0.969714	0.969734	0.96976	0.969797	0.970025
Adj. R-squared	0.969953	0.969378	0.968993	0.968718	0.978228	0.96719	0.967211	0.96724	0.96728	0.967527
S.E. equation	0.107554	0.108578	0.10926	0.109743	0.091554	0.11239	0.112354	0.112304	0.112236	0.111813
F-statistic	420.6589	412.5375	407.2555	403.5746	585.0982	384.2244	384.4799	384.8313	385.3115	388.3294

Considering Table 3, between the first quarter of 2002 and the fourth quarter of 2012, financial development index (FD) in Euro area presents negative and statistically significant impact on the FDI inflow to Turkey. For instance, in 2009 and 2011, one percent change in financial development in EU will alter Turkey FDI inflow by approximately 0.43% and 0.93% respectively in the negative direction.

In particular, in the case of 2008:Q1, It is seen that financial development index exerts negative and statistically significant effect on FDI to Turkey, which suggests that one percent change in the financial sector of EU might lead to 0.54 percent change in FDI to Turkey in the opposite direction. On the other hand, the unconventional monetary policy variable does not exert statistically significant effect on FDI to Turkey in mentioned period. This suggests that, unconventional monetary decisions by European Central Bank during the first quarter of 2008 do not have any significant effects on the FDI movements to Turkey.

According to unconventional monetary policy by inspecting the T-test result in 2009:Q4, unconventional monetary policy in EU is statistically significant at 90% interval and leads to 0.19% decline in FDI to Turkey. On the other hand, in 2011:Q1, UMP of EU shows the significant effect on Turkey's FDI at a=10% and by 0.2% in the positive direction.

In 2009 and 2011 (on the yearly base), the unconventional monetary, as an independent variable, illustrate statistically significance results in 99% interval. On the other word, in 2009 and 2011, existence of unconventional monetary policy of ECB, resulted in 0.17% decrease and 0.23% increase of foreign direct investment to Turkey, respectively.

The sample period from 2008 to 2012 covers the global financial crisis giving rise to the possibility of various reactions of ECB announcements. Table 4 reports parameters estimated by vector autoregressive systems from the period of 2008 first quarter to 2012 fourth quarter presented to evaluate the effect of UMP and FD of EU on the FDI to Turkey during the crisis in Europe.

Table 4 VAR Estimation Result (2008:Q1 – 2012:Q4)

Variables	2008Q1	2008Q2	2008Q3	2008Q4	2008	2009Q1	2009Q2	2009Q3	2009Q4	2009
$lnFDI_{t-1}$	1.018712	1.016897	1.016506	1.016929	1.011958	1.017311	1.016167	1.005073	0.967078	0.963417
	0.17164	0.17304	0.17411	0.17489	0.14539	0.17473	0.17196	0.16673	0.15732	0.13909
	[5.93503]	[5.87659]	[5.83820]	[5.81475]	[6.96038]	[5.82226]	[5.90922]	[6.02803]	[6.14722]	[6.92638]
$lnFD_{t-1}$	1.468288	1.387981	1.33164	1.292353	2.990967	1.161677	1.140832	1.084916	0.878413	0.459988
	1.38847	1.39086	1.39372	1.39659	1.32307	1.39373	1.36736	1.32431	1.24403	1.12127
	[1.05749]	[0.99793]	[0.95546]	[0.92536]	[2.26063]	[0.83350]	[0.83433]	[0.81923]	[0.70610]	[0.41024]
Intercept	-7.40729	-7.003	-6.71974	-6.52248	-15.0659	-5.86417	-5.75712	-5.46765	-4.40574	-2.28975
	7.05593	7.06894	7.0841	7.09915	6.70917	7.0849	6.9514	6.73287	6.32554	5.70071
	[-1.04980]	[-0.99067]	[-0.94857]	[-0.91877]	[-2.24557]	[-0.82770]	[-0.82820]	[-0.81208]	[-0.69650]	[-0.40166]
UMP	0.094236	0.074774	0.05712	0.040705	0.215988	-0.04358	-0.08202	-0.12596	-0.18466	-0.13809
	0.10711	0.10539	0.10388	0.10256	0.07949	0.101	0.0972	0.09312	0.08764	0.04381
	[0.87979]	[0.70950]	[0.54985]	[0.39690]	[2.71709]	[-0.43148]	[-0.84390]	[-1.35259]	[-2.10691]	[-3.15216]
R^2	0.917229	0.915872	0.914834	0.914071	0.940622	0.914223	0.916923	0.922129	0.932071	0.946468
Adj. R^2	0.90171	0.900098	0.898866	0.897959	0.929489	0.89814	0.901346	0.907528	0.919334	0.936431
S.E.	0.093181	0.093942	0.094519	0.094942	0.078922	0.094858	0.093353	0.090381	0.084414	0.074936
F-statistic	59.10152	58.06186	57.28956	56.7333	84.48712	56.84335	58.86383	63.1559	73.18019	94.29615

Table 4 VAR Estimation Result (2008:Q1 – 2012:Q4) (continued)

Variables	2010Q1	2010Q2	2010Q3	2010Q4	2010
$lnFDI_{t-1}$	1.009368	1.00519	1.001241	0.997362	0.883086
	0.18553	0.18452	0.18364	0.18286	0.24122
	[5.44051]	[5.44754]	[5.45226]	[5.45433]	[3.66094]
$lnFD_{t-1}$	1.176082	1.154362	1.137168	1.123497	0.459148
	1.44186	1.4315	1.42228	1.41394	1.67242
	[0.81567]	[0.80640]	[0.79954]	[0.79459]	[0.27454]
Intercept	-5.93256	-5.82065	-5.73154	-5.66011	-2.24799
	7.33438	7.28158	7.23462	7.19206	8.53285
	[-0.80887]	[-0.79937]	[-0.79224]	[-0.78699]	[-0.26345]
UMP	-0.01413	-0.02239	-0.03077	-0.03939	-0.06215
	0.10401	0.10386	0.10387	0.10405	0.07804
	[-0.13582]	[-0.21556]	[-0.29625]	[-0.37854]	[-0.79640]
R-squared	0.913325	0.913476	0.913698	0.913995	0.916534
Adj. R-squared	0.897073	0.897253	0.897517	0.897869	0.900884
S.E. equation	0.095353	0.09527	0.095148	0.094984	0.093572
F-statistic	56.19904	56.30668	56.46532	56.67861	58.56457

Table 4 VAR Estimation Result (2008:Q1 – 2012:Q4) (continued)

Variables	2011Q1	2011Q2	2011Q3	2011Q4	2011	2012Q1	2012Q2	2012Q3	2012Q4	2012
$lnFDI_{t-1}$	1.109426	1.027143	0.977941	0.937022	0.950871	1.082548	1.064202	1.048342	1.032887	1.369033
	0.16479	0.16365	0.16817	0.17717	0.09533	0.19826	0.18681	0.17908	0.17442	0.213
	[6.73254]	[6.27632]	[5.81504]	[5.28871]	[9.97493]	[5.46021]	[5.69660]	[5.85412]	[5.92198]	[6.42735]
$lnFD_{t-1}$	1.663126	1.127139	0.798278	0.515496	-0.14414	1.762428	1.624477	1.507119	1.394867	4.307333
	1.27204	1.29837	1.34967	1.42444	0.78254	1.58657	1.49705	1.4342	1.39268	1.77889
	[1.30745]	[0.86812]	[0.59146]	[0.36189]	[-0.18420]	[1.11084]	[1.08512]	[1.05084]	[1.00157]	[2.42136]
Intercept	-8.44699	-5.70721	-4.02755	-2.58468	0.675723	-8.91358	-8.21101	-7.61304	-7.04077	-21.8167
	6.47019	6.60012	6.85941	7.23939	3.97383	8.06446	7.6089	7.2894	7.07873	9.03211
	[-1.30552]	[-0.86471]	[-0.58716]	[-0.35703]	[0.17004]	[-1.10529]	[-1.07913]	[-1.04440]	[-0.99464]	[-2.41546]
UMP	0.184417	0.146792	0.134078	0.133942	0.201072	-0.07538	-0.07049	-0.06864	-0.0695	-0.16
	0.09442	0.09327	0.0954	0.10009	0.03217	0.11159	0.10516	0.10081	0.09819	0.06812
	[1.95322]	[1.57377]	[1.40544]	[1.33827]	[6.25050]	[-0.67545]	[-0.67028]	[-0.68092]	[-0.70778]	[-2.34873]
R-squared	0.929932	0.924857	0.92276	0.92196	0.974788	0.915631	0.915595	0.915669	0.915859	0.935473
Adj. R-squared	0.916794	0.910767	0.908278	0.907328	0.970061	0.899811	0.899769	0.899856	0.900083	0.923374
S.E. equation	0.085733	0.088784	0.090013	0.090479	0.051427	0.094076	0.094096	0.094055	0.093949	0.082273
F-statistic	70.7832	65.64222	63.71589	63.00793	206.2047	57.88074	57.85399	57.90921	58.05254	77.31901

In accordance with Table 4, with the transition to the second sample period, financial development index only in 2008 and 2012 at the five percent level, remain significant in the positive direction. From the other point of view, in 2008 and 2012, one percent change in financial development of EU conducts to 2.99 and 4.30 percent change in Turkey's FDI in the same direction. Additionally, the estimated coefficient of the equations, are not statistically significant for FD in remaining time span according to the T-test result.

Based on Table 3, in 2008, 2009, 2011 and 2012 as a whole year and specifically in 2009:Q4 and 2011:Q1 the unconventional monetary policy of ECB involvement in changing foreign direct investment to Turkey, provides significant results. For instance, one percent raise in the European UMP increased the Turkish FDI by 184 basis points in the first quarter of 2011.

The estimation of the unconventional monetary policy measure was positive and significant in high degree in 2011 which indicated that the non-standard monetary policy operations associated with ECB resulted in ascend in the Turkey FDI. Specifically, unconventional monetary policies announcement of European Central Bank lead to 20 basis points increase in Turkey's FDI. Furthermore, in 2011 EU unconventional monetary policy influenced Turkey's FDI by, 0.216 percent, in a positive direction.

Consistently with the findings of the VAR estimation UMP was negatively correlated with the FDI in 2009:Q4, 2009 and 2012, for instance, UMP in 2009:Q4 affected the foreign direct investment approximately on average by 184 bp in the reversed direction.

To robust the significancy level of results, more specific sample which includes 2008:Q1-2012:Q4 period are taken into consideration. From the inspection of the full-sample (2002:Q1-2012:Q4) estimation, it is found that the European central bank operations especially illustrate the negative impact in 2009 and 2009:Q4 while it presented significant reversal on 2011 and 2011:Q1 by showing a positive effect on Turkey's FDI.

When looking at the second sample (2008:Q1-2012:Q4) the following results are required to taken into consideration. In comparison to the first sample, a number of significant coefficients according to unconventional monetary policy increased to six while the financial development decreased to only two significant coefficients. According to that, by restricting time span, the effect of financial development index on FDI to Turkey is dominated by unconventional monetary policy in EU although this finding is somewhat in contrast to full-sample.

To sum up the tables, within the event analysis, the effect of ECB non-standard decision on the Turkey foreign direct investment inflow seems to differ over time and across the sample size. However in 2008 negative and in 2009 positive effect of unconventional monetary policy on Turkey's FDI inflow is jointly approved in the both samples.

4.3 Estimation of lag effects

Since FDI is a long-term decision, to evaluate the lag effect of nonstandard monetary policies, trend dummies are considered in addition to single dummy. Whereas in the first and second VAR estimation samples of this study, the coefficients in 2009 and 2011 illustrate significant effect, trend dummies are

employed for their 6 previous lags to determine if there are any decisions in their ex-quarters led to stimulating the FDI inflow in coming quarters.

According to Table 5 and 6, monetary policies in 2008 and 2010 significantly affected FDI inflow to Turkey in 2009 and 2011 respectively.

Considering trend analysis in 2008, the co-efficient of estimated 6 lags are significant and lag 2,3,4,5 and 6 illustrate negative direction of unconventional monetary policy on Turkey FDI inflow while in 2010 the forth lag is positively significant. These results are in line with dummy analysis. On the other words, in 2008 negative and in 2010 positive impacts of non-standard monetary policy on FDI inflow to Turkey are approved by trend analysis of VAR estimation. This means that, FDI inflow has been changed by related policies in their previous quarters. For instance unconventional monetary policies in 2010 had positive influence on FDI inflow by 4 quarters lag.

Table 5 VAR Estimation Results of Trend Dummies (2008)

	LNFDI		LNFDI
LNFDI(-1)	11.55088	TREND2(-5)	-1.044213
	(2.63634)		(0.22387)
	[4.38141]		[-4.66443]
LNFDI(-2)	-0.216085	TREND2(-6)	-0.101879
	(0.38963)		(0.03613)
	[-0.55460]		[-2.81998]
LNFDI(-3)	-1.931022	LNFD(-1)	318.3641
	(0.64545)		(74.4194)
	[-2.99174]		[4.27797]
LNFDI(-4)	-3.073089	LNFD(-2)	-109.3055
	(0.79850)		(24.0353)
	[-3.84860]		[-4.54770]
LNFDI(-5)	-14.1523	LNFD(-3)	-55.53824
	(2.64217)		(18.8622)
	[-5.35631]		[-2.94441]
LNFDI(-6)	16.72384	LNFD(-4)	-60.33333
	(3.36519)		(16.1838)
	[4.96965]		[-3.72802]
TREND2(-1)	0.628016	LNFD(-5)	-354.8434
	(0.13291)		(69.5312)
	[4.72505]		[-5.10337]
TREND2(-2)	-0.163368	LNFD(-6)	339.8370
	(0.03439)		(67.4196)
	[-4.75006]		[5.04062]
TREND2(-3)	-0.26548	C	-396.4675
	(0.06613)		(106.877)
	[-4.01474]		[-3.70958]
TREND2(-4)	-0.398713		
	(0.08682)		
	[-4.59242]		
R-squared	0.999760		
Adj. R-squared	0.995446		
S.E. equation	0.020057		
F-statistic	231.7339		

Table 6 VAR Estimation Results of Trend Dummies (2010)

	LNFDI		LNFDI
LNFDI(-1)	-0.17489	TREND4(-4)	0.051903
	(0.66396)		(0.01197)
	[-0.26341]		[4.33597]
LNFDI(-2)	-0.161017	TREND4(-5)	-0.004666
	(0.42013)		(0.01377)
	[-0.38325]		[-0.33882]
LNFDI(-3)	-0.013972	LNFD(-1)	-10.92099
	(0.37338)		(6.96611)
	[-0.03742]		[-1.56773]
LNFDI(-4)	1.330040	LNFD(-2)	-4.05723
	(0.46003)		(6.66608)
	[2.89122]		[-0.60864]
LNFDI(-5)	-1.672581	LNFD(-3)	-2.398911
	(0.29491)		(6.44736)
	[-5.67148]		[-0.37208]
TREND4(-1)	-0.019396	LNFD(-4)	19.11470
	(0.02413)		(7.31306)
	[-0.80390]		[2.61378]
TREND4(-2)	-0.00934	LNFD(-5)	-13.59987
	(0.01643)		(5.52923)
	[-0.56844]		[-2.45963]
TREND4(-3)	0.000306	C	60.50271
	(0.01243)		(30.7172)
	[0.02463]		[1.96967]
R-squared	0.998506		
Adj. R-squared	0.992904		
S.E. equation	0.025036		
F-statistic	178.2479		

Chapter 5

CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

As the perceived financial crisis started to aggravation following the Lehmann bankruptcy in 2008, the differential between the foreign direct investment to Turkey in previous years and coming years widened negatively to its unprecedented extent. Simultaneously, the ECB started a number of unconventional programs which design to reestablish the appropriate functioning of financial system of EU. These decisions influenced the Euro area investment partners as well. This study considers the effect of European central bank unconventional operations on Turkey foreign direct investment during crisis period by employing event study analysis. The results illustrate non-standard policies of ECB have influenced Turkey FDI in some extent.

At the onset of the banking crisis, the impact of policy interventions on a monetary base was sterilized to take overnight rates adjusted to policy targets. But after 2008, the central bank of European Union attended in several refinancing operations such as fixed rate tenders and full allotment (FRTFA) additionally with two large long term refinance operations (LTROs). Those procedures impulse Turkey's FDI negatively and lead to decline in FDI inflow to Turkey due to concerning about their actual effect on the financial sector and investment parameters.

Moreover, events taking place in 2010 were more effective in improving the FDI to Turkey in year 2011. In 2010, the EU commenced the European financial stability facility which is designed to improve the stability of financial market. In order to advocate proper functioning of the transmission channels, European central bank implemented numbers of operations such as securities markets programme, purchasing euro area private and public securities, and also extend the list of the collateral asset. This relative firmness in the market leads to increase in FDI proportion to Turkey as it is also found in this study for 2011.

In general, during the financial crisis, undesired effects of decisions are inventible. Operations such as expanding policies could affect the expectations of the agents in unfavorable directions such as deteriorating the perspective of macroeconomic variables and also decrease the future certainty and stability of financial market. These uncertainties might affect risk premium required by investors and effect their involvement in foreign direct investment. On the other hand, decisions which affect the stability of financial environment, especially long term interest rates as an important factor of FDI, would pave the way to sovereign strategies.

5.2 Policy Implications

FDI plays a vital role in terms of financial development and economic growth of countries. During the financial crisis, governments tend to design special incentives to absorb higher share of FDI inflow. In this regard, tax exemption or incentive policies such as the monopoly rights are adopted. Hence, a high content of technology and research and development activities accompany with high levels of technology to reach world market share will be important. Due to the contribution of unconventional monetary policy of EU on FDI to Turkey, the Turkish government

could launch a number of incentive programs to overcome the crisis' negative impacts. Linking of these incentives to especially non-standard monetary policies which affect the long term interest rate and also the stability of the financial system will be beneficial for Turkey to increase its share of FDI inflow.

5.3 Shortcoming of the Study and Directions for Further Researches

The availability and accessibility of data in the quarterly period in "unconventional monetary policy" and "financial development index" and also the lack of similar articles considering other countries to make a comparison were the shortcomings of this study. Further research is be needed to evaluate the effect of unconventional monetary policy of different central banks, such as the Federal Reserve or Bank of England, on foreign direct investment of their investment destinations.

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APPENDIX

APPENDIX: ECB Unconventional Monetary Policy Programs Announcements

Date	Event	Type	Description
10/1/2008	PR	FOR	The GC decided to conduct US dollar liquidity-providing operation
7/2/2008	PC	LTRO	The GC decided to renew two outstanding supplementary longer-term re financing operations
11/3/2008	PR	FOR	The GC decided to conduct US dollar liquidity-providing operations
28/03/2008	PR	LTRO	The GC decided to conduct supplementary longer-term re - nancing operations
2/5/2008	PR	FOR	The GC decided to enhance US dollar liquidity-providing operations
30/07/2008	PR	FOR	The GC decided to enhance US dollar liquidity-providing operations
31/07/2008	PR	LTRO	The GC decided to renew two outstanding supplementary longer-term re nancing operations
4/9/2008	PC	LTRO	The GC decided to renew three outstanding supplementary longer-term re nancing operations
18/09/2008	PR	FOR	The GC decided to enhance US dollar liquidity-providing operations
26/09/2008	PR	FOR	The GC decided to enhance US dollar liquidity-providing operations
29/09/2008	PR	FOR	The GC decided to double the temporary swap lines with the Fed
7/10/2008	PR	LTRO, FOR	The GC decided to enhance a longer-term re nancing operation and expand US dollar liquidity-providing operations
8/10/2008	PR	FRTFA	The GC decided to adopt a xed rate tender procedure with full allotment
13/10/2008	PR	FOR	The GC decided to conduct US dollar liquidity-providing operations
15/10/2008	PR	COLL, LTRO, FOR	The GC decided to expand the list of assets eligible as collateral, enhance the provision of longer-term re nancing operations, and provide US dollar liquidity through foreign exchange swaps
18/12/2008	PR	FRTFA	The GC decided that the main re nancing operations will continue to be carried out through a xed rate tender procedure with full allotment for as long as needed
19/12/2008	PR	FOR	The GC decided to continue conducting US dollar liquidity-providing operations
3/2/2009	PR	FOR	The GC decided to extend the liquidity swap arrangements with the Fed
5/3/2009	PC	FRTFA, LTRO	The GC decided to continue the xed rate tender procedure with full allotment for all main re nancing operations, special-term re nancing operations and supplementary and regular longer-term re nancing operations for as long as needed
19/03/2009	PR	FOR	The GC decided to continue conducting US dollar liquidity-providing operations
6/4/2009	PR	FOR	The GC decided to establish a temporary reciprocal currency arrangement (swap line) with the Fed

ECB unconventional monetary policy programs announcements (continued)

Date	Event	Type	Description
7/5/2009	PC, PR	LTRO, CBPP	The GC decided to proceed with the ECS. In particular, the GC decided to purchase euro-denominated covered bonds issued in the euro area, and to conduct liquidity-providing longer-term re nancing operations with a maturity of one year
4/6/2009	PC	CBPP	The GC decided upon the technical modalities of the CBPP1
25/06/2009	PR	FOR	The GC decided to extend the liquidity swap arrangements with the Fed
24/09/2009	PR	FOR	The GC decided to continue conducting US dollar liquidity-providing operations
3/12/2009	PC	FRTFA, LTRO	The GC decided to continue conducting its main re nancing operations as xed rate tender procedures with full allotment for as long as is needed, and to enhance the provision of longer-term re nancing operations
4/3/2010	PC	FRTFA, LTRO	The GC decided to continue conducting its main re nancing operations as xed rate tender procedures with full allotment for as long as is needed, and to return to variable rate tender procedures in the regular 3-month longer-term re nancing operations
10/5/2010	PR	SMP, FOR, LTRO	The GC decided to proceed with the SMP, to reactivate the temporary liquidity swap lines with the Fed, to adopt a xed-rate tender procedure with full allotment in the regular 3-month longer-term re nancing operations, and to conduct new special longer-term re nancing operations
10/6/2010	PC	LTRO	The GC decided to adopt a xed rate tender procedure with full allotment in the regular 3-month longer-term re nancing operations
2/9/2010	PC	FRTFA, LTRO	The GC decided to continue to conduct its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment
2/12/2010	PC	FRTFA, LTRO	The GC decided to continue to conduct its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment
17/12/2010	PR	FOR	The ECB announced a temporary swap facility with the Bank of England
21/12/2010	PR	FOR	The GC decided to extend the liquidity swap arrangements with the Fed
3/3/2011	PC	FRTFA, LTRO	The GC decided to continue to conduct its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment

ECB unconventional monetary policy programs announcements (continued)

Date	Event	Type	Description
9/6/2011	PC	FRTFA, LTRO	The GC decided to continue to conduct its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment
29/06/2011	PR	FOR	The GC decided to extend the liquidity swap arrangements with the Fed
4/8/2011	PC	FRTFA, LTRO	The GC decided to continue conducting its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, to conduct 3-month longer-term re-nancing operations as xed rate tender procedures with full allotment, and to conduct a liquidity-providing supplementary longer-term re nancing operation with a maturity of six months as a xed rate tender procedure with full allotment
8/8/2011	PR	SMP	The GC decided to actively implement its Securities Markets Programme for Italy and Spain
25/08/2011	PR	FOR	The GC decided to extend the liquidity swap arrangement with the Bank of England
15/09/2011	PR	FOR	The GC decided to conduct three US dollar liquidity-providing operations in coordination with other central banks
6/10/2011	PC	FRTFA, LTRO, CBPP	The GC decided to continue conducting its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, to conduct 3-month longer-term re-nancing operations as xed rate tender procedures with full allotment, to conduct two liquidity-providing supplementary longer-term re nancing operation with a maturity of twelve and thirteen months as a xed rate tender procedure with full allotment, and to launch a new covered bond purchase program (CBPP2)
3/11/2011	PR	CBPP	The GC decided upon the technical modalities of CBPP2
30/11/2011	PR	FOR	The GC decided in cooperation with other central banks the establishment of a temporary network of reciprocal swap lines
8/12/2011	PC	LTRO, COLL	The GC decided to conduct two longer-term re nancing operations with a maturity of three years and to increase collateral availability
9/2/2012	PC	COLL	The GC approved speci c national eligibility criteria and risk control measures for the temporary acceptance in a number of countries of additional credit claims as collateral in Eurosystem credit operations.

ECB unconventional monetary policy programs announcements (continued)

Date	Event	Type	Description
6/6/2012	PC	FRTFA, LTRO	The GC decided to continue to conduct its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment
22/06/2012	PR	COLL	The GC took further measures to increase collateral availability for counterparties
26/07/2012	SP	OMT	Draghi's London speech (\. . . the ECB is ready to do whatever it takes to preserve the euro.")
2/8/2012	PC	OMT	The GC announced that may undertake outright open market operations of a size adequate to reach its objective. Markets disappointed for lack of details about OMT
27/08/2012	SP	OMT	Asmussen's Hamburg speech supporting the new bond purchase program
6/9/2012	PC	OMT, COLL	The GC announced the technical details of OMT and decided on additional measures to preserve collateral availability
12/9/2012	PR	FOR	The GC decided to extend the liquidity swap arrangement with the Bank of England
6/12/2012	PC	FRTFA, LTRO	The GC decided to continue conducting its main re nancing operations as xed rate tender procedures with full allotment for as long as necessary, and to conduct 3-month longer-term re nancing operations as xed rate tender procedures with full allotment
13/12/2012	PR	FOR	The GC decided to extend the liquidity swap arrangements with the Fed

Notes: PC indicates Press Conference; PR indicates Press Release; SP indicates Speech. (Falagiarda & Reitz, 2013)