INFLATION TARGETING AND FISCAL DOMINANCE: EVIDENCE FROM TURKEY

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ABSTRACT

INFLATION TARGETING AND FISCAL DOMINANCE:
EVIDENCE FROM TURKEY

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This study investigates the significance of fiscal dominance for an inflation targeting regime in the context of the recent Turkish experience. To this end, capital flows and country risk equations are estimated for the Turkish monthly data pertaining the inflation targeting regime implementation period. The results from the capital flows models based on portfolio approach strongly suggest that the real effective exchange rates in Turkey during the period are determined by foreign interest rates and the Emerging Markets Bond Index (EMBI) but not by the domestic interest rates in the long run. This supports the view that the risk premium channel dominates the standard portfolio channel in the determination of real exchange rates in Turkey during the period. The country risk of Turkey, proxied by the EMBI spread in the long run is determined by risk appetite of foreign investors and domestic variables including real debt stock, real consolidated budget balance, international gross reserves, current account deficits and credit ratings. All these results are found to be important manifestations of the presence fiscal dominance in Turkey. Consequently, contrary to the postulations of the conventional monetary policy transmission mechanism, interest rate increases to cope with inflationary pressures may lead to an inflation acceleration, rather than the reverse.

Keywords: fiscal dominance, country risk premium, risk aversion, inflation targeting, Turkey.

ÖZ

ENFLASYON HEDEFLEMESİ VE MALİ BASKINLIK:
TÜRKİYE ÖRNEĞİ

SEL, TUĞBA
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Bu çalışma, Türkiye deneyimi çerçevesinde mali baskınlığın enflasyon hedeflemesi rejimi için önemini araştırmaktadır. Bu amaçla, Türkiye enflasyon hedeflemesi uygulama sürecini kapsayan aylık veriler için sermaye hareketleri ve ülke riski denklemleri tahmin edilmiştir. Portföy yaklaşımına dayanan sermaye hareketleri modeli sonuçları, bu süre içerisinde reel efektif döviz kurlarının, uzun dönemde yurt dışı faiz oranları ve Emerging Markets Bond Index (EMBI) tarafından belirlendiğini fakat yurt içi faiz oranlarının bir etkisi olmadığını göstermiştir. Bu sonuçlar, Türkiye'de bu süre içersinde reel döviz kuru belirlenmesinde, risk primi kanalının standart portföy kanalına göre baskın çıktığı fikrini desteklemektedir. EMBI farkı ile tahmin edilen Türkiye ülke riskinin uzun dönemde yabancı yatırımcı risk iştahı ve reel borç stoğu, reel konsolide bütçe dengesi, uluslararası brüt reservler, cari açık ve kredi derecelendirme gibi yurtiçi değişkenler tarafından belirlendiği görülmüştür. Bütün bu sonuçlar, Türkiye'de mali baskınlığın var olduğunu gösteren önemli gerekçelerdir. Sonuç olarak, geleneksel para politikası aktarım mekanizmasının tersine, enflasyon baskısını engellemek için artırılan faiz oranları enflasyonun azalması yerine, artmasına neden olabilmektedir.

Anahtar Kelimeler: mali baskınlık, ülke risk primi, riskten kaçınma, enflasyon hedeflemesi, Türkiye.

To My Mother and Father

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER I

INTRODUCTION

Inflation targeting (IT) as a monetary policy regime is being used by an increasing number countries. Due to the poor performance of other nominal anchors like exchange rates or monetary aggregates, increasing number of industrialized countries has started to implement an inflation targeting framework in order to meet the main objective of central banks, price stability. The currency and financial crises of some Latin American and East Asian countries with pegged exchange rate regimes in the 1990s and the early 2000s have led them to consider a new nominal anchor, the success of which has been already proven by a number of industrialized countries. Thus, IT has become an increasingly attractive alternative regime which has been started to be adopted not only by industrialized countries but also by a growing number of emerging market countries including Chile, Brazil, the Czech Republic, Poland, South Africa and Turkey.

IT is a powerful policy towards price stability inflation with its transparency, its ability of monetary policy evaluation and its performance. The success of IT, however, may critically depend on the presence of strong fiscal, financial and monetary institutions as argued by Calvo and Mishkin (2003) and Mishkin (2004). The essential preconditions for the success of an IT often include the presence of a flexible exchange rate regime and a sound financial system, the lack of high level of financial dollarization (external dominance) and the absence of high levels of public debt and budget deficits (fiscal dominance). The presence of financial dollarization

and a high exchange rate pass through, for instance, may lead to monetary authority to attempt to limit exchange rate volatility and thus to display "fear of floating" as argued by Calvo and Reinhart (2002). This violates the exchange rate regime flexibility precondition and thus the credibility of an IT policy. In this study, we focus on an important precondition, fiscal dominance and investigate the significance of fiscal stance for an IT regime in the context of the recent Turkish experience.

Mishkin (2004, p.6) argues that fiscal sustainability is a crucial necessary condition in controlling inflation and thus in adopting IT regime. This is because, high and unsustainable budget deficits will eventually have to be monetized or public debt will be eroded by a large devaluation both of which will be leading high inflation. Consequently, in the long run, large fiscal deficits will cause inflation targeting regime to break down. Therefore, implementation of inflation targeting needs to be accompanied by a strong fiscal regime. But even with that, in the case of past weaknesses, it takes time for government to gain the full confidence of private agents. This fear of fiscal dominance affects inflation expectations, requiring a tighter monetary policy, which in turn negatively affects the fiscal balance. The challenge, therefore, is to build fiscal and monetary regimes that reinforce one another (Fraga *et al.* 2003; 24).

Even though IT is relatively a new phenomenon in economic literature, the fiscal dominance is not. The pioneering study, which is now well known as "Unpleasant Monetarist Arithmetic" is provided by Sargent and Wallace (1981) by considering the behavior of the government intertemporal budget constraint under monetary policy. Budget deficits are inflationary in the monetarist framework only to the extent that they are monetized. Sargent and Wallace (1981) argue that the monetarist arithmetic might be misleading as it ignores the fact that governments are constrained by their intertemporal budget. According to intertemporal budget constraint, the current real value of government net liabilities by definition must be equal to the present discounted value of future primary surpluses (revenues minus non-interest expenditures). If this constraint can be satisfied without a change in either policy or the price level, then the current fiscal policy is said to be sustainable.

Sargent and Wallace (1981) show that if the government adjusts the primary deficit in order to limit debt accumulation, the central bank is not forced to diminish debt burden by inflation. Such a regime has been called "monetary dominant" or "Ricardian". By contrast, under a "fiscal dominant" or "non-Ricardian" regime, the public sector budget is set independently from its liabilities and fiscal expansion will lead monetization of budget, and then will end with higher inflation. Because in a fiscally dominant environment, the budget must be financed by seigniorage or bond sales, both of which will eventually lead to inflation. Shortly, Sargent and Wallace (1981) argue that bond financing with tight monetary policy may cause higher inflation because decline in money growth will increase debt level with irresponsible fiscal expansion resulting in higher interest payments and higher future deficits. Then, the higher money growth will be required because there is a limit in borrowing so tighter monetary policy with irresponsible fiscal policy will result in higher inflation rates. Thus, under fiscal dominant regime, tight money may lead to an unsustainable debt financing process and thus higher inflation in the long run. Consequently, inflation is a fiscal-driven monetary phenomenon, and nominal monetary growth is endogenously determined by the need to finance exogenously given deficit to satisfy the budget constraint (Tekin-Koru and Özmen, 2003: 591).

The recent fiscal explanation of inflation is provided by the Fiscal Theory of Price Level[1] (FTPL) pioneered by Leeper (1991) and Woodford (1994). According to the FTPL, if the primary budget surplus is exogenous, then the price level is the only variable that can balance the government's intertemporal budget constraint. Consequently, given an exogenous sequence of budget surpluses, there is only one price level which makes the stock of nominal bonds consistent with the present value of those primary surpluses. Thus, following a shock that raises the cost of debt service, if the sequence of primary surpluses does not change, the price level will have to rise in order to keep the government's intertemporal budget constraint balanced. As noted by Tekin-Koru and Özmen (2003: 591):

[1] See Christiano and Fitzgerald (2000), Woodford (2001), Buiter (2002) and Gordon and Leeper (2006) for recent surveys of the FTPL.

> "In the fiscal theory of the price level, …, there is virtually no role for money in the determination of prices in a non-Ricardian world. According to the FTPL, prices adjust to increases in nominal private sector wealth resulting from bond-financed deficits. In this non-Ricardian world, inflation is a symptom of too much nominal wealth chasing too few goods".

The "Unpleasant Monetarist Arithmetic" and "FTPL" literature both show that how an unsustainable fiscal policy may hinder the effectiveness of monetary policy. While these models constitute the basis of the fiscal dominance theory, they may become incompetent to describe the financial markets especially in emerging market countries in a highly global world. That is because these two strands of the literature typically ignore credit risk, a variable at the centre of macroeconomic developments in these countries. Therefore, as argued by Zoli (2005; 4), another methodology is required to analyze the impact of fiscal policy on monetary policy which is through the impact of fiscal policy on credit risk, sovereign spreads, interests rates, exchange rates and hence, inflation. However, most of the empirical literature looks at the impact of fiscal policy on single financial variable, such as interest rates, interest spreads or the exchange rate, without fully exploring the links between them. A couple of recent papers including Blanchard (2004) and Favero and Giavazzi (2004), instead, consider multi-equation models, which are able to investigate different channels of interaction and transmission from fiscal policy to monetary variables. Both of these studies consider the specific case of an IT regime in one of the emerging market country namely, Brazil which has been extremely vulnerable to international capital flow reversals.

The results of Blanchard (2004) and Favero and Giavazzi (2004) suggest that high public debt causes a rise in credit default risk and thus push the economy into a bad equilibrium, where a tight monetary policy may have unconventional effects. The dynamics of the bad equilibrium is described as follows: in a country where the public debt is large, and mainly short-term, an increase in interest rates aimed at keeping inflation within the target, raises the cost of debt service, the debt level, the

default probability and hence the country risk premium, triggering capital outflows and leading to a depreciation, rather than an appreciation of the real domestic exchange rate. If debt is largely denominated in foreign currency, or linked to a foreign currency, the exchange rate depreciation causes a further increase in the value of debt stock. In addition to these, the real exchange rate depreciation affects inflation expectations and eventually inflation itself. To reduce inflation, the central bank has to increase the interest rate again, which further raises the cost of debt service, and so on. Such an economy is a fiscally dominated one, despite there is no expansionary monetary policy like the case in the traditional Sargent and Wallace's (1981) model. Furthermore, the cycle seems to be confirmed to FTPL but the models that use country risk when analyzing the influence of fiscal policy on monetary policy, will explain the procedure explicitly with the realities in emerging markets whereas FTPL only reaches the conclusion through government budget without investigating the procedure in a detailed way.

The importance of fiscal dominance for IT is investigated in some emerging markets like Brazil (Blanchard, 2004 and Favero and Giavazzi, 2004), and Republic of Congo (Nachega, 2005). Studies considering the Turkish evidence include Aktaş *et al* (2005), Çulha *et al* (2006), Emir *et al* (2004, 2005) and Özatay (2007). The aim of this study is to contribute this literature by investigating the relevance of fiscal dominance arguments for the recent Turkish experience with IT. The plan of the rest of this thesis is as follows. Chapter II briefly overviews the inflation problem and fiscal stance of Turkey in terms of debt and fiscal structure since the 1990s. In Chapter III, we provide a literature review of theoretical models and present two basic models along which are inspired from Blanchard's (2004) article about fiscal dominance in Brazil. The first model considers the effects of country risk, the domestic and foreign real interest rates on the real domestic exchange rate through capital flows relation whilst the second model aims to find out the foreign and domestic determinants of country risk. Chapter IV is devoted to the analysis of data, model estimation results and their discussion in the context of the relevance of the fiscal dominance for IT in Turkey. The last part concludes the thesis. Additional

information (tables, figures) and some details about the empirical study are presented in Appendices A, B and C.

CHAPTER II

INFLATION AND FISCAL STANCE IN TURKEY: AN OVERVIEW

2.1. Inflation Challenge in Turkey

Until very recently, severely high inflation rates persisted through more than three decades had been one of the major macroeconomic problems of Turkey. The high public deficit, high debt stock and the financing method of these deficits accompanied with increasing risk premium and real interest rates are often postulated as the main reasons of this persistently high inflation[2].

Basically, the years 1990s are accompanied with political instabilities, insufficient and incomplete structural reforms, and high real interest rates, critically high level of debt stock, volatile growth rates and fragile banking system. But apart from these, high inflation rates are seemed to be more important and thus almost all politicians have included the issue of high inflation rates into their economic programs. However, a permanent success was never attained. Generally, these disinflation programs based on various types of nominal anchoring and monetary tightening, rather than following any tight fiscal policy to decrease the public sector borrowing requirements until the economic program of 1998 (Aysoy *et al*, 2005; 41). For instance, during 1990s the main task of CBRT is to cope with weak financial system, high real interest rates and roll overing of debt stock. For that reason, the tight

[2] The studies investigating Turkish inflation include Özatay (1997, 2007), Tekin-Koru and Özmen (2003), Domaç (2004) and Aktaş, Kaya and Özlale (2005)

monetary policy implemented in 1990s became inefficient in managing inflation; on the contrary this resulted in a reverse conclusion with higher inflation rates. Basically, in that period, higher interest rates are used along with tight monetary policies to restrict the movements in foreign exchange rate. In addition, by employing all these policies, CBRT also achieved to attract capital inflows. But without an improvement in fiscal stance, high real interest rates added to fiscal deficit and high debt stock.

As a result of these weaknesses in the economy, a new program was prepared with IMF in 1998 and some fiscal measures were taken, but the real interest rates continued to protect its high levels and kept going to affect fiscal stance negatively. In addition to high real interest rates, the 1999 economic crisis in Russia, 1999 general elections and the earthquake in the same year also enlarged the fiscal deficits and prevented the program to be successful. As a result, high fiscal deficits mainly due to high real interest rates leads inflationary expectations since public had been expecting that government would eventually monetarize its deficit. This was followed by higher inflation, in turn again higher nominal interest rates. This supports the theory of Sargent and Wallace (1981), such that tight monetary policy with weak fiscal system in Turkey during 1990s eventually resulted in inflation. (Usta, 2003; 18). In addition, Saçkan (2006; 85) analyzed the Turkish economy through 1988-2005 according to FTPL literature and concluded that the period before 2001 was a fiscally dominant regime due to loose fiscal policies with high deficits but it has tuned to be monetary dominant after 2001 which has been characterized with increasing fiscal discipline.

Figure 1 clearly shows the severity of the problem until 2001. For instance; the inflation ascended to 125 percent in 1994 and it was above 60 percent in all years from 1990 to 2000. Following 1998 Russian crisis and the earthquake in 1999, Turkish economy entered an unsustainable economic path by the end of 1999. In order to cope with these weaknesses in the economy, a new stabilization program had begun to be implemented in 1999 but unfortunately it experienced two deep financial crisis; one in November 2000 and the other is in February 2001.

After that, Turkey has started to implement a new program called "Implicit Inflation Targeting" since May 2001 by abandoning the regime of exchange rate targeting. That is, the Central Bank has started to use the overnight interest rates as the policy instrument in a forward-looking manner to achieve the inflation targets, which are jointly set by the government. Moreover, this program has included a structural transformation in the economy and therefore gave importance to the implementation of key structural reforms in public finance, banking sector and also to the implementation of responsible fiscal and monetary policies with the aim of placing the Turkish economy on a sustainable growth path. [3]

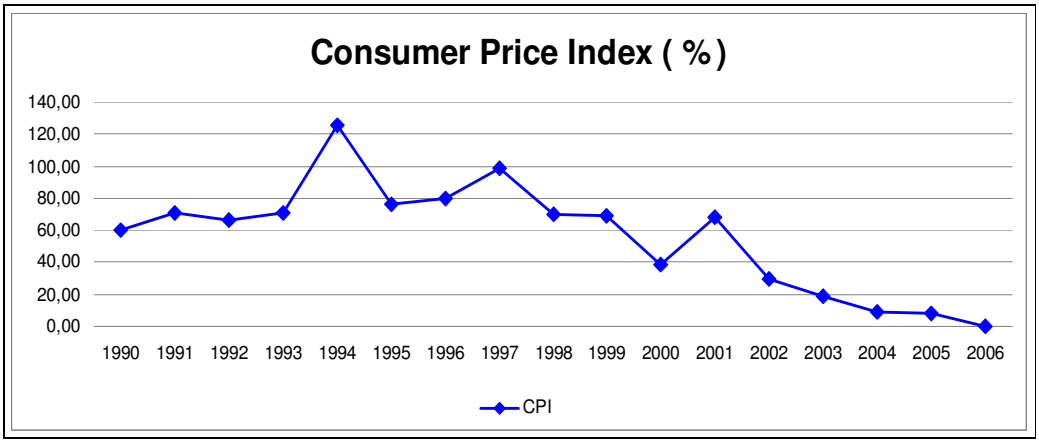


Figure 1: Consumer Price Index (Percentage) between 1990 and 2006

Source: CBRT

The new policy is called 'Implicit Inflation Targeting' in order to preserve the Central Bank credibility. The reason behind this is that Turkish economy did not, indeed, meet the initial conditions of IT thus the term 'implicit' is used until the beginning of 2006. Actually, the programme seems to be successful such that; inflation expectations have followed a downward trend, it undershot the inflation targets in the following two years. The main contribution to lower levels of inflation has come from fiscal discipline and continuing structural reforms. The Consumer

[3] See Aktaş *et al*. (2005)

Price Index inflation which is the target of Central Bank was 29,7 percent in 2002 that is below the target of 35 percent and it was 18,4 percent in 2003 that is below the target 20 percent. In addition, the new program has managed to decrease inflation from 68,5 percent in 2001 to 9,65 percent in 2006. (Figure 1)

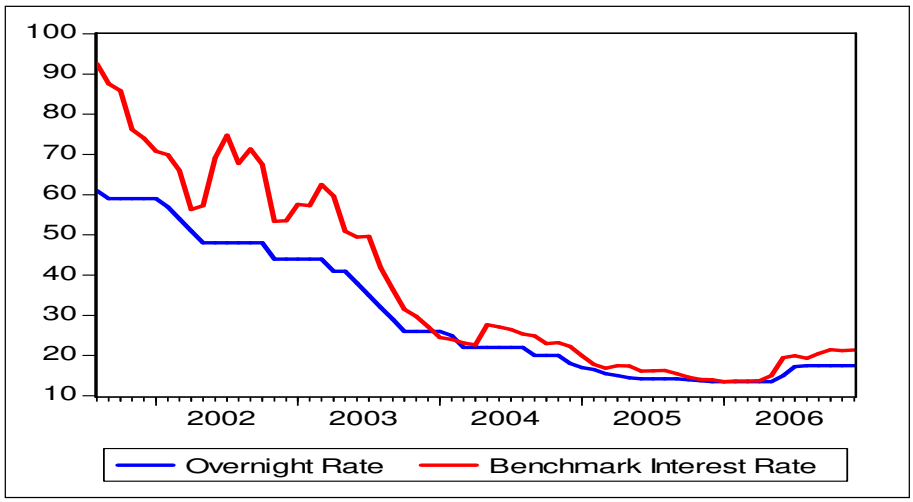


Figure 2: The Relation between İstanbul Stock Exchange (ISE) Benchmark Interest Rate and Central Bank Overnight Rate

Source: CBRT

Implementing an IT policy regime in a country with a recent memory of severe high inflation and thus loose monetary policy credibility was not an easy task. Furthermore, the fiscal dominance has put a severe constraint on monetary authority in implementing the IT. The basic reason is that, similar to many other emerging countries, the fiscal stance has yet to be apparently sustainable[4], which is a critical issue for IT. In the conventional monetary policy transmission mechanism, in order to fight with inflation Central Bank increases policy rate to halt down excess demand and thus inflation expectations. However, in the presence of an unsustainable fiscal

[4] See Özatay (1997) , Özmen and Koğar (1998), Agenor, *et al.,* (2006) and Gürcihan *et al*., (2007) for studies on the sustainability of budget deficits in Turkey. .

stance, increased interest rates may lead to an increase in the risk premium and possibly to a reverse result that is postulated by the conventional mechanism. Furthermore, the other challenge is the relation between CBRT policy rate and the market interest rates which is the interest rate that directly affects consumption and investment decisions (aggregate demand) and then inflation. In fact, with stable risk premium, market interest rates are mainly determined by the expected future short term interest rates. But, this may not be the case for Turkey even though there has been some improvements. Figure 2 attempts to illustrate this relation by using ISE Benchmark interest rate and Central Bank overnight rate. Benchmark interest rate is used since it is the interest rate of the most liquid bonds with longest maturity, thus it is a good indicator of market interest rate. Additionally, the bond market is the most important channel that short term rates transferred to market rates. At first glance, it seems that the benchmark and overnight rate have similar trends and the link may not be very strong during the whole period as there are some deviations resulting from risk premium which is related to fragile debt stock and external uncertainties. Even the decreasing trend of Turkish risk premium[5] which provides the medium term approach with increasing certainty and confidence[6], the risk has not been eliminated totally. For that reason, the effectiveness of transmission mechanism from interest rates to real sector has still been a debatable issue.

Implementing inflation targeting in Turkey even the implicit one has not been an easy task as already discussed. For instance, CBRT increased the policy interest rate in July 2001, but this resulted in failure; the interest rates in all maturities moved upwards and the real domestic currency was depreciated because an increase in interest rate affects economic agents' expectations negatively (Özatay, 2007). Then, Central Bank has never raised interest rates until August 2006 that is the period of increasing volatility in international financial markets. These proved that the strengthening trend of economic fundamentals does not always end with success. For instance, between February and August 2001 and the following month of September

[5] See Appendix A3

[6] See İnal (2006), Emir (2004).

11 attacks, interest rate has kept its high levels and the Turkish Lira has continued to depreciate despite improvements in macroeconomic fundamentals. Furthermore, all these led to a vicious cycle, such that increasing concerns about the sustainability of domestic debts lead further increase in the interest rates due to the rise in risk premium, and further depreciation of domestic currency. In other words, a self-fulfilling process was observed thus it could be concluded that only strengthening economic fundamentals is not sufficient for reaching the inflation targets. This mainly stems from the expectations and risk perceptions of public such that with similar economic fundamentals, optimistic expectations will move the economy to good equilibrium with lower risk premium, interest rate and exchange rate; on the other hand pessimistic expectations will have pervasive results. In other words, there can be more than one equilibrium to be attained at any time in an economy.

For the reasons discussed above, during the implicit IT period, CBRT chooses to prepare institutional framework, improves communication with public and tries to gain public confidence to regime and to bank itself, additionally tries to manage public expectations.[7] In almost all Central Bank announcements, it has stated the importance of fiscal discipline. Thus, this structure of the economy from starting date of IT till now makes fiscal policy and debt stock management the center of attention with IT regime and became one of the most debating issues. Thus this thesis tries to analyze the fiscal dominance phenomenon in Turkey in IT era taking the default risk as the center of the empirical work.

2.2. Fiscal Stance of Turkey

One of the major common problems of developing countries including Turkey is high debt stock since it affects expectations of public negatively, discourage private investment, worsen growth rates, and often lead to financial crises. In order to finance its expenses, governments have three tools: taxes, seigniorage and borrowing. But both taxes and seigniorage have direct negative effects on economy so neither politician nor the economic agents prefer these financing instruments to be

[7] See Aktaş *et al*. (2005)

used. So borrowing rises in a synchronized manner with increasing government activities, but it is more crucial for countries which are inefficient in creating resources to finance their activities. High debt level and its sustainability is also important for this paper since it is the reflection of fiscal policy to the economy and as discussed before debt level, fiscal stance and their sustainabilities are one of the major prerequisites for successful IT.

In the economic literature, generally there are two methods in order to analyze the debt sustainability's of countries. One of them is present value approach which deals with government budget constraint. According to this constraint, the debt is said to be sustainable if the current debt stock level is equal to the discounted value of future primary balance (Chalk and Hemming, 2000). Second one is standard accounting approach which investigates whether long term debt to income ratio is constant or not (Geithher, 2002). In fact, there are three determinants of debt stock to Gross Domestic Product (GDP) ratio: the real interest rate, the real growth rate of GDP and the ratio of primary balance to GDP. While net interest payment increases extra borrowing necessity, positive primary balance enables government to pay its debt. Additionally, if real growth rate is higher than real interest rate, this also contributes to decreasing the ratio of debt to GDP. But in addition to these, the initial level of debt and exchange rate are also important for the evolution of debt to GDP ratio. Exchange rate depreciation will lead to increase debt stock if the level of external or foreign exchange indexed debt is existed in high levels. However, among these factors, there is only one factor that government can use effectively and directly while managing the debt stock that is primary balance which is one of the sustainability indicator of debt. A tight fiscal policy, in order to keep budget balance under control and to give sufficient primary surplus, will push the real interest rates down by decreasing risk premium through increasing public confidence about the sustainability of debt. So with tight fiscal policy, government could also control the two important factors of debt to GDP ratio; the primary balance and the real interest rates. In first glance, it seems to be that the real GDP growth rate, the other significant factor for the evolution of debt to GDP ratio, will be affected negatively due to the decrease in government demand with tight fiscal policy. But the fiscal

discipline and the public confidence may compensate the decrease in government demand through decrease in real interest rates and increase in private expectations.[8] But in the reverse case, in countries where fiscal deficit and debt stock is high, borrowing to finance deficit increases the interest rates by worsening the risk premium. Thus, low level of primary balance deficit calls for extra borrowing, extra interest payments and so on. In addition, high debt level will worsen public confidence and expectations about sustainability of debt and stability of the economy which will consequently shorten the maturities and increase volatility of exchange rates. In fact, debt stock structured like that is an important factor that triggers the economic crisis.[9] In this context, expectations of public become very important and in order to gain credibility, the major method that government could follow is to implement tight fiscal policies and by doing this to give primary surplus.

For Turkey, high debt stock and its sustainability is a major problem since 1990s. Actually in these years, debt related financial instruments are so widespread in Turkish financing tools due to insufficient financial and institutional infrastructure. Thus, weak banking system accompanied with balance sheets carrying high amount of domestic public debt leads real interest rates to raise (Celasun, 2002). However, in Turkey, the importance of debt is started to be discussed especially after February 2001 financial crisis. In addition, it could be concluded that one of the main reasons of major economic crisis in Turkey is its fiscal indiscipline and high debt stocks. Generally, public debt stock in Turkey is characterized with short maturities with a significant share denominated in or indexed to foreign exchange. This structure makes debt stock and debt service vulnerable to the movements in the interest and the exchange rate as discussed above. Thus, this fragile structure of debt forces public sector to bear the risk resulted from interest and foreign exchange rate volatilities (Gürcihan *et al*, 2007; 18).

In 1990 public net debt stock over GNP 29 percent, while it was 57,1 percent just one year before the February 2001 crisis and it was 90,4 percent in the year of

[8] See Emir *et al.* (2005)

[9] IMF and World Bank Guidelines (2001)

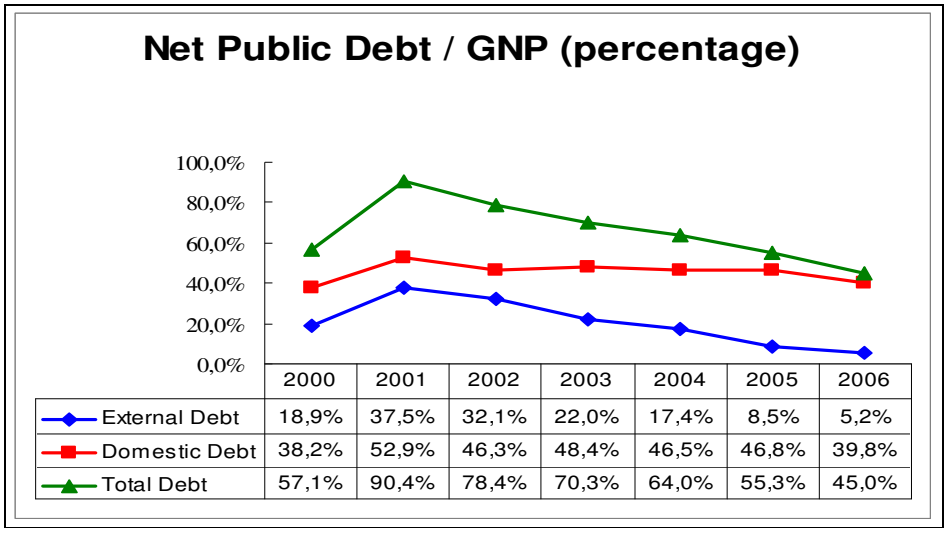
economic crisis. The increase has been more severe in net domestic debt. It was 6 percent in 1990, but reached 38 percent in 2000 and 52,9 percent in 2001. The main reason of this increase was due to primary balance deficits in the first half of 1990s and it was due to high real interest rates in the second part of the decade. In fact, between 1990 and 1994, the primary balance deficit over GNP was 5,8 percent where it gave 0,1 percent surplus between 1995 and 2000. This means that in spite of a recovery in primary balance, the debt stock level has increased due to high levels of interest rates. Because at the same period, operational deficit was 8,3 percent and 5,8 percent respectively which measures the budget balance by removing the inflationary pressure on interest payments.[10] Treasury Public Debt Management Report of April 2003 summarizes the other main reasons of fiscal deficits at those periods as: duty losses via state banks, excessive public sector employment, high wages not matched by productivity, costly high public investments, high deficits of social security institutions, high and inefficient agricultural support policies, unproductive and costly facilities of State Economic Enterprises' (SEEs). In addition to these, central authority could not control extra budgetary institutions and revolving funds expenditures, so this corrupted the budget discipline and its transparency, accountability and as a result its efficiency. On the other hand, the problem on the revenue side is high tax rates with low tax base, as a result low and unfairly collection of tax. To sum up, all these inefficiencies in fiscal policy resulted in high fiscal deficits and high debt stock.

For these reasons, initially in order to break down the vicious cycle between debt and interest rates which is the most important factor behind high debt stock, carrying out fiscal discipline and active debt management policies become inevitable in the context of new stabilization program which is started to be implemented after February 2001 crisis. But initially, the new program has resulted in a rise in public debt to Gross National Product (GNP) ratio due to the recovery actions of banking sector. However, through the late 2001, the program has started to work such that public debt to GNP ratio has begun to follow a decreasing trend.

[10] See Treasury Public Debt Management Reports (April 2003)

Since 2001, firstly the economy has started to recover with implementing fiscal discipline and structural reforms and then started to grow even with extremely tight fiscal policy. It was also observed in some other countries and this issue is widely investigated in the literature as "expansionary fiscal contraction". As a result, the growth rate has also helped to recovery of fiscal stance. On the other hand, after 2001, the main negative developments that increase the vulnerability of the economy have been the deterioration of the current account deficit.

In addition, the imposed program with monetary and fiscal discipline and the accompanying structural reforms need time in order to be fully successful. Thus, during this period the economy still maintains its sensitivity to debt sustainability (Emir *et al*, 2004; 21). In 2001, net public debt to GNP ratio climbed to 90,4 percent, but it started to fall since then, in addition maintains its decreasing trend up to now. That it falls to 45 percent in 2006. (Figure 3)



	2000	2001	2002	2003	2004	2005	2006
External Debt	18,9%	37,5%	32,1%	22,0%	17,4%	8,5%	5,2%
Domestic Debt	38,2%	52,9%	46,3%	48,4%	46,5%	46,8%	39,8%
Total Debt	57,1%	90,4%	78,4%	70,3%	64,0%	55,3%	45,0%

Figure 3: Net Public Debt Stock over GNP (2000-2006) (percentage)

Source: Republic of Turkey Prime Ministery Undersecretariat of Treasury

Moreover, once the net public debt to GNP ratio trend is analyzed whether the domestic debt dominance continues or not, it is seen that, even with the latest stabilization program, the domestic debt maintains its dominance over the external debt. Actually the gap between them is expanded between the same period because there is a remarkable fall in external debt to GNP ratio such that it was 37,5 percent in 2001 but falled to 5,2 percent in 2006. However, the situation is not so bright for domestic debt it was 52,9 percent in 2001 and falled to only 39 percent in 2006 (Figure 3). The main reason behind this is that, especially after the crisis, borrowing from abroad has become more difficult.

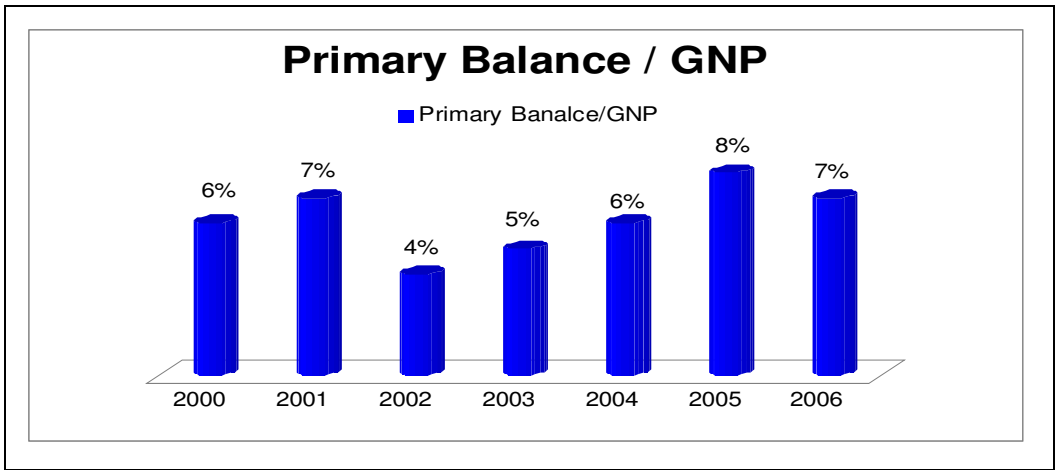


Figure 4: Primary Balance over GNP (2000-2006)

Source: Republic of Turkey Ministery of Finance

In addition, the most important aim of the fiscal policy in the new stabilization program is to give positive primary balance. The reason is that without guarantees of continuing primary surpluses, the economy will be most probably subjected to self-fulfilling prophesies especially in highly debted countries. For instance, Pastore and Pinotti (2005;5-16) and Blanchard (2004;27) show that during Brazil's 2002 elections, some doubts were emerged about government's commitment to primary surpluses and this led risk premiums to rise and real exchange rate to fall, validating

the expectation of higher debt. In fact, this is a situation that any emerging market with fragile fiscal position could be confronted. For that reason, fiscal authority in Turkey, has gave full weight to maintain high primary surpluses between 2001 and 2006 by implementing tight fiscal policies. Since then, the primary balance has increased continuously and attained the targets which are determined with IMF. For instance, the budget gave 7 percent surplus in 2001 but this falled to 4 percent in 2002 but since then increased continuously up to 2006 which is again 7 percent in that year (Figure 4).

Table 1: Interest Rate and Currency Composition of Total Debt Stock (Percentage)

	2003	**2004**	**2005**	**2006**
Total Debt Stock	**100**	**100**	**100**	**100**
Fixed Rate	48	53,8	50,4	54
Variable Rate	52	46,2	49,6	46
TL	**48,6**	**58,5**	**62,4**	**62,8**
Fixed Rate	21,2	30	30,6	32,3
Variable Rate	27,4	28,5	31,8	30,5
Foreign Exchange	**44,3**	**38,5**	**35,9**	**36,7**
Fixed Rate	26,9	23,7	19,8	21,7
Variable Rate	17,4	14,8	16,1	15
Indexed to Foreign Exchange	**7,1**	**3**	**1,7**	**0,5**
Fixed Rate	0,1	0	0	0
Variable Rate	7	3	1,7	0,5

Source: Republic of Turkey Prime Ministery Undersecretariat of Treasury

However, the most important thing in debt management is not the ratio of debt to GNP but also its currency composition and maturity is crucial. The main reason behind foreign currency denominated, short termed with variable rate debt is known as “original sin” in the economic literature which means that countries are incapable of borrowing on their own currencies in long horizon and fixed rate since generally the other agents do not want to undertake currency risk (Hausmann *et al.* 2001). In fact this is the main reason that exchange rate has to be added to the debt

sustainability function as another indicator. In addition, also high debt levels and uncertainty about fiscal policies make maturities of debt shorter. For these reasons, in Turkey, the debt structure is mainly characterized with short maturity at variable rate and foreign exchange denominated or indexed which make debt sustainability vulnerable to interest and exchange rate movements. Even it has a decreasing trend, nearly half of the total debt stock (46 percent) is at variable rate and 36,7 percent is denominated in foreign currency while a smaller fraction nearly 0,5 percent is indexed to foreign exchange rate.

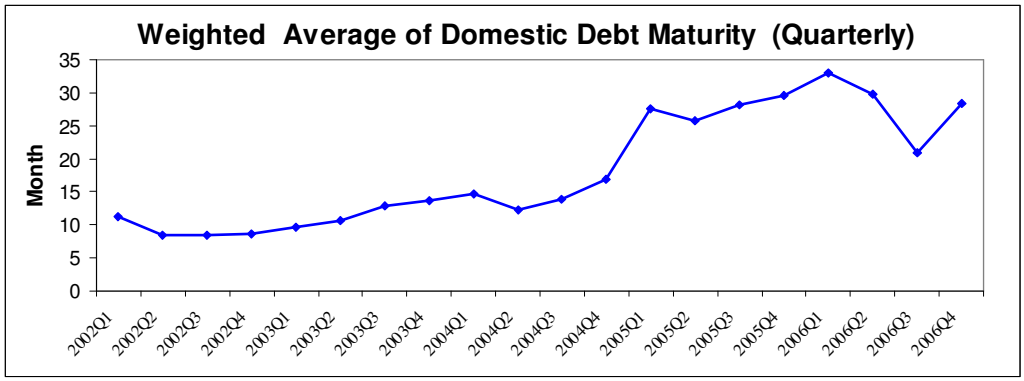


Figure 5: Average Weighted Maturity of Domestic Debt (Quarterly)

Source: Republic of Turkey Prime Ministery Undersecretariat of Treasury

With a debt structure like that, government not only has to borrow at low cost rates but also it has to consider unexpected changes in interest rates due to lower maturities and exchange rates due to foreign exchange denominated debt. In fact, the average maturity captures the risk perception of people while lending to government. After 2001, with tight fiscal policies, as expectations about fiscal policy gets better, the maturities become longer but they are still short (Figure 6). While the average weighted domestic debt maturity was 9 months in 2002, it has hiked to 27,4 months in 2006. The average maturity of bond issued in American Dollar was 5 years in

2001 but it has been 22,4 years in 2006 and in Euro it was 3 years in 2001 but 10,1 years in 2006.[11]

Both fragilities are important for inflation targeting framework. Because, when there is a fluctuation in the exchange rate or interest rates, there will be corresponding fluctuations in debt ratio if the debt is largely denominated in foreign currency and in short maturity. If the debt is perceived as unsustainable, the economy may fall into a vicious circle of further depreciation and increase in risk premium and further increase in interest rate and further increase in the debt ratio. Thus these situations make monetary policy ineffective so fiscal policy has to be adjusted to the change in the real exchange rate or risk premium.

To sum up, in Turkey for the sustainability of debt and success of inflation targeting, fiscal discipline is inevitable. Gürcihan *et al.* (2007; 19) indicates that risk included (interest rate and exchange rate risk) debt stock has an decreasing trend since 2002 but it starts to reach higher levels since the first quarter of 2005 compared to years before 2001. So even the debt stock has a decreasing trend, due to its structure discussed above it protects its severity in the economy through affecting country risk and the other economic fundamentals.

[11] See Treasury Public Debt Management Reports published querterly (2003:4-2006-12)

CHAPTER III

INFLATION TARGETING UNDER FISCAL DOMINANCE

In an IT regime, central banks use short-term interest rates as a main policy tool in order to take inflation under control. For instance, once inflation expectations emerged, central banks increase their policy rate to restrict the demand and expectations through monetary transmission mechanism. As Blanchard (2004; 4) summarizes; in the conventional open economy macroeconomics, when policy rates are increased, this affects inflation in three ways. First, higher real interest rates restrict the aggregate demand and thus output expansion and then lastly inflation. Second, higher real interest rates lead to a real appreciation by attracting capital inflows. The appreciation then will decrease inflation both through lower import prices and smaller aggregate demand by lower net exports. Thirdly, with these linkages and with rational thinking, the expectations about inflation will be improved unless there has not any vulnerability in the economy, and this also adds to inflation targeting policy positively.

On the other hand, if the economy has some vulnerabilities like high debt stock and weak fiscal discipline, a rise in the real interest rate also increases the probability of default on debt. However, this will make domestic government debt less attractive and capital outflow and thus leads to a real depreciation of the domestic currency. Blanchard (2004; 16) concluded that such an outcome is more likely the higher the initial level of debt, the higher the proportion of foreign-currency-denominated debt,

and risk aversion of foreign investors. In such a case, contrary to the conventional transmission mechanism, inflation targeting central bank could found itself in a vicious circle. An increase in the real interest in response to higher inflation will not lead to a real appreciation but rather real depreciation. Then, the real depreciation resulted in a further increase in inflation by stimulating aggregate demand and by rising import prices which eventually may dominate the standard aggregate demand channel. In that case, a further increase in interest rate is necessary to fight with inflation according to IT regime, but this will lead further depreciation and so on. Also in this cycle, expectations may turn to negative and this adds more to depreciation and inflation itself. As a result, it is seen that in such a situation, where the fiscal stance is dominant due to its weaknesses, monetary policy is not the only right instrument to fight with inflation, but rather tight fiscal policy must be accompanied with monetary policy.

In this study we consider basically two models in order to evaluate the dependency of inflation targeting on fiscal policy in Turkey covering the period of IT era. The first model is estimated in order to determine the effect of the country risk and of the domestic and foreign real interest rates, on the real exchange rate through a capital flows relation. The second model formulates the influence of domestic and international factors on country risk. In fact, in order to analyze the fiscal dominance phenomenon, the most important determinant of country risk is seemed to be debt dynamics as Blanchard (2004) did for Brazil. However, in this study, a larger set of explanatory variables are considered to look country risk from a broader perspective.

3.1. The Capital Flow Relation Model

The first model aims to evaluate the effects of country risk premium, domestic and foreign real interest rates on the real exchange rate. In fact, this relation is nothing but a version of Uncovered Interest Parity (UIP) assumption which is an important building block for macroeconomic analysis of open economies. The UIP equation is formulated as:

(1) $$i_t - i_t^* = E_t(e_{t+1}) - e_t + RP_t$$

where i_t is the domestic interest rate at time t, i_t^* is the foreign interest rate at time t, e_t is the domestic exchange rate at time t, $E_t(e_{t+1})$ is the expected exchange rate at time $t+1$, and RP_t is the country risk premium at time t. It provides a simple relationship between the two countries' interest rates and the expected rate of change in the spot real exchange rate of two countries. According to the UIP condition, a rise in the domestic interest rates will lower e_t; appreciates the exchange rate if $E_t(e_{t+1})$ and RP_t are kept constant. This is the effect suggested by the traditional view.

Model 2 closely follows Blanchard (2004; 18) and is a simplified version of the UIP relation based on capital flows. The real exchange rate *(e)* is based on the domestic *(r)*, foreign real interest rate *(r*)* and country risk premium *(pØ*)* which covers both probability of default *(p)* and risk aversion (the reverse of risk appetite) of foreigners. All variables are in logarithm and lastly the error term *(ε)* captures all remaining factors excluded in the model.

(2) $$log\,(e) = \alpha_1 + \alpha_2\, log\,(r) + \alpha_3\, log\,(r^*) + \alpha_4\, log\,(p\emptyset^*) + \varepsilon$$

In the standard open macroeconomics, the expected sign of α_2 is positive since the higher the domestic real interest rate the larger will be the capital inflows and this will lead real appreciation of domestic exchange rate[12]. On the other hand, α_3 is expected to be negative, since the reverse relation is valid for foreign real interest rate that is the higher the rate, the higher will be capital outflows and the higher the probability of depreciation. In addition, the expected sign of α_4 is negative since the higher the country risk, the larger will be the capital outflows and this will resulted in

[12] A fall in *(e)* means appreciation of Turkish Lira

the real depreciation. Related to this capital flows relation, Keynes (1923; 126-127) concluded that investors' choices between foreign and domestic assets do not only depend on interest rates and exchange rates but rather exchange rate risks and credit risks are interrelated, and that the magnitudes of these risks reflect the relative macro economical, financial and political conditions and uncertainties of the countries that have influence investors decisions.

To sum up, if interest rate rises given the country risk, the standard channel through monetary policy affects the exchange rate and leads to real appreciation. But the UIP condition not always works out as the conventional way. For instance, Giavazzi and Favero (2004; 14) explained the unconventional feature of UIP more precisely from another perspective as:

> "Assume $E_t(e_{t+1}) - e_t = i_t + RP_t$ and $i_t = -\lambda RP_t$ that is monetary policy responds directly to the exchange rate risk premium: an increase in, RP_t leads to lower domestic interest rates. Then $E_t(e_{t+1}) - e_t = -[(1 - \lambda) / \lambda]$ it: in other words, the reason for the negative correlation is the deviation from UIRP (RP_t), coupled with a monetary policy rule that responds to RP_t ".

In fact, this explanation supports the one side of the argument that monetary policy responds to risk premium via interest rates. However, also sometimes risk premium will respond to interest rate changes through debt level and risk perception of investors. Even though a higher interest rate may make investment in local currency denominated assets more attractive, the higher default probabilities due to unsustainable debt dynamics and other riskiness of the economy may offset the attractiveness of higher interest rates and may discourage the foreign investors by resulting capital outflows and real exchange rate depreciation. Thus, it could be summarized that, the relation between risk premium and interest rates through debt dynamics and monetary policy actions will resulted in a vicious cycle and will break down the conventional capital flows relation.

3.1.1. The Capital Flow Relation: A Brief Literature Review

Capital flows as discussed in the previous part has important influences on countries' key macroeconomic variables and with increased globalization of the world economy over the past decade, developing countries has become more dependent on the developed ones especially through capital movements. In addition, there is a large and growing debate in the literature that whether the main determinants of these flows are domestic or international. For instance, Arora *et al.* (2001; 490) argues that while the dramatic rise in capital flows to emerging markets has primarily depended on the strength of the macroeconomic policies and implementation of wide structural reforms in these countries, it has also depended on the changing conditions in industrial countries which has influenced the foreigners' investment decision whether to diversify their portfolios into developing country assets or not. For example, Calvo *et al*. (1993) argues that US interest rates being a developed country is a determinant of capital flows to emerging markets such that with decreasing US interest rates, capital flows that go to emerging market countries are increased. Favero and Giavazzi (2004) concludes that all financial variables in Brazil between 1999 and 2003 fluctuate in parallel with the EMBI spread. Importantly, the exchange rate fluctuations with EMBI spread is through capital flows, that is an increase in the country risk premium leads to a sudden stop of capital inflows and resulted in real depreciation, by this capital outflows are compensated by an increase in trade surplus. Favero and Giavazzi (2004) also explain the way that how the domestic interest rates at all maturities are affected by fluctuations in the EMBI spread. In the policy rate Selic, the mechanism works via the exchange rate and inflation expectations that is the Central Bank of Brazil looks movements in exchange rate as a result of a change in risk premium when deciding on the level of the Selic rate. In addition, the domestic interest rates are also affected by the EMBI spread through the Selic term premia which are affected by default risk. So the results of Favero and Giavazzi (2004) for Brazil also support the unconventional UIP condition when country risk, closely related with other macroeconomic fundamentals, is so volatile

due to weak fiscal stance. Blanchard (2004) explains the positive link between the exchange rate and the interest rate by the default risk. A rise in the interest rate due to an increase in the default risk triggers capital outflows and causes the domestic currency to depreciate. But, according to that model unless the default risk change (with no change in debt level and risk appetite of foreigners), a rise in the interest rate would cause appreciation as a result of capital inflows as the portfolio model predicts in conventional circumstances. In addition, Blanchard (2004), concluded that: "The higher the debt stock, the higher the proportion of foreign currency denominated debt, the higher the risk aversion of investors, then the higher the probability of depreciation than appreciation as a result of an increase in interest rates" which has confirmed to Brazilian economy in 2002.

There are also some works about the Turkish case. One of them is on the validity of UIP condition for the Turkish data, conducted by Aysoy and Kıpıcı (2002). They construct a small-scale quarterly macro econometric model of the Turkish economy covering the period from 1987 to 2001. Aysoy and Kıpıcı (2002) use the overnight interest rate as the domestic interest rate variable, since it represents the policy instrument used by the Central Bank to tighten the monetary policy in order to stabilize the movements in the exchange rate in that period. They find that an increase in the overnight interest rate results in a depreciation of the nominal exchange rate. Even though the increase in interest rates leads to exchange rate appreciation on impact, this result is insignificant and the significant long-run result implies exchange rate depreciation. In addition, Agenor *et al.* (1997) estimate a VAR model in order to examine the links between fiscal policy, uncovered interest rate differentials, the real exchange rate, and capital inflows in Turkey since the late 1980's. According to their results, an increase in the interest rate differential leads to an appreciation of the real exchange rate and the effect is significant. Berument (2001) uses the spread between the interbank interest rate and estimates a VAR model covering the period from 1986 to 2000 for Turkey. He finds that tight monetary policy leads to the appreciation of the domestic currency. Aktaş *et al.* (2005) make up a model-based risk premium from structural model which is associated only with Turkish domestic fundamentals after the crisis period in 2001. Then, they make up some simulations based on UIP and the

risk premium they formulated. According to their simulation results, firstly when Central Bank increases its policy rate one percentage point on September 2003, there is an initial appreciation but as risk premium increases in three months, this leads depreciation of domestic currency. This result is due to the UIP condition which works in an unconventional way through a rise in debt stock and than through a rise in risk premium. Secondly, when risk premium increased five points on September 2003, depreciation rate and inflation rate moved in the same direction with risk premium. Thirdly, they decreased the Central Bank overnight rate 2.18 percentage points on July 2001 which is actually the date that CBRT increased its policy rate only once. But in the simulation, the reverse is experienced and totally reverse result was attained. When Central Bank increases the rate on July 2001, it resulted in depreciation and a rise in inflation due to higher risk premium since public perception was on the way that 'things are not going in the right direction'[13]. On the other hand in the simulation, the fall in the interest rate resulted in appreciation since this time public perception was in the way that 'things will go better'. To sum up, for both Turkey and some other EMs, the unconventional capital flow relation may be experienced mainly due to country risk premium of countries.

3.2. The Country Risk Relation Model

The second model aims to analyze the determinants of country risk. In the literature, country risk is often proxied by sovereign bond spreads, which is the difference between interest rates on sovereign bonds of emerging market countries and U.S. treasury securities of the same maturities. The general formulation of spread comes from the arbitrage opportunity between risky and risk free bonds:

$$(1+r^*) = p\,(1+r) + (1-p)\,0 \qquad (3)$$

[13] See Emir *et al*. (2005; 20)

Where r^* is the risk free return, r is the risky return and p is the probability of default. Then, in equilibrium the spread s can be formulated as: [14]

$$(4) \qquad s = (1+ r)(1-p) = (1+r^*)(1+p)/p$$

There are different models in the economic literature that tries to analyze the determinants of sovereign bond spreads, as proxy of country risk but the general model covered in the literature is;

$$(5) \qquad s_t = \alpha_0 + \alpha_1 r_{us,t} + \alpha_2 \varnothing_t^* + \sum_{i=1}^{n} \alpha_i x_{i,t} + \upsilon_t$$

where s is the log of EMBI spreads, α_0 is a constant, r_{ust} is the return of US treasury bonds or Federal Funds Rate, $\varnothing^*$ is a proxy for the risk aversion of foreign investors (inverse of risk appetite), x_i is the i^{th} domestic macroeconomic variable, and υ covers the remaining terms. The domestic macroeconomic variables will include fiscal balance, debt stock, current account, net foreign assets, gross reserves all as ratio of GDP and also debt service ratios, inflation, per capita income, GDP growth, central bank policy rate, default history, credit ratings. When US interest rates increase, also the spread will increase. There are some explanations to this fact in the literature and the first is due to the default risk in other countries especially in emerging ones. With increasing US interest rates, emerging markets (EMs) have to offer higher interest rates than risk free rates when borrowing and attracting capital inflow in order to compensate the default risk of their own. Secondly, higher US interest rates rise the debt burden of EMs and all these decreases the repayment probability of debt again resulting in higher spreads (Arora and Cerisol, 2001; 476). Thirdly, as Kamin and Kleist (1999) discuss, investors' risk aversion will be affected by a change in U.S. rates and when their risk aversion increases due to higher US interest rate, the

[14] See Arora (2001; 476)

investor will not prefer risky markets to invest and this reduces the availability of funds to EMs. For all these reasons α_1 is expected to be positive. In addition, the coefficient in front of the foreigners risk aversion variable α_2 is also expected to be positive, since as risk aversion increase, they will be less willing to take risk and to buy emerging market countries assets, thus the spread will increase. Lastly the sign of the coefficient of domestic macroeconomic variables α_i will change whether the variable seems to be a risk or a contribution for the stability of the economy. If the variable is the one that contributes to country risk than the sign will be positive, but if reverse is true than it will be negative.

The thesis takes the capital flows relations model as similar as Blanchard's (2004) but expand the second model. Blanchard's (2004) model regresses the probability of default only on next period expected level of debt, which itself depends on the exchange rate, the interest rate, and the current level of debt and probability of default. But here the model will cover both domestic and international factors. The international factors that will affect the spread will include risk appetite; international liquidity as an indicator of global economic condition, U.S. FED interest rates; as a determinant of U.S. monetary policy. In addition, a significant proportion of fluctuations in emerging market spreads are driven by country specific fundamentals which are standard country creditworthiness indicators. The domestic fundamentals included in to model are real debt, real consolidated budget balance, current account deficit, gross international reserves and credit ratings. This second model not only helps to investigate fiscal dominance phenomenon but also gives answer to how to reduce country risk which is important for the sustainability of inflation targeting in Turkey.

3.2.1. The Country Risk Relation Literature

There is a large number of empirical works about the determinants of country risk in the literature especially for EMs. Within this deep pool some of the literature have investigated the domestic factors and the others have looked over the external factors

which are above the control of countries own policies. Edwards (1984, 1986) finds out a positive and significant relation between the country risks measured by EM spreads and the ratio of public and publicly guaranteed external debt to GNP, while found an insignificant relation between government expenditure over GNP. In Dell' Ariccia *et al.* (2002), fiscal balances negatively and significantly affect the EMBI Global index in EMs in the period before and after the 1998 Russian crisis. In addition, Ferrucci (2003) indicates that the EMs sovereign spread is significantly affected by the ratio of fiscal balance to GDP, maturity of the debt, risk-free interest rate. Moreover, Zoli (2004) found a positive relation between EMs' public and publicly guaranteed external debt and spreads with a nonlinear model. In Favero and Giavazzi (2004), primary deficits above the critical value (that keeps debt to GDP level constant) influence the EMBI spread of Brazil significantly during 2002. Blanchard (2004) founds a positive relation between Brazil's future debt stock and EMBI spread. Rozata and Levy-Yeyati (2006) document that, contrary to conventional wisdom, credit ratings respond to spreads more than they influence them, raise doubt on their informational content, they have pointed out that ratings provide, at best, only a partial account of the actual likelihood of default of individual countries. Arora and Cerisol (2001) explores empirically in eleven emerging market countries that how country risk is influenced by U.S. monetary policy, country-specific fundamentals, and conditions in global capital markets and find out that in addition to domestic factors, importantly interest rate spreads have tended to move in the same direction with U.S. interest rates changes. However, Calvo (1993, 2002) argues that the domestic macroeconomic factors appear to be meaningless in explaining the EMBI spreads when the U.S. corporate spreads are taken into account thus he implies that is the risk appetite of the foreign investors appears to be the most important determinant of EMBI spreads and additionally, the spreads are highly responsive to political news. Herrera and Perry (2002) take in to account US monetary policy and US corporate bond spreads in short-run and long-run and their estimation also supports that the international factors are important for country risk. Furthermore, Rozada and Levy-Yeyati (2006) find out that the causes of variation in emerging market spreads are most probably due to the exogenous changes in global risk appetite (proxied by high-yield spreads in developed markets)

and global liquidity (proxied by US Treasury notes, 10-year constant maturity yield). The reason is that these influence the international cost of capital, thus debt sustainability and then emerging market spreads. They concludes that these two exogenous factors explain around 30 percent of the long-run variability of emerging market spreads and between 15 and 23 percent of the short-run variability using weekly and monthly data, so besides improving macro fundamentals, emerging economies need to take into account their exposure to global factors and to generate mechanisms to reduce that exposure. On the contrary, Kamin and von Kleist (1999) could not find a significant and robust relation between developed country interest rates and spreads of emerging markets during 1990s but concludes that domestic macroeconomic fundamentals proxied by sovereign credit ratings had an impressive affect on the determination of spreads. In addition, Cline and Barnes (1997) underline the fact that the relation between bonds spreads of eleven emerging markets and US interest rates statistically insignificant for the period analyzed (1992-1996). In addition, Arora and Cerisol (2001: 485) also note that:

> "Even US monetary policy has significant positive effects on spreads, a significant proportion of fluctuations in emerging market spreads is driven by country-specific fundamentals. In fact, their results suggest that improved macroeconomic fundamentals, such as higher net foreign assets (in terms of GDP or imports), lower fiscal deficits, and lower ratios of debt service to exports and debt to GDP, help to lower sovereign spreads. Country-specific macroeconomic fundamentals, such as a sound and sustainable fiscal policy and low indebtedness, are extremely important in reducing country risk and domestic interest rates, factors that are highly conducive to fostering sustainable economic growth."

Hilscher and Nosbusch (2004) find out that EMBI spreads were both determined by domestic and international factors such that by debt to GDP ratio and risk appetite of foreigners over the 28 countries (which are going to be analyzed in Turkey in this thesis). Çulha *et al.* (2006) point out that according to the long-run estimation results using daily data, risk of international investors is the most important common determinant of spreads of twenty-one emerging countries between 1994 and 2004. In addition, the sovereign ratings public debt, fiscal balance, net foreign assets and

exports to GDP have significant impacts. The short-run results were similar with long run except the federal fund rate which is significant in long run. Çulha et al (2006) also analyzed the Turkey spread and found out that between May, 2001 and December, 2004 international factors are estimated to be insignificant such that the Federal target rate is incorrectly signed and insignificant, while the change in risk appetite of foreign investors (as measured by the US corporate bond spread) is correctly signed but insignificant. On the other hand, the sovereign ratings of Turkey indicating the domestic factors seem to be an important determinant of spreads. They importantly argued that domestic fundamentals are basically the indicators of current stance of macroeconomic policies, however the vital thing for he investors is whether the economic policy will change and if it is in which direction. For that reason, Çulha *et al*. (2006) used the variables of news releases which provide information to investors about the intentions of policymakers on spreads which is founded highly significantly and correctly signed. Emir *et al.* (2005) investigates the effects of news about domestic macroeconomic developments, political, EU and IMF related news and rating changes on interest rates through risk premium in Turkey. They indicate that Turkey secondary market interest rates were affected both by good and bad news while the variance of interest rates was affected mainly by bad news releases. Moreover, it is found that in the same period changes in US interest rates and risk appetite of investors did not influence Turkish interest rates through risk premium.

CHAPTER 4

EMPIRICAL RESULTS

In the preceding chapters, we already discussed the links through which the real exchange rate is affected from domestic and foreign interest rates and country risk. We stressed the importance the portfolio choices of investors and thus capital flows for real exchange rate. In addition, the country risk relation and its determinants were discussed. In this chapter, the models of capital flow and country risk relation presented in the previous chapters are estimated for the Turkish data. The capital flow relation estimation sample covers the IT regime from May, 2001 to December 2006. For the country risk model, on the other hand, the sample period starts from August 1999[15] enabling us to investigate dynamics more effectively. The following subsections present the data and empirical results. The last subsection is devoted to the interpretation of the empirical results[16].

4.1. Estimation of the Capital Flow Relation Model

The Data

The capital flow relation is estimated in the form of Model 2. The model is estimated by using two different data sets. The difference comes from the domestic real interest

[15] It was the date that Turkish EMBI spread has started to be calculated.

[16] All the regressions in this study are estimated using E-views 5.0 program.

rates. In the first one, the domestic real interest rate (REINT) is constructed by converting ISE benchmark monthly average interest rates to real by using CBRT's forecasts for inflation over the next 12 months. On the other hand, in the second model monthly average of Central Bank overnight rate (O_N) is used. The reasons behind the second estimation are; first to check robustness and the second to make data set coherent with foreign interest rate since the US Federal Fund policy interest rate (FFR) data gathered from Federal Reserve are preferred as the return of risk free foreign asset by assuming that inflation in US is at low levels. In addition, for the country risk premium, EMBI (calculated by taking monthly averages of daily data from Treasuries of J.P. Morgan) which is the difference between the rate of return on Turkish dollar-denominated and U.S. dollar-denominated government bonds of the same maturity is used as a proxy. Lastly, monthly data of the real effective exchange rate (REEXCH) that is constructed by CBRT is used as the dependent variable. In the estimation all variables are used in logarithm and have a monthly frequency.

Empirical Results

We first estimate the conventional long-run capital flow relation in order to discuss the importance of the fiscal dominance for the IT period of the post May 2001. We consider the following generic equation:

$$(2) \qquad log\,(e) = \alpha_1 + \alpha_2\, log\,(r) + \alpha_3 log\,(r^*) + \alpha_3\, log\,(p\emptyset^*) + \varepsilon$$

The estimated equations are defined as:

$$(2a) \qquad reer = \alpha_1 + \alpha_2 r1 + \alpha_3 r^* + \alpha_4 embi + \varepsilon$$

$$(2b) \qquad reer = \beta_1 + \beta_2 r2 + \beta_3 r^* + \beta_4 embi + \varepsilon'$$

where, reer = log(REEXCH), r1 = log (1 + REINT/100), r* = log (1 + FFR/100), embi = log (EMBI), r2 = log (1 + O_N/100).

We consider Engle-Granger two step cointegration procedure (Engle and Granger, 1987) to test whether the equation can be interpreted to represent a long run equilibrium relationship. To this end, we first investigate the integration properties of the data by employing Augmented Dikey-Fuller (ADF) tests. Table 2 reports the results of the ADF tests. The lag lengths of the ADF test equations are chosen by the Schwarz Information Criterion. .

Table 2: The ADF Test Results of Capital Flow Relation Variables

	Levels			**First Differences**		
Series	λ_n	λ_c	λ_t	λ_n	λ_c	λ_t
reer	0.84 (2)	-1.73 (2)	-4.16*(1)	-7.77*(1)	-7.82*(1)	-7.79*(1)
r1	-1.11 (0)	-2.67 (3)	-3.31 (3)	-4.75*(3)	-4.76*(3)	-4.78*(3)
r2	3.96* (1)	-2.47 (1)	0.36 (1)	-7.39*(0)	-8.34*(0)	-9.19*(0)
r*	-0.65 (1)	- 1.32 (1)	-0.76 (1)	-4.09*(0)	-4.07*(0)	-4.30*(0)
embi	-0.75(1)	-1.08 (1)	-2.12 (1)	-7.08*(0)	-7.08*(0)	-7:09*(0)

Notes: The equations for λ_c include a constant term, and for λ_t a linear trend and a constant term while for λ_n include neither of them. The values with "*" indicate that the null hypothesis of nonstationarity is rejected at the 5% level. The numbers in parentheses are the lags used in the ADF regressions.

According to the ADF test results, all variables are nonstationary at levels, except the overnight rate (r2) and real exchange rate (reer). But, overnight rate is stationary only when constant and trend terms are excluded and the real exchange rate is stationary only when both the trend and constant terms are included in the equations. However, all variables are nonstationary when the ADF test equations contain only the constant term. The first differences of all the variables appear to be stationary. Consequently, each of the variables can be interpreted as integrated of order 1 (I(1)) and thus the validity of the application of the Engle-Granger procedure is not precluded.

Table 3: The Estimation Results of the Capital Flow Relation:

Equation	r1	r*	embi	r2	DW	R^2
2a	-0.37 (0.31)	-1.51 (0.73)*	-0.22 (0.04)*		0.32	0.83
2b		-1.62 (0.70)*	-0.22 (0.04)*	-0.20 (0.17)	0.33	0.83
Notes: The dependent variables is embi. The number of observations is 68. DW is Durbin-Watson statistics. "*" indicates the statistical significance at the 1 % level.						

Table 3 reports the OLS estimation results for equations (2a) and (2b). Table 4 reports the results of the Engle-Granger cointegration tests for the residuals of the estimated equations (2a) and (2b). According to Engle-Granger cointegration test results, the residuals from the estimations of the two models, with different specifications of real domestic interest rates, found to be stationary (Table 4). Thus, it could be concluded that the variables are cointegrated; there is a long run equilibrium relation among the variables estimated in the models. According to the capital flow relation, there is expected to be a positive relation between domestic real interest rate and the real exchange rate. However, the results from (2a) suggests a negative but statistically insignificant coefficient for the domestic interest rate variable when it is defined as the benchmark rate. The coefficient of the foreign interest rate (the US Federal Funds Rate) variable is significant and correctly signed with value -1.51. As the US interest rate increases, capital outflows from Turkey leading to a real exchange rate depreciation. EMBI seems to be significantly important in determining the Turkish real exchange rate and correctly signed such that in Turkey when country risk increases, the real exchange rate depreciates as a result of capital outflows. Figure 6 plots the time series of EMBI and the real exchange rate. The figure clearly supports the presence of a negative relationship between the variables. In equation (2b), the overnight rate is used for domestic interest rate and the estimation results are similar with the first specification (2a). The coefficient of Federal Fund Rate is -0.20 and the coefficient of EMBI is -0.22, both of them are significant and correctly signed whilst the coefficient of overnight rate is insignificant and incorrectly signed.

Table 4: The Engle-Granger Cointegration Test Results

	Levels		
Series	λ_n	λ_c	λ_t
ADF (Model 2a)	-3.90* (1)	-3.87* (1)	-3.87* (1)
ADF (Model 2b)	-4.04* (1)	-4.01* (1)	-3.98* (1)

[a] The equations for λ_c include a constant term, and for λ_t a linear trend and a constant term while for λ_n include neither of them. The values with "*" indicate that H_o is rejected at the 5% confidence level that is series are stationary. The numbers in parentheses are the lags used in the ADF regressions.

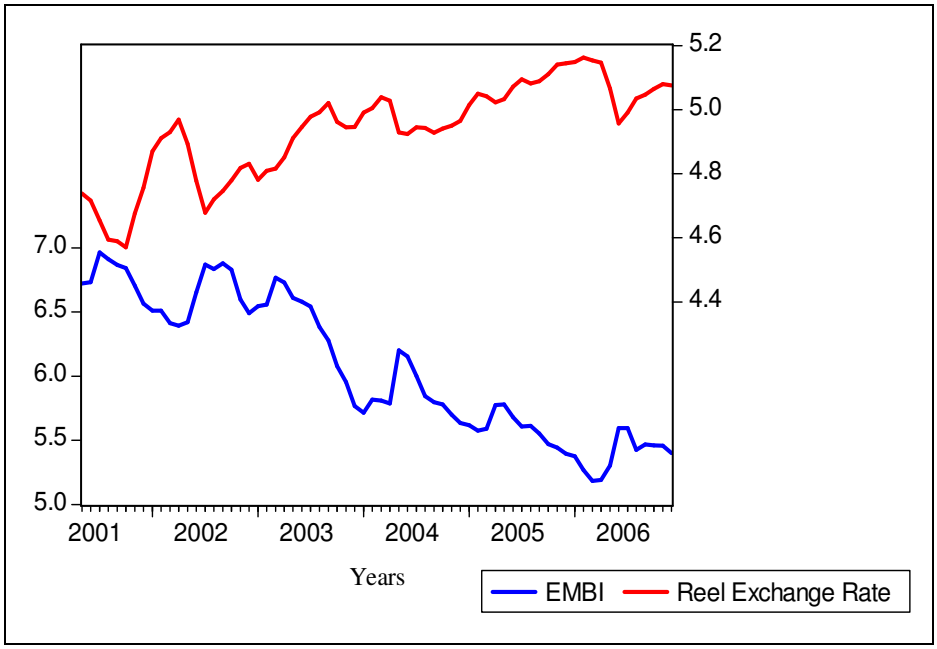


Figure 6: The Relation between the embi and reer (2001:5-2006:12)

4.2. Estimation of the Country Risk Equation

The Data

In the model of country risk relation, again EMBI spread is used as a proxy for the country risk premium. In addition, for the risk aversion of foreigners three different

proxies are used to check robustness: BBB Spread, High Yield Index (HY) and Volatility Index (VIX).[17] The BBB spread is calculated by taking the difference between the yield on U.S. ten-years maturity corporate bonds rated BBB and that on U.S. Treasuries of the same maturity. Calvo (2002), Blanchard (2004), Favero and Giavazzi (2004), Hilscher and Nosbusch (2004) and Çulha (2006) are among the studies using this variable to proxy for the risk appetite of international investors and global liquidity conditions. Following Rozada and Yeyati (2006), we consider two alternative proxies for the risk aversion for robustness. The first proxy is the Credit Swiss First Boston's high yield index (HY), which measures the spread over the US treasuries yield curve at the payment day with the worst yield. We also consider, the VIX (measure of the volatility of S&P 500 index options compiled by the Chicago Board Options Exchange (CBOE)) as a proxy for the (inverse) of foreigners' risk appetite. VIX shows the market's expectation of 30 day volatility, and since volatility often signifies financial turmoil and it is often referred to as the "investor fear gauge". In periods of financial stress accompanied by harsh market declines, option prices and VIX tend to rise. Thus the greater the fear, the higher the VIX level and the opposite happens when market perceptions of the public improves.[18] When HY and VIX are compared, the VIX appears to be a sensible measure of high-frequency changes in risk appetite as disscussed in the literature, whereas HY reflects market perceptions better over the long run. (Rozata and Yeyati, 2006; 13) Apart from these, US Treasury 10-year constant maturity yield (US10) gathered from US Treasury is proxied for international liquidity and Federal Funds Rate (FFR) collected from Federal Reserve is used as a determinant of U.S. monetary policy

For domestic factors as macroeconomic stability indicators, central government real debt stock (D) and consolidated budget balance (BB) data, compiled by the Turkish Treasury, is employed. In fact, generally in the literature, the model is estimated by using these variables as a ratio of output. However, in Turkey monthly GDP/GNP data are not available. Therefore, we consider real variables using the CPI as a

[17] See See Appendix A1.

[18] See http://www.cboe.com/micro/vix/vixwhite.pdf (10.08.2007).

deflator. In addition current account deficit (CAD) in dollars and international gross reserves (RES) are considered as indicators of risk and protection from risk, respectively. Finally, credit rating (RT)[19] variable is obtained from and Standard and Poor's. This variable is also used by Cantor and Packer (1996), Kamin and Kleist (1999), and Eichengreen and Moody (1998) in the country risk equation. The study employs monthly data for the period 1990:8 – 2006:12 and the variables are in logarithm except current account and central government consolidated real budget balance since these variables are often negative.

Empirical results

The country risk models are crucially important for understanding the importance of fiscal dominance for IT. We consider the following generic equation, the derivation of which was already discussed in the earlier sections of this study.

$$(5) \qquad s_t = \alpha_0 + \alpha_1 r_{us,t} + \alpha_2 \emptyset_t^* + \sum_{i=1}^{n} \alpha_i x_{i,t} + \upsilon_t$$

where the equation is estimated by using two different US interest rates ($r_{us,t}$) variables; r** = log (1 + US10/100) and r* = log (1 + FFR / 100), by three different risk aversion proxies ($\emptyset_t^*$); hy = log (HY), vix = log (VIX) and bbb = log (BBB), by five diferent domestic macroeconomic variables ($x_{i,t}$); d =log (D) , BB, CAD, res = log (RES), and rt = log (RT) and by embi=log (EMBI) as a dependent variable.

In the estimation of Model 5, we considered also the US Treasury bonds yield of 10-year maturity and the Federal Funds Rate data. However, the variables were appeared to be insignificant and thus not reported here to save the space[20]. For that

[19] See Appendix B1 and Appendix B2 for details of Turkey's credit rating changes and calculation of data.

[20] See Appendix C1 and C2 for the estimation results of Model 5 with US Treasury bonds yield of 10-year maturity and with Federal Funds Rate.

reason, the model of country risk relation is estimated by excluding the US interest rates variables. That is, we consider the following generic equation:

(5') $$s_t = \alpha_0 + \alpha_1 \ \emptyset_t^* + \ \alpha_2 x_t + \upsilon_t$$

In addition, the estimation has performed by also including domestic factors individually with different proxies for risk aversion of foreigners.

Table 5: The ADF Test Results of Country Risk Relation Variables

	Levels			**First Differences**		
Series	λ_n	λ_c	λ_t	λ_n	λ_c	λ_t
embi	-0.75 (1)	-1.08 (1)	-2.12 (1)	-7.08*(0)	-7.08* (0)	-7:09* (0)
vix	-0.74 (0)	-1.73 (0)	-3.20 (0)	-9.69*(0)	- 9.65* (0)	- 9.66* (0)
hy	-0.11 (1)	- 1.58 (1)	- 2.55 (1)	-6.47*(0)	-6.44* (0)	-6.69* (0)
bbb	-0.87 (1)	-2.12 (1)	-2.60 (1)	-7.38*(0)	-7.35* (0)	-7.42* (0)
d	1.09 (1)	-.29 (1)	-0.69 (1)	-6.89*(0)	-7.02 * (0)	-7.11* (0)
BB	-0.99(12)	-1.62 (12)	-2.63 (12)	-3.53*(11)	-2.53 (11)	-2.70 (11)
rt	0.50 (1)	-1.13 (1)	-1.75 (1)	-6.13* (0)	-6.14* (0)	-6.15* (0)
CAD	3.08 (11)	-0.16 (11)	-2.00 (11)	-2.97*(11)	-9.96*(10)	-9.87*(10)
res	2.65 (0)	1.19 (0)	-1.79 (0)	-8.89*(0)	-9.58* (0)	-8.97* (1)

Notes: The equations for λ_c include a constant term, and for λ_t a linear trend and a constant term while for λ_n include neither of them. The values with "*" indicate that H_o is rejected at the 5% confidence level that is series are stationary. The numbers in parentheses are the lags used in the ADF regressions.

We follow the same methodology in estimating the country risk model equations as for the capital flow estimation presented earlier. We firs investigate the integration orders of the variables by employing ADF tests which are presented by Table 5. The results suggest that all variables are nonstationary at levels. Their first differences, except that of the real consolidated budget balance (BB), are stationary suggesting that their levels can be interpreted as I (1). The first difference of BB is found to be stationary when the ADF equation is defined not to contain a drift (constant and trend) term. Consequently, the levels of all the variables appear to be I (1) suggesting that they can be considered for a cointegration inference.

The results of the country risk models are reported by Table 6. In the equations, ADF report the results of the ADF tests for the null of the nonstationarity of the residuals from the corresponding equations. For robustness, each domestic variable are estimated with three different proxies for risk aversion of foreign investors; VIX, HY and BBB spread. In all of the models, these variables are significant and have positive sign. This means that as these variables increases, the risk aversion of foreigners increases (risk appetite decreases) and then this resulted in an increase in the perceived country risk. Furthermore, when the model is estimated with real debt stock as a domestic variable, all three estimations give the similar and expected results such that real debt stock is positively and significantly related with EMBI spread. In addition, according to Engle-Granger cointegration test, it could be concluded that this relation is also valid in the long run. The second domestic variable included to the model is current account deficit (CAD). Similar to the results of debt variable, the coefficients of the current account deficit variable is significantly positive and the equation represents a long run equilibrium relation. We also consider real consolidated budget balance (BB) as an alternative domestic fragility variable to explain the country risk. The results from the equation containing BB appear not to be satisfactory. In the equations, the coefficients of BB are individually significant but has a negative sign in the equation with HY. Furthermore, the residuals from the equation (Model 5i) with BB and BBB spread are found to be non-stationary. A compact country domestic risk variable can be the credit ratings as it is often taken as a summary measure capturing many domestic fundamentals. Consequently, the results may be more comprehensive. The results from the equations (5j, 5k, 5l) containing country rating (rt) suggest that all the coefficients are significant and consistent with our sign priors. The negative sign of the rt coefficient suggest that, as the credit rating increases, the investor's confidence may be strengthened and then the country risk perception of investors decreases.

Table 6: The Estimation Results of the Country Risk Relation

	5a	5b	5c	5d	5e	5f	5g	5h	5i	5j	5k	5l	5m	5n	5o
vix	1.44 (0.07)*			1.13 (0.08)*			1.28 (0.1)*			0.74 (0.11)*			0.78 (0.12)*		
hy		1.34 (0.05)*			1.15 (0.06)*			1.35 (0.06)*			0.98 (0.09)*			1.08 (0.11)*	
bbb			1.99 (0.17)*			1.35 (0.17)*			1.35 (0.18)*			0.7 (0.13)*			0.52 (0.17)*
BB							-2.08 (2.05)	1.58 (1.54)	-7.86 (2.61)*						
d	0.37 (0.10)*	0.2 (0.07)*	0.58 (0.16)*												
CAD				0.0001 (2.39)*	8.03 (2.02)*	0.0002 (3.03)*									
res													-0.68 (0.12)*	-0.27 (0.12)**	-1.08 (0.11)*
rt										-1.69 (0.25)*	-0.93 (0.23)*	-2.37 (0.2)*			
DW	0.53	0.4	0.17	0.82	0.64	0.47	0.4	0.38	0.22	0.33	0.39	0.30	0.32	0.36	0.22
R^2	0.80	0.89	0.89	0.89	0.93	0.80	0.78	0.88	0.60	0.85	0.90	0.83	0.84	0.89	0.78
ADF	-3.63*[1]	-4.4*[1]	-2.54*[1]	-4.29*[0]	-4.65*[1]	-2.96*[0]	-3.14*[0]	-4.01*[1]	-2.11 [0]	-2.82 [0]	-3.99*[1]	-3.26*[1]	-3.26*[0]	-3.81*[1]	-2.38*[1]

[a] The dependent variable is embi

[b] Numbers in parantheses and brackets are the standard errors and the lags used in the ADF regressions (for the equations without intercept and trend terms), respectively.

[c] The effective number of observation is 89. DW is Durbin-Watson statistics.

[d] "*" and "**" indicate statistical significance of 1 and 5 percent respectively in the first ten columns. "*" in the last column indicates that H_o is rejected at the 5% confidence level that is the equation can be interpreted as representing a long-run equilibrium relationship.

Additionally, apart from the models estimated with VIX, the relation between variables of credit rating and risk appetite is also valid in the long run. The last domestic variable is gross international reserves whose coefficients are found to be statistically significant and negatively signed. In other words, decreases in international reserves can be perceived as the weakening the strength of the economy in the case of domestic or international shocks. For that reason, decrease in gross international reserves will lead to a rise in the country risk premium.

4.3. Implications of the Results

In this section, we estimated two different models, capital flow and country risk equations, both of which enables us to assess the significance of the fiscal dominance in Turkey. The capital flow model is helpful in investigating the effectiveness of monetary authority actions on inflation through exchange rate changes in a highly debted country Turkey. The country risk model, on the other hand, is used not only support the first relation but also to propose solutions to the unconventional results of capital flow relation. With the estimation of capital flows relation, it is found that the Turkish real effective exchange rate is solely determined by foreign real interest rate and country risk premium whilst the domestic real interest has no influence. This has important implications to the economy in the implementation of the IT regime. For instance, if CBRT increases its policy rate substantially when there appears an inflation risk, then the result may be different from the one that can be expected from a conventional monetary policy transmission mechanism. This is because, the results of the model imply that an increase in the policy rate will control the aggregate demand only through changing consumption and investment decisions of economic agents, but the exchange rate channel will not work as in the conventional mechanism since domestic interest rate enters the real exchange rate determination model insignificantly. This proposition is also supported by the estimation of the country risk equation as the debt stock is significant in the equation along with the risk aversion of investors. Furthermore, even the Turkish fiscal stance has improved,

its debt stock level has been still at high levels with large proportion is indexed or denominated in foreign exchange, at variable rate with shorter maturities. As a result, once central bank increases its policy rate in case of a rise in medium term inflation expectations, the public expectations will be affected negatively since fragile structure of debt may trigger the doubts about the sustainability of debt. Then, an increase in the probability of debt repudiation would not only lead investors to demand higher rates to compensate the higher default risk, but also increase the demand for foreign currency denominated assets due to increasing country risk. Hence these facts may resulted in weakening of the domestic currency. As a result, since public perception has changed to 'there are something wrong' with the contribution of weak fiscal stance, a rise in policy rate will lead to pervasive results that these negative expectations about the macroeconomic outlook and depreciation of real exchange rate will contribute to the inflation uptrend. Moreover, the severity of the impact of depreciation depends on the strength of the exchange rate pass through to inflation. Kara *et al*. (2005) analyze this phenomenon in Turkey in the post-2001 period and argue that exchange rate pass through is still important in Turkey even it has weakened after the adaptation of floating exchange rate regime. In other words, they conclude that exchange rate shocks still maintains its dominance over the inflation dynamics, implying that import prices through exchange rate changes are still crucial variables for inflation dynamics. In addition, Tuğer *et al.* (2005) reach similar results and also add that the pass-through, is higher during periods of depreciation which makes the topic of pass-through more important in the context of fiscal dominance.

The country risk equations have also some important implications apart from supporting the fiscal dominance. First, it is found that country risk premium of Turkey is significantly affected by its macroeconomic conditions, that means that, macroeconomic stability is an important indicator for the foreigners investment decision. At first glance, it will be concluded that, improving macroeconomic conditions and strengthening economic outlook will decrease the country risk premium of Turkey and thus decrease the pressure of capital reversals which is an important issue in the agenda of emerging markets. But as Blanchard (2004) stated,

the EMBI spread used in this study as a proxy for country risk reflects not only the probability of default, but also the risk appetite of foreign investors. In addition, also for Turkey the country risk proxy is closely related to the risk aversion proxies[21]. Once the risk aversion of foreigners changes, everything will be reversed even all the things seem to be on their way. As a result it could be concluded that the strength of the macroeconomic parameters are not as effective as expected but on the other hand they will help to decrease the exposure the country confronted in any shock growth out of abroad or domestic. To conclude, the empirical results have addressed the continuing risk of fiscal dominance in Turkey via critical level of debt stock structure and country risk premium. In other words the fragile debt structure leads to excess sensitivity of expectations on economic uncertainties and therefore, diminishes the effectiveness of monetary policies.

[21] See Appendix A2.

CHAPTER 5

CONCLUSION

The Turkish economy, until very recently, experienced severely high and persistent inflation rates, high and potentially unsustainable public sector debt and deficits and a consequent real interest rates. Monetary targeting programmes of the late 1990s were unsuccessful and the exchange rate targeting programme of the 2000 was abandoned in February 2001 with a deep financial crisis. The financial cost of the 2001 crisis was extremely high and the public debt as a per cent of GDP increased sharply mainly due to the rescue program for the banking sector. As discussed by Özatay (2007), the main challenge faced by the monetary authorities in the post-crisis period was the fiscal dominance caused by high public debt along with high exchange rate pass-through, backward looking pricing, and the weak banking sector. At the beginning of the 2002, the CBRT started to implement an "implicit" inflation targeting regime. One of the main challenge of the inflation targeting regime was the fiscal dominance the presence of which might invalidate the conventional monetary policy transmission mechanism in the case of an interest rate increase.

In this study, we focused on an important precondition of inflation targeting and investigate the significance of fiscal dominance for an IT regime in the context of the recent Turkish experience. Under fiscal dominance, an increase in the interest rates may lead to an increase in the concerns about debt sustainability and thus the country risk premium. The consequent capital outflows or sudden stop of capital inflows due to the increase in the probability of debt repudiation can lead to domestic currency to

depreciate instead of appreciate and, under a high exchange rate pass through, interest rate increases can result in the inflation acceleration[22]. To investigate the impact of fiscal dominance we followed mainly Blanchard (2005) and Favero and Giavazzi (2005) and estimated capital flows and country risk models.

The results from the capital flows model based on portfolio approach strongly suggest that the real effective exchange rates in Turkey during the period are determined by foreign interest rates proxied by the US Federal Funds Rates and the EMBI spread. The domestic interest rates are found to be statistically insignificant in the long run real exchange rate equation. An increase in the foreign interest rate or in the EMBI spread both lead to real exchange rate depreciation through capital out flows. As Blanchard (2005) shows, the finding that an increase in the domestic interest rates does not lead to currency appreciation along with the result that suggests the significance of the country risk are both important manifestations of fiscal dominance. The empirical results of this study also provides an explanation to the paradox that why increase in policy rates in July 2001 resulted in depreciation of domestic currency and why CBRT did not prefer to increase interest rates until August 2006 while trying to halting inflation down. The results also lend a strong support to the hypothesis that the risk premium channel dominates the standard portfolio channel in the determination of real exchange rates in Turkey during the period. Consequently, the findings of this study suggest that the relation between risk premium and interest rates through debt dynamics and monetary policy actions may result in a vicious cycle and thus break down the conventional capital flows relation. The results from the country risk models appear to be helpful also in explaining the unconventional findings from the capital flows model. The country risk of Turkey,

[22] The situation under fiscal dominance is neatly summarized by Ersel and Özatay (2007, p.5) "A central bank that raises its policy rate in response to a potential rise in inflation due to weakening of the currency faces two related problems in these conditions. First, a rise in its overnight rate could signal to the markets that "things are not going in the right direction", which could obviously increase the perceived default risk and hence, the real interest rate and exchange rate. Second, both indirectly with the first effect and directly by raising the cost of borrowing, such a response in policy would increase the debt burden of the treasury and jeopardize debt sustainability. The domestic currency would depreciate in these circumstances, which is inflationary if the pass-through effect is significant. This means the plan to increase the short-term interest rate to cope with inflationary pressures would backfire".

proxied by the EMBI spread in the long run is determined by international liquidity conditions (the risk aversion of international financial markets) and domestic variables including real debt stock, real consolidated budget balance, international gross reserves current account deficits and credit ratings.

To conclude, the empirical results have addressed the continuing risk of fiscal dominance in Turkey via critical level of debt stock structure and country risk premium. The fragile debt structure leads to excess sensitivity of expectations on economic uncertainties and therefore, potentially diminishes the effectiveness of monetary policies. The results from the capital flows and country risk equations are found to be important manifestations of the presence fiscal dominance in Turkey. Consequently, contrary to the postulations of the conventional monetary policy transmission mechanism, interest rate increases to cope with inflationary pressures may lead to an inflation acceleration, rather than the reverse.

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APPENDICES

APPENDIX A1

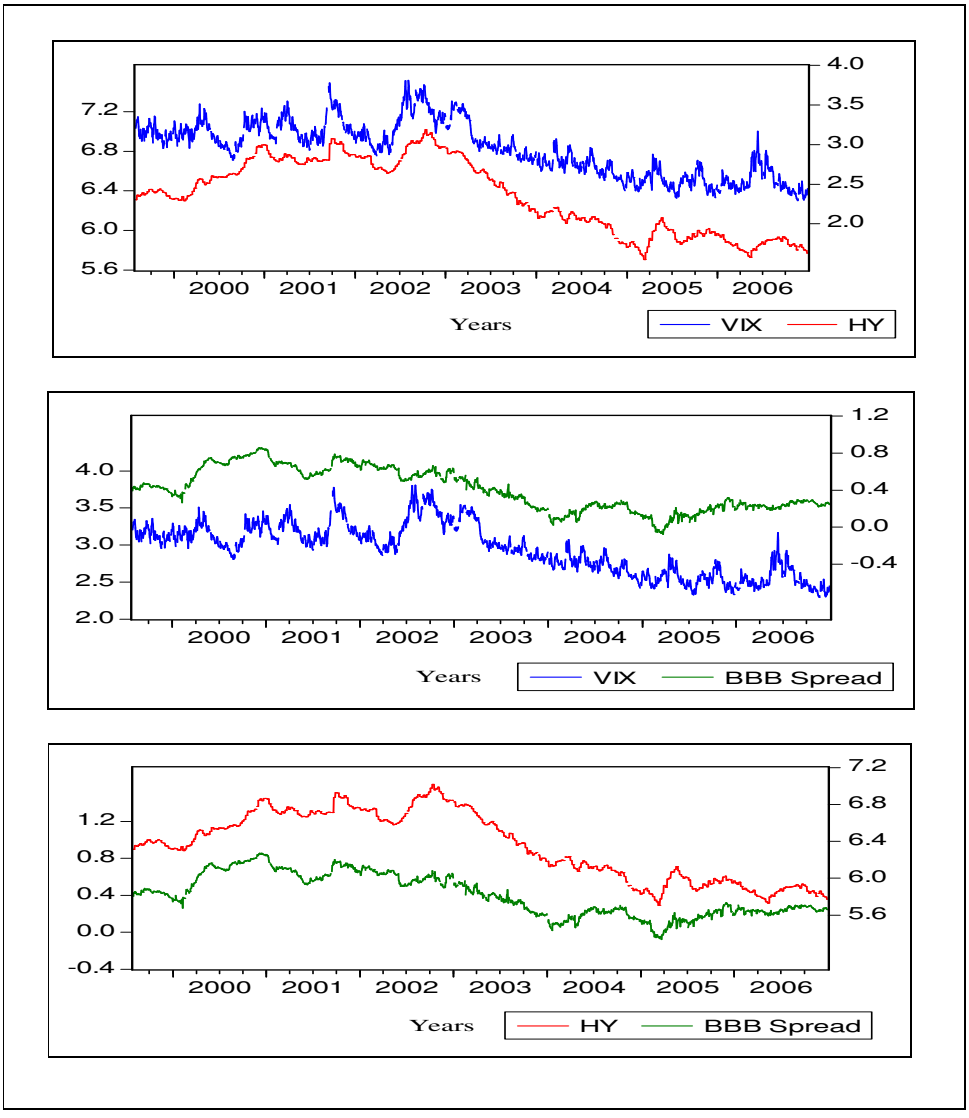

Figure A1: Relations between HY, VIX, Bbb Spread

APPENDIX A2

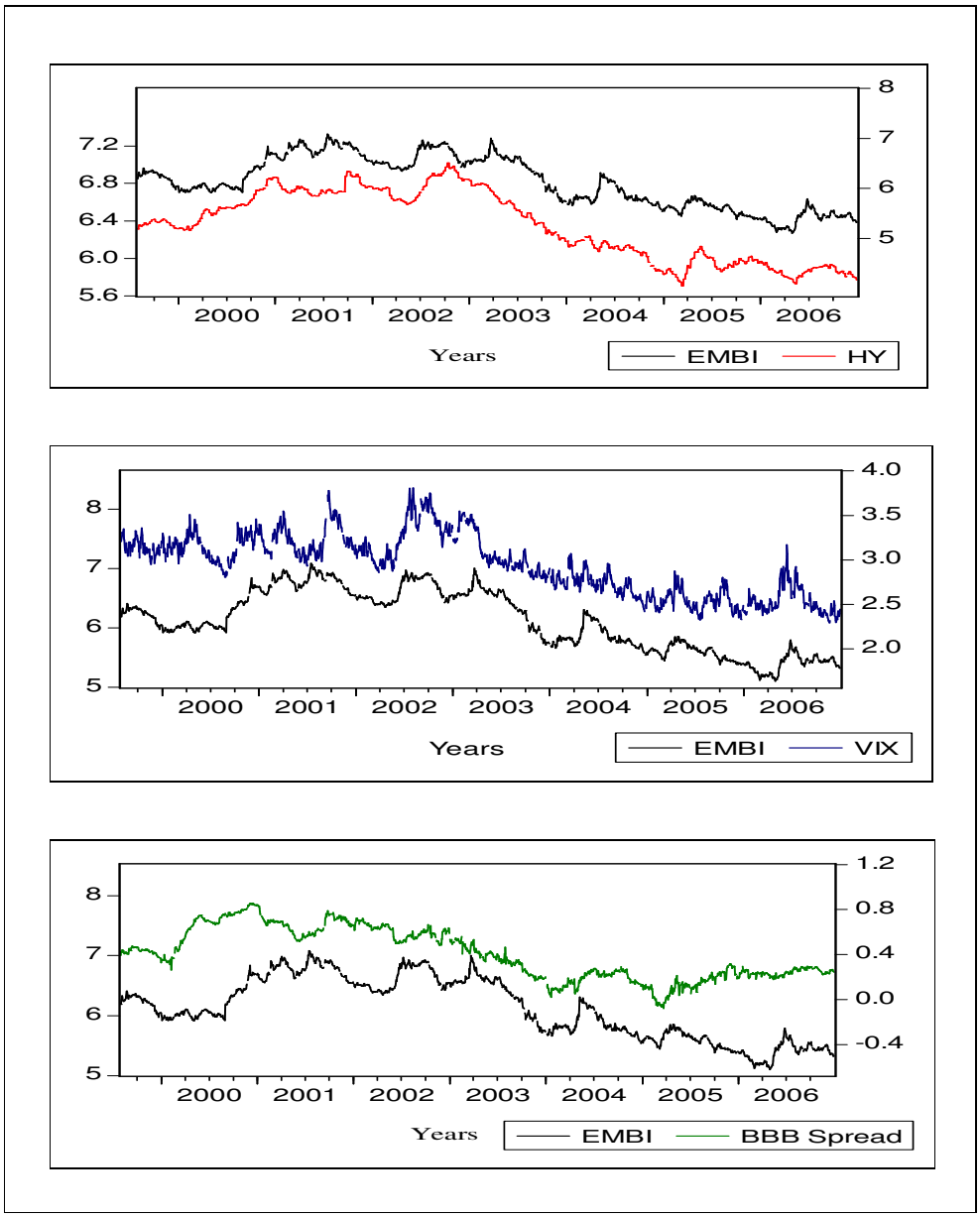

Figure A2 : Relation between EMBI and HY, VIX and BBB Spread

APPENDIX A3

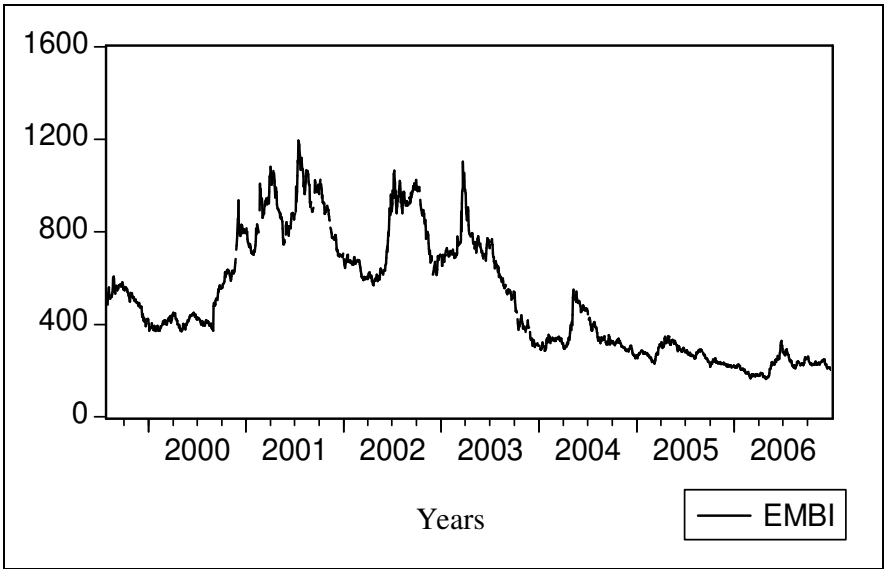

Figure A3: EMBI Spread (1999:07 – 2006:12)

APPENDIX B1

Table B1: Changes in Foreign Currency Credit Rating in Turkey

Date	**Long-term / Outlook / Short-term**
End of 1999	**B / Positive / B**
April 25, 2000	B+ / Positive / B
December 5, 2000	B+ / Stable / B
End of 2000	**B+ / Stable / B**
February 21, 2001	B+ / Watch Neg./ B
February 23, 2001	B / Watch Neg. / C
April 16, 2001	B- / Watch Neg. / C
April 27, 2001	B- / Stable / C
July 11, 2001	B- / Negative / C
November 30, 2001	B- / Stable / C
End of 2001	**B- / Stable / C**
January 29, 2002	B- / Positive / C
June 26, 2002	B- / Stable / C
July 9, 2002	B- / Negative / C
November 7, 2002	B- / Stable / C
End of 2002	**B- / Stable / C**
July 28, 2003	B / Stable / B
October 16, 2003	B+ / Stable / B
End of 2003	**B+ / Stable / B**
March 8, 2004	B+ / Positive / B
August 17, 2004	BB- / Stable / B
End of 2004	**BB- / Stable / B**
End of 2005	**BB- / Stable / B**
Jannuary 23, 2006	BB- / Positive / B
January 27,2006	BB- / Stable / B
End of 2006	**BB- / Stable / B**

Source: Standard & Poors

APPENDIX B2

Table B2: Scoring of Standard & Poors Foreign Currency Credit Rating

S&P	Score	positive	positive watch	stable	negative watch	negative
AAA	22	22,4	22,2	22	21,8	21,6
AA+	21	21,4	21,2	21	20,8	20,6
AA	20	20,4	20,2	20	19,8	19,6
AA-	19	19,4	19,2	19	18,8	18,6
A+	18	18,4	18,2	18	17,8	17,6
A	17	17,4	17,2	17	16,8	16,6
A-	16	16,4	16,2	16	15,8	15,6
BBB+	15	15,4	15,2	15	14,8	14,6
BBB	14	14,4	14,2	14	13,8	13,6
BBB-	13	13,4	13,2	13	12,8	12,6
BB+	12	12,4	12,2	12	11,8	11,6
BB	11	11,4	11,2	11	10,8	10,6
BB-	10	10,4	10,2	10	9,8	9,6
B+	9	9,4	9,2	9	8,8	8,6
B	8	8,4	8,2	8	7,8	7,6
B-	7	7,4	7,2	7	6,8	6,6
CCC+	6	6,4	6,2	6	5,8	5,6
CCC	5	5,4	5,2	5	4,8	4,6
CCC-	4	4,4	4,2	4	3,8	3,6
		0,4	0,2	0	-0,2	-0,4
		0,4	0,2	0	-0,2	-0,4
CC	3	3,4	3,2	3	2,8	2,6
C	2	2,4	2,2	2	1,8	1,6
D	1	1,4	1,2	1	0,8	0,6

Source: www.standardandpoors.com

Note: The outlook could be thougth as a five-notch grading scale around the credit rating: positive, positive watch, stable, negative watch, and negative. In the outlook-augmented ratings Rozada and Yeyati (2006) give each notch a 0.2 value. Thus, if rating variable takes the value 13 for a BBB bond, a BBB with negative watch outlook would take a value of 12.8 and one with negative outlook a value of 12.6

Table C1: Estimation Results of country Risk Relation with Federal Fund Rate, Risk Aversion Proxies and Domestic variables

	I	II	III	IV	V	VI	VII	VII	IX	X	XI	XII	XIII	XIV	XV
vix	1.39 (0.08)*			1.13 (0.09)			0.81 (0.11)*			1.28 (0.09)*			0.76 (0.12)*		
hy		1.31 (0.05)*			1.15 (0.06)*			1.1 (0.10)*			1.34 (0.06)*			1.03 (0.1)*	
bbb			1.92 (0.13)*			1.66 (0.16)*			1.18 (0.19)*			1.91 (1.16)*			-1.03 (0.17)*
r*	-2.40 (2.11)	-1.82 (1.54)	-15.6 (2.04)*	0.15 (1.5)*	-0.15 (1.17)	-9.2 (1.85)*	-3.17 (1.12)**	-3.19 (0.98)*	-9.01 (1.62)*	-4.38 (1.32)*	-2.94 (0.96)*	-12.5 (1.6)*	-0.72 (1.31)	-1.47 (1.06)	-4.53 (1.76)**
BB										-1.62 (1.95)	1.67 (1.47)	-2.18 (2.13)			
d	0.21 (0.17)	0.11 (0.12)	-0.31 (0.17)												
CAD				0.0001 (2.4)	8.0 (2.06)*	0.0001 (2.95)*									
res							-0.64 (0.12)**	-0.22 (0.11)**	-0.67 (0.12)*						
rt													-1.61 (0.29)*	-0.75 (0.27)*	-1.86 (0.27)*
DW	0.51	0.40	0.31	0.82	0.63	0.45	0.36	0.42	0.33	0.45	0.42	0.31	0.34	0.40	0.32
R^2	0.80	0.89	0.77	0.89	0.93	0.85	0.85	0.90	0.84	0.80	0.89	0.76	0.86	0.90	0.84

[a] The dependent variable is log of embi as a proxy for country risk
[b] In each column, number in parantheses denote standard errors and all the models are estimated using constant term.
[c] Included number of observation is 89. DW is Durbin-Watson statistics.
[d] "*" and "**" indicate statistical significance of 1 and 5 percent respectively .

Table C2: Estimation Results of country Risk Relation with US Treasury 10-year maturity Yield, Risk Aversion Proxies and Domestic variables

	i	ii	iii	iv	v	vi	vii	viii	ix	x	xi	xii	xiii	xiv	xv
vix	1.43 (0.07)*			1.13 (0.08)*			0.74 (0.11)*			1.32 (0.09)*			0.82 (0.11)*		
hy		1.34 (0.05)*			1.15 (0.06)*			0.98 (0.1)*			1.35 (0.06)*			1.01 (0.09)*	
bbb			2.03 (0.16)*			1.67 (0.16)*			1.03 (0.13)*			1.74 (0.18)*			0.97 (0.15)*
r**	-3.53 (6.45)	1.58 (4.76)	-28.1 (8.44)*	6.06 (4.85)	1.61 (3.9)*	-26.35 (8.44)*	-15.7 (3.13)*	-11.7 (2.71)*	-28.4 (3.37)*	-11.4 (3.5)*	-5.54 (2.59)**	-24.1 (4.81)*	-6.1 (3.05)*	-4.26 (2.43)*	-11.7 (3.55)*
BB										-2.49 (1.95)	1.14 (1.52)	-6.74 (2.32)*			
d	0.27 (0.2)	0.26 (0.14)	-0.10 (0.25)												
CAD				0.0001 (2.39)*	8.01 (2.04)*	0.0002 (0.25)*									
res							-0.8 (0.11)*	-0.43 (0.11)*	-0.98 (0.08)*						
rt													-1.55 (0.25)*	-0.86 (0.24)*	-2.13 (0.20)*
DW	0.53	0.39	0.25	0.81	0.63	0.57	0.44	0.49	0.51	0.49	0.40	0.33	0.37	0.42	0.35
R^2	0.80	0.89	0.60	0.89	0.93	0.83	0.88	0.91	0.88	0.80	0.89	0.69	0.86	0.90	0.95

[a] The dependent variable is log of embi as a proxy for country risk.
[b] In each column, number in parantheses denote standard errors and all the models are estimated using constant term.
[c] Included number of observation is 89. DW is Durbin-Watson statistics.
[d] "*" and "**" indicate statistical significance of 1 and 5 percent respectively .