



**EXTERNAL VULNERABILITY AND CRISES:
THE ROLE OF CAPITAL FLOWS AND SUDDEN
REVERSALS – THE CASE OF TURKEY**



ECONOMIC RESEARCH FORUM Research Report Series

EXTERNAL VULNERABILITY AND CRISES: THE ROLE OF CAPITAL FLOWS AND SUDDEN REVERSALS – THE CASE OF TURKEY

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PREFACE

Koç University-TÜSİAD Economic Research Forum (ERF) is a research center formed jointly by Koç University and the Turkish Industrialists' and Businessmen's Association. Established in 2004 as a non-profit and non-partisan organization, the Economic Research Forum focuses on promoting independent and objective analysis on economic growth and discusses the implications of different economic policy options.

In today's rapidly changing economic environment, the global economic structure exhibits a rapid transformation. It is crucial to attune with this economic transformation and wisely fill in the gaps emerging from it. The promise of the new economic setting has transformed how agents view economic relations and unlocked a decision-making process to an innovative set of precedence. With the expanding complexity and interdependence and information-rich environment, policy-making for faster economic growth requires new approaches and fine-tuned calibrations based on longitudinal analyses, rather than rough designs. With these ideas in mind, the business and academic community have joined their forces to launch a new forum on economic research in Istanbul.

The report titled "EXTERNAL VULNERABILITY AND CRISES: THE ROLE OF CAPITAL FLOWS AND SUDDEN REVERSALS – THE CASE OF TURKEY" is prepared by Monika Blaszkievicz-Schwartzman and Sumru Öz and published as a part of Economic Research Forum Research Report Series.

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ABSTRACT*

The Turkish economy has had a strong recovery from the global crisis of 2008-2009. During the post-crisis period, increasing short-term capital inflows have been associated with, until mid-2011, an appreciating real exchange rate and credit growth, which have fuelled domestic demand. The resulting surge in imports has led to a sharp widening of the current account deficit such that the current account deficit reached its historical high of around 10 percent of GDP in 2011. Under these circumstances, this report assesses vulnerabilities accumulated in the Turkish economy and the *potential* for a future crisis. The attempt is made to identify existing vulnerabilities and explore linkages between macroeconomic and financial sectors through which a crisis might develop — should one occur.

To this end and in order to provide with some lessons for Turkey, the Report reviews existing models and theories of financial crises. It also assesses the impact of short-term capital inflows on the Turkish economy during the post-capital account liberalization era, including crises episodes. Finally, it examines the behaviour of indicators presented in the literature as useful for monitoring economic vulnerabilities, and conducts a more formal analysis in the form of an early warning exercise. To the authors' knowledge, the Report constitutes the first study of this kind for Turkey. The following main findings and conclusions emerge from the analysis carried out in this Report. The empirical results indicate the existence of vulnerabilities in the Turkish economy. This is manifested by fluctuations in the predicted incidence of a crisis twenty-four months ahead. Furthermore, there is some evidence of exchange market pressure since the beginning of 2011 based on the Eichengreen *et al.* (1996) EMP index. Therefore, it can be suggested that a number of policy changes are needed to correct existing imbalances and to reduce vulnerabilities faced by the Turkish economy. This is because domestic investment, thus economic growth in Turkey relies heavily on capital inflows. The way of maintaining high growth rates without letting the accumulation of unsustainable imbalances, is to increase the share of investment expenditures financed through domestic savings.

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SECTION 1

INTRODUCTION

‘There is no means of avoiding the final collapse of a boom brought about by credit expansion. The alternative is only whether the crisis should come sooner as the result of a voluntary abandonment of further credit expansion, or later as a final and total catastrophe of the currency system involved.’

— Ludwig von Mises

Between 2008 and 2009 Turkey experienced a severe recession, which was triggered by adverse global economic conditions, i.e. so-called subprime mortgage crisis. According to the Organization for Economic Cooperation and Development (OECD), in 2009, Turkish gross domestic product (GDP) contracted close to 14 per cent from peak-to-trough (OECD, 2010). This contraction was mainly driven by a foreign demand shock aggravated internally by a decline in market confidence and structural problems related to declining competitiveness prior to the crisis. It should be stressed, however, that domestic macroeconomic and financial sector conditions were fairly sound at the time of the slump, and that Turkey was one of the countries where gross capital flows grew particularly strongly prior to the crisis (OECD, 2010).

Since then, the recovery of Turkish economy has been impressive. In the first quarter of 2011, output growth reached 11 percent outpacing that of China. Also, post global crisis capital inflows bounced back fairly quickly (already in the second quarter of 2010) and rose rapidly after that. In fact, over the past two years, among other emerging markets (EMs), Turkey had experienced one of the highest waves of capital inflows (other recipients are Asian and Latin American EMs as well as South Africa). Wide interest rate differentials, Turkey’s relatively healthy public- and private-sector balance sheets, the depth of financial development, strong near-term growth prospects, increased political certainty, and the prospect of a possible upgrade to investment status (already materialised) all supported inflows according to the International Monetary Fund (IMF)¹. Furthermore, loose monetary policy in advanced economies (AEs) acted as a strong ‘push’ factor.

Even though capital inflows can help enhance growth rates, and deliver benefits in terms of the international allocation of savings and investment, international risk-sharing and financial development, there is cause for concern in the surge in capital inflows to Turkey, which has been accompanied by a mounting current account deficit and until very recently an appreciating currency (see Section 4). First, in contrast to pre-crisis flows where capital flowing into Turkey was mainly in the form of inter-enterprise loans and direct investment,

¹ IMF Public Information Notice (PIN) No. 11/24.

current flows take the form of short-term portfolio flows intermediated mostly by the domestic banking and non-banking sectors (see Section 3). Should the reasons for these volatile portfolio flows be structural in nature, this is a cause for macroeconomic and financial stability concerns². Second, post-crisis capital inflows to Turkey generated strong upward pressure not only on the exchange rate, but also on domestic demand, as marked by credit growth increases to the private sector (see Section 4 and 5). A private consumption credit boom and other signs of overheating leave the country vulnerable to external shocks (such as increases in interest rates in advanced economies, standstills in capital inflows similar to that observed during the global financial crisis in 2008) and policy reversals (such as fiscal tightening) in the future. Also, as foreign capital continues to flow into Turkey, banks are able to respond to increases in demand and extend even more credit, further overheating the economy. Because of the nature of capital inflows to Turkey, the level of consumer spending puts the country in a position where it could not finance the associated mounting current account deficit should the capital inflow reverse (or should the country experience a sudden stop)³. Third, a rapidly increasing current account deficit highlights the high import content of domestic and external demand, reflecting poor international competitiveness of the domestic business sector. Finally, as emerging economies (EMs) have relatively small markets when compared to advanced economies (AEs), even small changes in portfolio allocation in AEs or negative changes in market confidence in the still frantic (or rather more frantic) post-crisis global environment⁴ can have large consequences for small open economies like Turkey⁵.

This paper assesses vulnerabilities in the Turkish economy since 2010 and the *potential* for a future crisis. The attempt is made to identify existing vulnerabilities and explore linkages between macroeconomic and financial sectors through which a crisis might develop — should one occur. Although Turkey has managed to maintain current account deficit at the levels which are considered unsustainable by the literature on financial crisis (see Section 2 and 4) since 2004, the two major crises that Turkey underwent in 1994 and 2001 were both preceded by high current account deficits. This fact combined with the strong short-term capital inflow, real currency appreciation, a private-sector credit boom, and global financial fragility, raise concerns about Turkey's vulnerability to a crisis. Moreover, the recently observed weakening of the Turkish lira does not only reflect changes in monetary policy

² 2011 Article IV Report (IMF, 2011) suggests that CA deficit in Turkey is indeed structural.

³ In fact, a sudden capital standstill had contributed to the 2001 bust in Turkey (during the global recession, a sudden-stop was prevented in Turkey as a sharp contraction in capital inflows was partially offset by the repatriation of Turkish funds abroad and no significant gap arose in the funding of the current account deficit (OECD, 2010))

⁴ The uncertainty related mainly to a fragile recovery in the AEs and concerns related to debt crises in some of the European countries (Greece, Ireland, Italy, Portugal, and Spain) as well as in the US.

⁵ For example, the 2008-2009 Turkish recession was to a large degree triggered by a foreign demand shock (which was aggravated internally by drops in market confidence and structural problems related to competitiveness prior to the crisis) despite fairly sound domestic macroeconomic and financial sector conditions (2010 OECD report).

aiming to restrain surges in foreign financing and support domestic economy activity, but also is a sign of increased global risk aversion and associated capital flow reversals from emerging markets. Although the capital outflow and depreciating currency are often one of the first signs of a financial crisis, it is very difficult to say whether the Turkish lira will come under speculative pressure in the near future or not, and whether drastic capital reversals will be observed. As past experience in predicting crisis shows, this is a very difficult task (e.g. Berg et al., 1999, Berg and Pattillo, 1999a and 1999b). For this reason, and following a recent approach in the empirical literature (e.g., IMF and FSB 2010 study), the paper does not attempt to predict the timing or trigger of a potential financial crisis in Turkey⁶. Rather, it tries to identify existing vulnerabilities and risks that predispose the Turkish economy to crisis. In doing so, Section 2 discusses various theoretical models of financial crisis in the literature. The overview of the models offers some insights into the roots of previous financial crises as well as potential transmission channels through which a crisis can spread into an economy with some lessons for the Turkish economy. Section 3 briefly describes the three major crises in Turkey since 1989 capital liberalization and it evaluates the trends in capital flows to Turkey, both from a historical and current perspective. Section 4 provides the preliminary analysis of selective leading indicators of financial crises. Section 5 sets out a more formal ‘early warning’ analysis a la Kaminsky, et al. (1998), which flags growing vulnerabilities in the Turkish economy and assesses a *potential* for crisis. Section 6 concludes.

⁶ At this point it should be noted that despite the fact that countries in which nominal exchange rates follow floating exchange rate regimes are less prone to speculative attacks, floating regimes are not crisis-preventive (Razin and Rubinstein, 2006).

SECTION 2

THEORETICAL FRAMEWORKS AND
DEFINITIONS OF FINANCIAL CRISES

‘A financial crisis is a non-linear disruption to financial markets in which adverse selection and moral hazard problems become much worse, so that financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities.’

— Mishkin (1996)

Financial crises are neither a new phenomena nor are they uncommon. Throughout the 1990s they appeared to be a primarily developing economy phenomenon, when countries such as Mexico (1994), Indonesia, Thailand, Malaysia and the Philippines (1997), Russia (1998), Brazil (1998), Argentina (1999) and Turkey (1994, 2001), to name a few, all experienced some type of crisis. However, the recent global financial crisis which erupted in 2008 proved that mature economies are not immune to financial turbulences either.

Despite many similarities between crises, the literature usually differentiates among different types: currency crises, sudden stop crises, banking crises, debt crises and current account reversals (large swings in the current account, from deficit to surplus)⁷. The concept of a sudden-stop crisis, which shall have an important bearing on the analysis in this paper, bares further elaboration. The concept of the sudden-stop was first introduced by Dornbush et al. (1995) and later popularized by Calvo (1998, 2000 and 2002), who describes a sudden stop as an abrupt termination in foreign capital inflows and/or a sharp capital outflow simultaneous with a *currency/balance of payments crisis*. Although Kaminsky (2003) classifies a sudden stop as a type of currency crises, Hutchison and Noy (2006) show that many currency crises occur without sudden stops. In fact they use the term ‘sudden stop’ for those episodes of capital flow reversal that *do not* occur jointly with currency crises and they refer to them as sudden-stop crises. This work, follows Hutchison and Noy’s classification, and also considers a sudden stop as a type of financial crisis (which may be, but does not have to be associated with other types of crises).

Although the current economic conditions in Turkey do not exactly match those that existed in many countries which have experienced financial crisis in the past (including earlier Turkish crises), economists should not overlook the lessons learned from past crises and existing explanatory models. Despite different forces at work in different crises, there are still many similarities between crises. For example, a common feature of the 1997 Southeast Asian and the 2008 subprime crises is the fact that both episodes were preceded

⁷ Some authors do not treat current account reversals as financial crises. In their view, current account reversals can often be smooth reflecting intertemporal consumption smoothing. Although Milesi-Ferretti and Razin (2000) and Adalet and Eichengreen (2005) find that most reversals are benign, in our discussion we focus on those reversals which can be categorized as crisis episodes.

by a sustained surge in capital inflows and economic booms characterised by asset price bubbles, credit booms and deteriorating current accounts. In both cases the crisis was triggered by investor panic in the face of uncertainty over the security and valuation of assets (Khor Hoe Ee and Kee Rui Xiong, 2008). Both crises featured a liquidity run and rising insolvency in the banking system. Even if none of the Southeast Asian countries exercised *de facto* flexible exchange rate systems as was the case in many countries hit by the 2008 crisis, still, the common lesson from both crises is the need to monitor and correct weak elements in the national financial architecture. These weak elements, among others, include inadequate management of surges in capital inflows, the build-up of short-term debt, excessive credit growth (i.e. well beyond what is justified by long-term economic fundamentals), asset pricing bubbles (including both real estate and equity), and currency and maturity mismatches in the financial and/or corporate sectors⁸. Therefore, given the recent imbalances in the Turkish economy (see Section 3, 4 and 5), understanding the genesis of different financial crises in the past is essential. In what follows, theoretical models of financial crises are briefly discussed, with particular emphasis on the link between capital flow surges, macroeconomic instability and crises.

Prior to the eruption of the crisis in Southeast Asia in 1997, the theoretical literature on financial crises used to describe two classical models: so-called *first generation* models (Salant and Henderson, 1978; Krugman, 1979; Flood and Garber, 1984) and *second generation* models (Obstfeld, 1994; Eichengreen, et al. 1996; Krugman, 1996)⁹. Both types of models discuss currency crises occurring in the context of a fixed exchange rate regime. The crisis itself is defined as a sharp change in international reserves due to the government defence of the nominal exchange rate. In particular cases, where the defence fails, the exchange rate peg is abandoned. The canonical models of first generation crises developed in response to the Latin American debt crisis of the 1970s and 1980s, explain a currency crisis in macroeconomic terms by showing how fundamentally inconsistent domestic policies lead an economy to a currency crisis. A typical currency crisis in a country with a fixed exchange rate regime is caused by an excessively large budget deficit, which is inconsistent with the long-term maintenance of the fixed rate and limited stock of foreign exchange reserves. Eventually, international reserves that serve as a buffer between the fixed exchange rate policy and the expansionary domestic policy are driven down to zero and the exchange rate policy has to be abandoned.

Second generation models were developed after the ERM (European Exchange Rate Mechanism) crisis in 1992 and Mexican crisis of 1994. In contrast to first generation models, here governments are more rational and try to condition fiscal policy on the balance of payments, calculating costs and benefits of retaining the peg. As long as the fundamentals

⁸ Note that asset price bubbles can be brought by credit bubbles.

⁹ A more detailed survey of financial crises' models can be found in Blazskiewicz (2000).

are strong, a crisis will not occur. It can only happen when they are extremely weak. Self-fulfilling expectations and multiple equilibria play an important role in these models since a crisis may also develop without changes in economic fundamentals. As in Krugman (1996), Obstfeld (1994) emphasises that a fixed rate will be costly to defend if people expected in the past that it would depreciate now¹⁰.

After the 1997 Asian crisis ‘third generation models’ emerged (Corsetti, et al., 1998, Krugman, 1999, Chang and Velasco, 1999, Aghion, et al., 2001 or Dornbusch, 2001). These models are more eclectic when compared with the first two generations of ‘financial crisis models’. Although, East Asian countries did not have *de facto* floating exchange rate regimes, it should be stressed that in ‘third generation models’ a crisis can happen irrespective of the exchange rate regime. (In the context of a flexible exchange rate, currency crisis is defined as a sharp change or correction in the nominal exchange rate). Third generation models typically emphasise the role of weak fundamentals in precipitating a financial crisis. Corsetti, et al. (1998) focus on a moral hazard problem originating from asymmetric information¹¹, where implicit and explicit government guarantees to failing banks imposed a large fiscal burden on the government. In general, moral hazard includes a situation where some borrowers believe that they are exempt from future punishment. In Asia, for example, weakly regulated private financial institutions had a strong incentive to engage in excessively risky investments. During the recent global crisis, as in Asia, investors and banks also suffered from moral hazard, investing in long-term, complex structured financial products using short-term funds, on the assumption that reinvestment would always be possible. The perception was that ‘this time is different’ (Reinhart and Rogoff, 2008), a situation in which economic agents convince themselves that new financial instruments have eliminated traditional sources of risk.

It should be stressed that unlike the first generation models, which look at *flow* variables (such as current account or fiscal balance), third generation models also examine *stock* variables, i.e. they tend to take a balance sheet approach to financial crisis¹². In this approach a crisis is defined as the situation in which demand for financial assets of one or more sectors of the economy plummets. This may happen because creditors lose confidence in a country’s ability to service external debt, and/or in the government’s ability to service its debt, and/or in the banking system’s ability to meet deposit outflows, and/or in corporations’

¹⁰ For example, labour unions might demand higher wages which would leave the country’s industry uncompetitive at the given exchange rate. In this situation, concerns about devaluation become a self-fulfilling prophecy.

¹¹ The other problem refers to adverse selection. This is a situation, where it becomes virtually impossible to ‘screen’ properly a quality of the loan demander. Because this is usually a high-risk firm, which seeks for loans, in result, many profitable projects are not undertaken. For details see Mishkin, 1996.

¹² Because of the possibility of multiple equilibria in many of the second generation models, they can be seen as stressing one element of balance sheet vulnerabilities. For instance, liquidity mismatches, either in the government sector or in the private sector, can lead to a self-fulfilling currency run or debt rollover crisis or banking run crisis (Allen et al. 2002).

ability to repay bank loans and other debt. In such situation, an entire sector may be unable to attract new financing or roll-over existing short-term liabilities. It then must either find other resources to pay off its debts (such as official loans from international organisations) or seek a restructuring. The loss in investors' confidence is usually reflected in a significant capital outflow, a sharp depreciation/devaluation of the exchange rate, a current account reversal, and a deep recession (Allan et al., 2002).

An example of the balance sheet approach to financial crisis can be found in Krugman (1999). He modifies his first generation model to include the role of corporate balance sheets in influencing investments as well as the role of capital flows in affecting the real exchange rate. The model points to the role of weak corporate balance sheets in the presence of under-regulated financial intermediaries and overpriced assets. In the model investors lose confidence as a country experiences a large real depreciation. What is important in Krugman's model, but is also stressed by others (e.g. Aghion et al., 2001), is the balance sheet imbalances derived from currency mismatches. A currency mismatch (e.g. a situation in which foreign currency denominated liabilities exceed assets denominated in local currency) limits the ability to convert domestic currency into foreign currency. Then, in the onset of the crisis, when the exchange rate starts to depreciate, firms' net worth deteriorates. As the firm's risk increases, credit becomes more expensive and more restricted, which finally affects investment and therefore, aggregate demand¹³. A currency crisis can be triggered by a fundamental shock or can be self-fulfilling¹⁴ (e.g. in Burnside et al., 2004, government guarantees lead to the possibility of self-fulfilling speculative attacks).

Mishkin (1999) also uses a balance sheet approach to explain how problems in the banking sector can lead to a financial crisis in emerging market countries like those in East Asia. On the one hand, the deterioration in the balance sheets of banking institutions can lead them to restrict their lending in order to improve their capital ratios or can even lead to a full-scale banking crisis which forces many banks into insolvency. In this case the ability of the banking sector to make loans vanishes. On the other hand, the deterioration in bank balance sheets can trigger a currency crisis because it becomes very difficult for a central bank to defend its currency against a speculative attack. When the central bank raises interest rates in order to defend the domestic currency, it puts an additional pressure on the banking system. This happens because of the maturity mismatch (banks are usually borrowing short and lending long) and banks' exposure to credit risk whenever the economy becomes fragile and vulnerable. Weak banking systems increase speculative incentives to attack the currency. An attack can be triggered by many factors, one of which is a large current account deficit. Moreover, as Mishkin (1996) points out, similar to the situation in the corporate sector, if devaluation occurs, the position of banks can be

¹³ Note that asset price bubbles can be brought by credit bubbles.

¹⁴ A more detailed survey of financial crises' models can be found in Blazskiewicz (2000).

weakened further if a large share of their liabilities is denominated in a foreign currency. The proportion of non-performing bank loans increases, raising the concern about the fundamental soundness of the banking sector, which in turn further undermines investor confidence. From the asset side, the banks' balance sheet may worsen because households may be unable to pay off their debt.

Unlike the first and the second generation models, the models developed in the post Asian crisis era often stress the role of sharp movements in the capital account as opposed to the current account. According to the 'capital account crisis' theoretical framework, it is a capital account surplus which drives a current account deficit. A deteriorating current account prior to the crisis is to a large extent the result of the excessive capital inflows and therefore cannot be the causative factor in the crisis. The chronology of this type of crisis goes as follows: From the external side, there is an excessive net capital inflow, which exceeds the underlying current account deficit, resulting in overall balance of payments surplus. The probability of the crisis increases together with the composition of this inflow, which is in large portion short-term and denominated in foreign currency. When capital inflows continue, the excess capacity (overproduction) of the economy causes an asset price bubbles in stock and real estate markets. Then doubts about sustainability of the accelerating current account deficit given the underlying fundamentals arise. Finally the bubble bursts. The capital reversal results in a balance of payments deficit, given the increased current account deficit; foreign reserves are exhausted and the fixed exchange rate is abandoned. Internally, a banking crisis is accompanied by a credit contraction. As the exchange rate depreciates, the balance sheets of financial institution with unhedged foreign-currency debt are seriously damaged. 'Twin crises' (both banking and currency crises) reinforce each other through the balance sheet effect described above. The effects on the real economy are devastating (Yoshitoni and Ohno, 1999).

Another variation of the third generation model entails a capital account crisis associated with a sudden standstill in a foreign capital inflow, i.e. a sudden stop. The defining characteristic of a sudden stop is that it has to be large and *unexpected* (Calvo and Reinhart, 2000). Although a crisis country may be vulnerable to a sudden stop, the term sudden stop suggests that the standstill in capital flows may not be related to any fundamental problem in a crisis country. Sudden stops, among others, may result from contagion, changing global market conditions (such as decreases in investors' appetite for risk) or changes in AE's interest rates. Yet, given that sudden stops are usually associated with significant cuts in current account deficits, a widening current account deficit is one of the less desirable macroeconomic effects of large capital inflows to a recipient country. Good examples of financial crises that fall into a sudden stop category are crashes in Latin America (e.g. Argentina, Brazil, Chile, Colombia, Mexico, Peru, and Venezuela) that took place in the aftermath the 1998

Russian crisis¹⁵. Calvo et al. (2002) argues that since massive capital inflows to the region in the early 1990s reversed suddenly and in a synchronized manner, they can hardly be explained by traditional models of financial crises. Discussing the example of Argentina, they claim that the stop in capital flow to a heavily liability-dollarized economy, together with a massive increase in the real exchange rate, significantly worsened the governments' fiscal position and led to a default. Although, Argentina was pre-disposed to a sudden-stop¹⁶, in the authors view, a sudden-stop played a bigger role in triggering the crisis than the role played by fiscal imbalance *per se*¹⁷.

Sudden stops, like other financial crises may have recessional consequences for the economy. This is because an abrupt stop or even reversal in foreign capital inflows in conjunction with a realignment of the exchange rate and corrections in asset prices may cause a sharp drop in domestic investment, production and employment. As the capital inflow slows down or reverses, unexpected swings in relative prices and costly bankruptcies (or attempts to stop them) can lead the country into insolvency or considerably lower the productivity levels of the existing capital stock (Calvo et al., 2002). They may also destroy credit channels, making it difficult to recover from output losses. The consequences of sudden stops are especially severe when the CA deficit is financed by short-term debt, as liquidity shocks are greater in this case. Also, since excessive private consumption and government expenditures tend to adjust drastically when foreign capital slow, the lack of access to world capital markets during bad times can impede governments' ability to implement counter-cyclical fiscal policies (Kaminsky, Reinhart and Vegh, 2004; Reinhart and Reinhart, 2008).

As in Krugman's 1999 model, sudden stops are *independent* of nominal exchange rate arrangements. This is because sudden stops are shocks to credit and as such generate real long-run effects for the economy irrespective of the exchange rate regime. Calvo et al. (2002) argue that even if the nominal exchange rate had been allowed to float freely in Argentina, the crisis could not have been prevented. This is because Argentina was highly vulnerable to considerable changes in the *real* exchange rate following a sudden stop. Real exchange rate volatility, in turn, had harmful effects on corporate balance sheets and fiscal sustainability, which could not have been avoided even if the exchange rate was allowed to float.

¹⁵ Notice that Turkey also experienced a sudden stop in 2001.

¹⁶ Argentina was very vulnerable to an unexpected standstill in capital inflows due to the fact that it was extremely closed to international trade (C), highly indebted (D), and had large financial currency mismatches (M). The economy characterised by these features is referred to by Calvo et al. as a CDM economy.

¹⁷ In general, in the third generation models, even though fiscal deficit can facilitate currency crisis, unlike in the first- and second-generation models, deterioration in fiscal balances may lead to a crisis primarily through its impact on private firms' balance sheets (and not through money printing as it is the case in the previous models).

The following main points emerge from the above overview of currency crisis models and theories. First, although the mechanisms that lead to crises may differ from crisis to crisis, the particular choice of exchange rate regime is not crisis preventive, as the 2008 global crisis or the recent European debt crisis showed. Therefore, the fact that Turkey adopted a floating exchange rate system in 2001 cannot be considered an insurance against future financial crashes (this was also confirmed during the 2008 crisis). Second, various models of financial crises can still carry important (even if sometimes basic) policy lessons. For example, as the current Greek crisis shows, the lessons of Krugman's model – that unsustainable fiscal policy eventually lead to financial disruption and crisis – holds. Third, since financial crisis can happen in economies with fairly balanced fiscal policies, as second-generation models point out, strong economic fundamentals are crucial to avoid crashes. This is an important message for the Turkish economy, and runs counter to the commonly held assumption that a relatively prudent fiscal stance in Turkey is enough to act as a crisis buffer. If the market shifts expectations from one equilibrium to another, a sudden stop may be observed and Turkey may find it difficult to finance its large current account deficit. To minimize the risk of shifts in expectations, reduction in imbalances is required. Fourth, as third generation models stress, the integration of global financial integration gives rise to 'new' fundamentals as a cause for financial turmoil. The 1997 Asian crisis together with the 2008 global crisis confirm that financial crises can occur not only when macroeconomic but also microeconomic/ financial indicators point to vulnerabilities. In integrating into global markets, small and open economies become especially vulnerable to external and internal shocks. Since the beneficial role of capital flows to developing countries is undeniable, a combination of sound macroeconomic policies and a strong balance sheet position of the financial, banking as well as corporate sectors are essential prerequisites to avoid financial crises.

SECTION 3

INTERACTIONS BETWEEN BALANCE OF
PAYMENTS PROBLEMS & CAPITAL FLOWS

In this section, an analysis of the balance of payments problems for Turkey is carried out and specifically the behaviour of the financial account of the balance of payments and its components is examined. The movements in the balance of payments and the structure of capital flows is specifically analyzed in this section because large scale capital outflows have typically been coupled with crises that Turkey suffered in the post-capital account liberalization period, i.e., after 1989. Moreover, as Reinhart and Reinhart (2008) document, sharp adjustments in current and financial accounts are usually preceded by a sustained surge in capital inflows – the so-called capital inflow bonanza. They further find that inflow surges are associated with a higher number of banking, currency, debt default and inflation crises both in advanced and emerging economies¹⁸. Indeed, also Calvo *et al.* (1994), point out that excessive capital flows, especially those associated with the search for higher yields can cause a disruption in the financial system or serious macroeconomic imbalances. This raises concerns given that, along with other emerging economies, Turkey has been experiencing an influx of short-term capital flows, mainly in the form of debt securities in the post global crisis era.

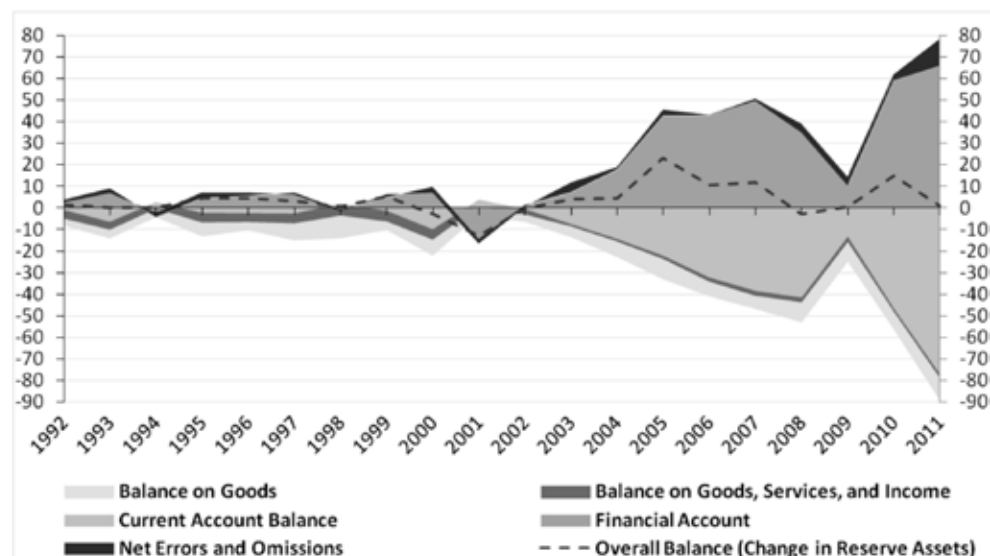
The detailed analysis of developments in Turkish balance of payments conducted below adds to the discussion in the report by showing how capital flows have evolved in Turkey in the post-1989 period as well as how they behaved in three separate crises. In the body of the text, a more formal evaluation of indicators which exhibit an unusual behaviour prior to a crisis is presented as well as a *potential* for crisis in recent months is discussed.

3.1 Major crises episodes in Turkey and trends in capital flows

The literature has documented three important episodes of financial crises in Turkey since 1989 when the capital account was liberalized: the banking and financial crises of 1994 and 2000-2001 as well as the global financial crisis of 2008-2009. As Figure 3.1 shows, during the first two crisis episodes, there was a reversal in the overall balance implying a reduction in reserve assets of the Central Bank and a need for external financial assistance. In contrast, during the global crisis of 2008-09, there was no balance of payments problem requiring an immediate IMF assistance (Onis, 2010), the reversal in the overall balance was minor, and the financial account did not turn negative, i.e. capital outflow was not observed.

¹⁸ In more than 60 percent of countries the probability of crisis around the dates of heavy capital inflows was higher than for the entire sample considered.

**Figure 3.1 Main Components of Turkey's Balance of Payments
(\$ billions)**



Source: Balance of Payments Statistics, Central Bank of Turkey

In order to understand the logic behind the crisis which erupted in 1994, it is necessary to revert to the post-1980 period in Turkey. During this time, under the government headed by Turgut Ozal, the economy embarked on the program of trade and financial liberalization. The Ozal government also initiated an ambitious program of infrastructure investment. As a result, the share of government expenditures in GDP increased, which together with transfer payments prior to general elections led to growing government deficits. To finance this deficit and to promote growth, which had started to stall, the capital account was liberalized. These developments planted the seeds of the 1994 financial crisis. A triggering factor in this regard was a strategy to keep domestic interest rates low, which led to excessive money creation. Ozatay (2000) identifies the proximate cause of the 1994 crisis as a misguided strategy to keep domestic interest rates artificially low in order to prevent surges in inflation, which eventually led to the speculative attack on the Turkish lira and its rapid depreciation as well as losses in international reserves (Figure 3.1).

In the period following 1994 crisis, macroeconomic conditions in Turkey continued to deteriorate. The public sector borrowing requirements (PSBR) had reached over 15.6 percent of GNP by 1999 and duty losses of state banks were 14.3 percent of GNP, comprising a total of 28.9. The consolidated budget deficit during those years averaged at 7.7 percent of GDP (see Table 4 in Ozatay and Sak, 2003). These negative developments were reflected in high average treasury auction nominal borrowing rates (on average over

100 percent in the period considered)¹⁹. At the end of 1999 Turkey decided to ask for the IMF assistance and signed the stand-by agreement which aimed at correcting fiscal imbalances and featured a pre-announced crawling peg exchange rate with the pre-announced exit strategy. Unfortunately, four months before the pre-announced exit from the regime was due, overnight interest rates jumped to 6,200 percent, the exchange rate system collapsed, and a huge decline in reserves was observed as seen in Figure 3.1. As Ozatay and Sak (2003) discuss, although the IMF stabilization program had started to reverse the unsustainable fiscal stance, the exposure of the banking sector (both private and public) to capital reversals increased throughout 2000. In addition to financing high public sector borrowing requirements, currency and maturity mismatches were growing in the Turkish banking sector; large open foreign currency positions as well as nonperforming loans were observed. Growing problems in the banking sector resulted in interest rate increases and led to the debt rollover problems. Additionally, a current account deficit of nearly \$10 billion (Figure 3.1), reaching 5 percent of GDP emerged due to rising oil prices and appreciating currency. Financial turbulence cumulated in November 2000. The inconsistency between the interest rate level and the preannounced rate of depreciation of the Turkish lira as well as political turmoil eventually resulted in a full-blown crisis in February 2001. As a result, crawling peg exchange rate had to be abandoned and Turkey switched to a floating exchange rate system. This crisis was the worst crisis Turkey had experienced in its history with an unprecedented output loss of 5.7 percent in 2001.

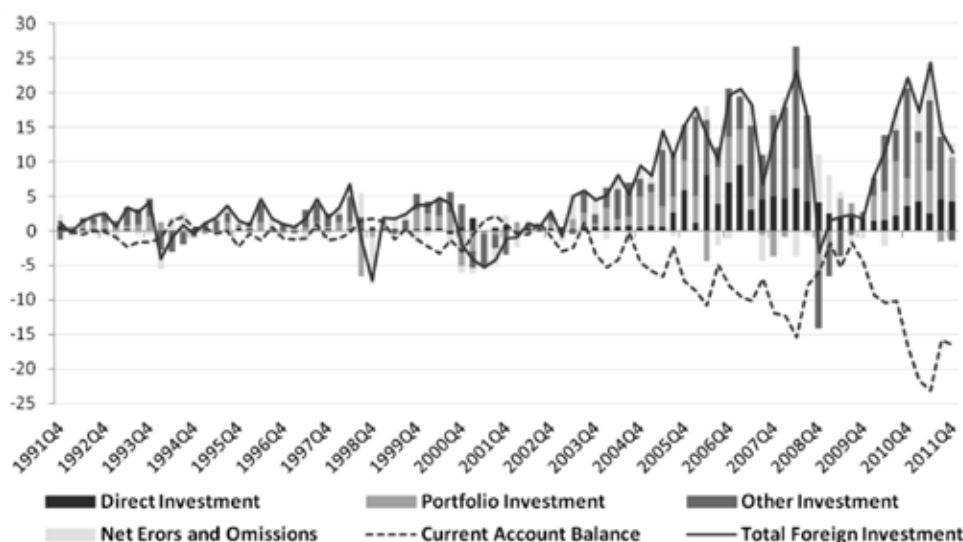
The 2008-09 crisis was considerably different from these previous two crises. First, contrary to previous episodes, the 2008 crisis was triggered by the external demand shock (OECD, 2008), although structural weaknesses in the domestic economy also had an impact. Second, the previous crises were the products of expansionary fiscal policies combined with problems in the banking sector under the managed exchange rate. Therefore, the crises manifested themselves as currency crises and necessitated external financial assistance. On the contrary, during the turmoil of 2008-09, the exchange rate fluctuations were much smaller than in past crises²⁰. This is despite the fact that since 2001, Turkey has been following a floating exchange rate system. Furthermore, the improved economic fundamentals due to sound monetary policy strategy (inflation targeting framework together with the central bank independence) in combination with prudent fiscal policies and the reforms in the banking and financial sectors introduced in the aftermath of 2001 crisis alleviated spikes in interest rates and inflation; the banking and financial sectors remained stable. Nonetheless, the recession in the aftermath of the crisis was sharp with the drop in GDP of 4.8 percent in 2009. As discussed in the 2010 OECD paper, the GDP contraction was mainly channelled through trade and financial linkages. Confidence declines and smaller automatic stabilizers compared to other OECD countries also played a role (OECD, 2010).

¹⁹ At the same time, the average inflation in consumer prices in Turkey reached around 80 percent.

²⁰ In the second half of 2008, the Turkish lira depreciated by around 15% in effective terms, whereas in the past crises depreciation was on average around 35% (OECD, 2010).

In what follows we will examine movements in the capital flows with special attention to trends during years of financial turbulence detailed above. Figure 3.2 presents the developments in financial and current accounts in Turkey's balance of payments since 1991²¹.

Figure 3.2 Inward Components of Turkey's Financial Account and Current Account Balance (\$ billions)



Source: Central Bank of Turkey

Note: The Figure gives the main components of Financial Account of BoP as well as Net Errors and Omissions and Current Account Balance. Total Foreign Investment is the sum of all inward items of Financial Account as well as Net Errors and Omissions, due to the fact that the latter generally reaches a sizable amount in case of Turkey.

What is clear from Figure 3.2 is that although the capital account in Turkey was fully liberalised in 1989, the weak economic performance of the economy combined with general volatility in emerging markets, did not generate significant capital inflows to the country. Indeed, foreign capital flows to Turkey prior to 2004 were minor and hardly reached \$5 billion on a quarterly basis. However, these trends progressively changed due to the improved economic fundamentals after the 2001 crisis as well as favourable global liquidity conditions. Annual capital inflows, which were \$28 billion in 2004, fluctuated between \$50-60 billion annually during the years 2005 to 2008. After falling to \$7.5 billion in 2009, total capital inflows recovered with \$60 billion in 2010 and reached \$67 billion in 2011, surpassing the levels of the pre-global crisis period.

²¹ The figure starts in 1991 Q4 due to the lack of quarterly data for the period between 1989Q1-1991Q3.

Despite relatively low capital inflows in years prior to 2004, sharp capital reversals and current account improvements occurred during the crisis episodes of 1994 and 2001 (see the Figure 3.2). Apart from the capital loss during 1994 and 2001 crises, capital outflows from Turkey reached the historic high in the last quarter of 1998. This is due to the contagion from the Russian financial crisis, which also affected other emerging economies.

To provide a point of comparison of capital flow movements in the follow-up and the aftermath of the crises that Turkey experienced, we observe that total cumulative capital inflow was \$17.5 billion during the two years prior to the 1994 crisis and \$4.8 billion outflow was recorded in 1994. Likewise, a \$22.2 billion of foreign investment flow to Turkey was recorded starting from 1999 until the last quarter of 2000 while the cumulative capital outflow during 2001 crisis was \$17.8 billion. By contrast, compared to the uninterrupted inflow totalling \$274 billion in the period 2003-2008, the capital outflow of \$3 billion during the 2008-09 global crisis was negligible. In accordance with this finding, the current account did not revert to surplus, in contrast to the previous two crises, even though it narrowed considerably. One reason behind this large correction in the current account is that crises and contagion are endemic to financial globalization (Rodrik, 2009), and that investors usually perceive all emerging markets to be alike²². The fact that the global crisis spread from the US not only to Turkey, but also to Eastern Europe seems to confirm this standpoint.

3.2 Components of Capital Flows to Turkey

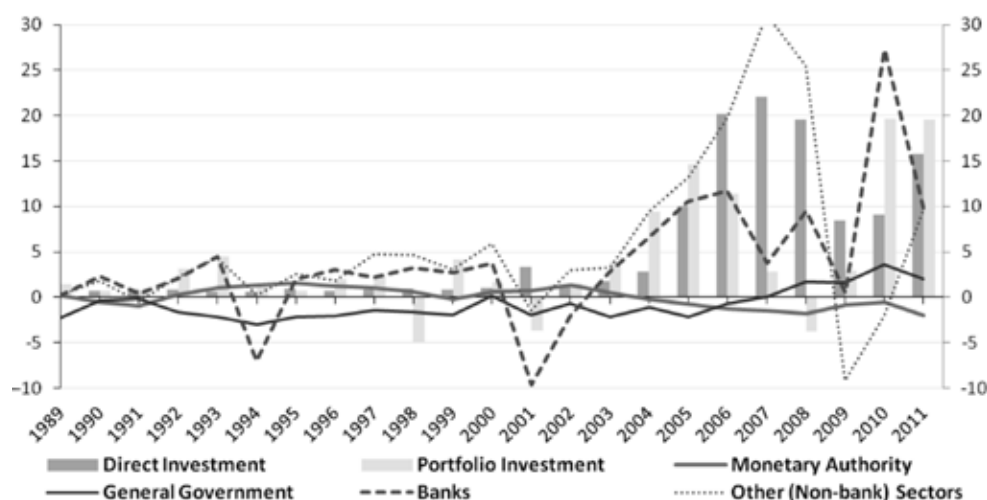
To assess the role of capital flows to Turkey in contributing to financial crises, it is important to analyse the developments in individual components of these flows. In what follow the analysis of flows with respect to different types of foreign investment is conducted. The types of investment are direct, portfolio (equity or debt securities) and other investments differentiated according to institutional sectors (general government, monetary authority, banks and other sectors) as detailed in Financial Account of the Balance of Payments.

As indicated, private capital flows to Turkey prior 2003 were minor. This is also confirmed when analysing Turkey's liabilities in Financial Account of Balance of Payments (Figure 3.3 and Table 3.1). Among those flows, between 1989 and 2002 the largest net capital flows took the form of Other Investments with \$27 billion. Out of this category, Monetary Authorities, Banks and Other Sectors received bulk of the capital inflows while General

²² Interestingly, capital reversed from Turkey not only during the times of financial crisis, but also due to contagion effects from other crises. As Figure 3.1 shows, in association with the 1998 Russian crisis, capital outflows from Turkey reached the historic high in the last quarter of 1998 although no crisis *sensu stricto* was observed. This again can be due to the investors' perception about emerging markets.

Government was a net payer. Although annual portfolio flows were larger than annual foreign direct investment flows for most of the years up to 2002, cumulative differences are not that significant (i.e. \$15 versus \$14 billion, respectively). This is due to large portfolio investment reversals observed in 1998 and 2001 reaching \$5 billion and \$3.7 billion, respectively.

Figure 3.3 Main Components of Turkey's Liabilities in Financial Account of Balance of Payments (\$ billions)



Note: The data was sourced from Balance of Payments Statistics, Central Bank of the Republic of Turkey (CBRT). Portfolio flows consist of equity and debt securities whereas Monetary Authority, General Government, Banks and Other Sectors fall into Other Investment category of financial accounts

On the contrary, foreign direct investment reached \$3.3 billion in 2001, its historically highest level up to this date²³. Nonetheless, portfolio flows did not play a major role in capital reversals associated with financial crises in years 1994 and 2001. Instead, the capital outflows stemmed mainly from heavy debt repayments by the government throughout 1989-2002 (with the exception of 2000) and from reversals in bank credits in 1994 and

²³ The FDI inflow in 2001 is exceptional and to great extent related to Telecom Italia and HSBC acquisitions.

2001. For example, debt repayments by the central government shows that during 1989-93, a cumulative outflow of \$6.7 billion was observed followed by additional \$3 billion in 1994. Similarly, although credits received by Turkish banks between 1989 and 1993 reached \$9.5 billion, 1994 witnessed an outflow of \$7 billion. While cumulative inflow of portfolio investment during the pre-1994 crisis episode marginally exceeded foreign capital received by banks (an inflow of over \$10 billion was recorded), no outflow was observed in the crisis year, i.e. in 1994.

In the second half of the 1990s, government continued its debt repayments. However, banks became much more important actors in the Turkish financial system as indicated by a total increase of almost \$17 billion in bank liabilities during 1995-2000. This inflow preceded an outflow of \$9.6 and \$2 billion in 2001 and 2002, respectively. While portfolio investments could not outpace capital flows via banking and non-banking sectors, they started to be more effective in capital reversals after the Russian financial crisis 1998²⁴. Between 1995 and 2000 capital inflow in the form of portfolio investments of \$5.7 billion lead an outflow of \$4 billion in 2001.

Table 3.1 also shows the trends in capital flows to Turkey between 2003 and 2011, the years which include the global crisis. As in the past, also during this period, Other Investment item of Turkish Financial Account remained the most important category, within which Banks and Other Sectors were main credit receivers. However, unlike in the past, the cumulative magnitudes of portfolio investments became comparable with those of credits obtained by banks (\$80 billion versus \$82 billion). Although, portfolio investments in the form of equity securities fluctuated to a great extent during this time, they did not turn negative on the annual basis until 2011. On the contrary, there were outflows in debt securities amounting to \$2.4 and \$4.5 billion in 2007 and 2008, respectively, which had increased continuously up to those dates. Additionally, it is worth stressing that in 2010 and 2011 portfolio investments exceeded \$19.5 billion, historical record in capital inflows of this type, the bulk of which comprised debt securities.

²⁴ Due to the contagion effects, capital flight in equity and debt securities surpassed \$5 billion in 1998.

Table 3.1 Turkey's Liabilities in Financial Account and Net Errors and Omissions in Balance of Payments
(\$ millions)

	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Direct Investment	663	684	810	844	636	608	885	722	805	940	783	982	3,352	1,082	1,751	2,785	10,031	20,185	22,047	19,504	8,411	9,038	15,732
Portfolio Investment	1,445	681	714	3,165	4,480	1,123	703	1,950	2,344	-5,089	4,188	1,615	-3,727	1,503	3,851	9,411	14,670	11,402	2,780	-3,770	2,938	19,617	19,527
Equity Securities	17	89	147	350	570	989	195	191	8	-518	428	489	-79	-16	905	1,427	5,669	1,939	5,138	716	2,827	3,468	-986
Debt Securities	1,428	592	567	2,815	3,910	134	508	1,759	2,336	-4,571	3,760	1,126	-3,648	1,519	2,946	7,984	9,001	9,463	-2,358	-4,486	111	16,149	20,513
Other Investment	-1,640	3,199	-1,240	2,896	7,655	-8,397	3,939	3,970	6,531	6,762	3,566	10,389	-12,296	1,603	4,461	14,657	20,834	29,492	33,482	34,824	-8,007	28,250	19,329
Monetary Authority	156	-535	-939	255	1,036	1,362	1,556	1,255	1,026	571	-231	619	735	1,336	497	-209	-787	-1,268	-1,450	-1,791	-901	-553	-1,965
General Government	-2,317	-393	-201	-1,645	-2,177	-2,962	-2,131	-2,108	-1,456	-1,655	-1,932	117	-1,977	-669	-2,194	-1,163	-2,165	-712	82	1,742	1,602	3,580	1,982
Banks	240	2,279	396	2,100	4,495	-7,053	1,973	3,046	2,232	3,195	2,655	3,736	-9,644	-2,016	2,846	6,564	10,524	11,704	3,736	9,457	514	27,254	9,744
Other Sectors	281	1,848	-496	2,186	4,301	256	2,541	1,777	4,729	4,651	3,074	5,917	-1,410	2,952	3,312	9,465	13,262	19,768	31,114	25,416	-9,222	-2,031	9,568
Net Errors and Omissions	1,007	-583	924	-1,190	-2,156	1,911	2,459	1,499	-987	-713	1,302	-2,661	-2,127	-758	4,420	1,071	2,738	185	1,170	4,120	4,147	2,733	12,461

Source: Balance of Payments Statistics, Central Bank of Turkey

Looking at capital flows via the banking sector since 2003, it is clear that unlike in years 1989-2002 foreign creditors of Turkish banks did not ask for repayment around the 2008 turmoil though they might have refused to roll-over the loans²⁵. Indeed, the balance of payments statistics show that following an inflow of cumulative \$45 billion over 2003-08, the banking sector was able to obtain a further \$0.5 billion of credit in 2009. This could be attributable to reforms conducted in the banking sector in the aftermath of 2001 crisis in general, and the implementation of new lending rules in June 2009 in particular. The 2009 law allowed Turkish banks to extend foreign currency denominated loans of minimum \$5m and with at least one year maturity. With the implementation of the new rules, the distortion that artificially inflated Turkey's non-banking private sector external debt was removed and the loans extended to residents in Turkey were shifted from local banks' foreign branches to their domestic branches. Table 3.2 shows that there is a \$10.6 billion decrease in such loans in 2009, which exceeds the \$9.2 billion decrease in the non-banking private sector's liabilities given in Table 3.1 for the same year. Hence, it can be concluded that no significant capital outflow occurred during the global turmoil in any component of the Financial Account, since non-banking private sector was responsible for the bulk of the capital outflow in 2009.

Table 3.2 Selected Balance Sheet Items of Banks' Branches Abroad With Residents in Turkey (\$ billions)

	2003	2004	2005	2006	2007	2008	2009	2010	2011
Loans Extended in FX	9.1	12.9	19.0	27.8	39.9	64.7	54.1	44.8	43.5
Deposits	1.7	2.5	4.1	7.3	8.9	9.2	8.6	10.3	6.1

Source: Central Bank of Turkey

Finally, direct investments became a more significant item in Turkish financial accounts in years 2003-2011. This is especially so after 2004 when Turkey was given a date to start negotiations with the EU in October 2005. Indeed, during 2003-2008, FDI inflows fluctuated around \$20 billion and outpaced the credits received by Turkish banks from foreign capital markets. Following the global crisis this tendency has been reversed with FDI inflows being reduced to just below \$10 billion in 2009 and 2010. Although FDI flows reached almost \$16 billion in 2011, they did not return to pre-crisis level of approximately \$20 billion.

Besides the liability components of the Financial Account, Table 3.1 presents the Net Errors and Omissions of the Turkish Balance of Payments. This item seems to play a significant role in capital in- and out-flows, especially in years of turmoil. It is expected that there may be net errors and omissions in the accounts since data for balance of payments estimates are

²⁵ Alternatively, the reason for the stability in banks' foreign liabilities might be the lack of domestic credit demand, as expectations of consumers and investors alike plummeted at the onset of the global crisis.

often derived independently from different sources. However, a large, persistent residual that is not reversed should cause concern, as it is in the Turkish case. Nevertheless, an analysis of the determinants of the net errors and omissions is beyond the scope of this study.

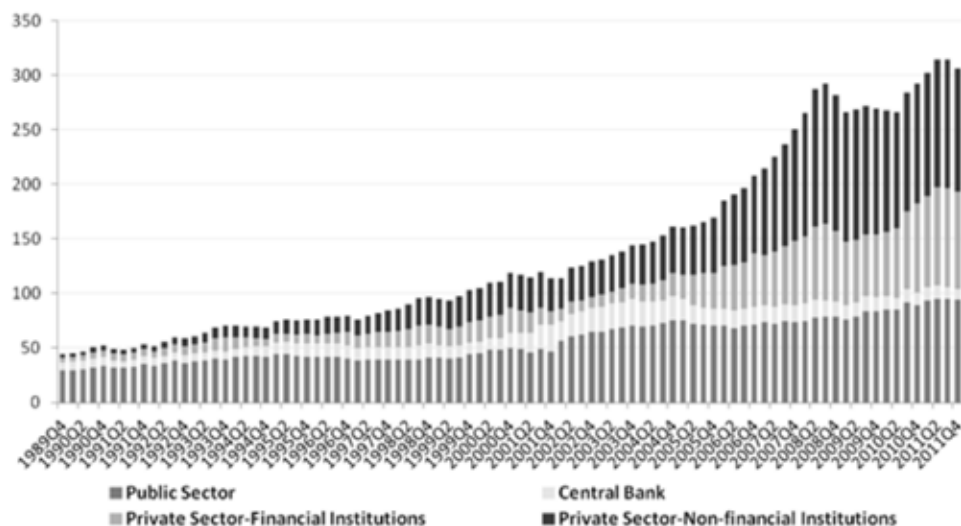
The developments in the components of capital flows to Turkey can be summarized as follows. First, the public sector was a net external debt payer rather than a net borrower until 2007. Second, foreign loans and credits made directly to the non-banking private sector have been typically more important than the loans and credits made through the banking sector until 2009.²⁶ Third, before the 1994 crisis, portfolio investments were more important than credits obtained by banking and non-banking sectors. This trend is reversed prior to the 2001 financial crash. Cumulative inflow of capital flows in years preceding the 2008 turmoil shows that although non-banking sector continued to be the main recipient of foreign investments, portfolio inflows exceeded inflows to the banking sector. Finally, during the post-global crisis period, credits obtained by the banking sector constituted the bulk of the capital inflows in 2010 together with portfolio inflows in the form of debt securities. The latter has become dominant in 2011, followed by foreign direct investment, which has partially recovered to its pre-crisis level.

3.3 Analysis of the debt stock of Turkey

In this section, we also examine the evolution and components of the external debt stock of Turkey. Table 3.1 shows that the flow of foreign capital to Turkey up to 2011Q4 has resulted in an external debt stock exceeding \$300 billion. In terms of the distribution of the external debt stock by borrower type (Figure 3.4), the public sector's foreign debt stock has been larger than the private sector's until 2006, but subsequently the situation has changed rapidly. Within two years of this date, the private sector total debt stock almost became twice the size of the total debt of the public sector and the central bank combined, which has remained relatively flat compared to the private sector total debt stock since 2003.

²⁶ This recent change seems to be related to decisions taken by Turkish government in June 2009 as mentioned above. The implementation of new rules decreased non-banking private sector's external debt. The new rules also explain the outflow of \$9.5 billion in this item in 2009. Finally, at least some portion of an enormous increase of \$27 billion in the liabilities of banks in 2010 might be related to this policy change, because companies probably repatriated deposits they had held in offshore branches of the Turkish banks (Table 3.2).

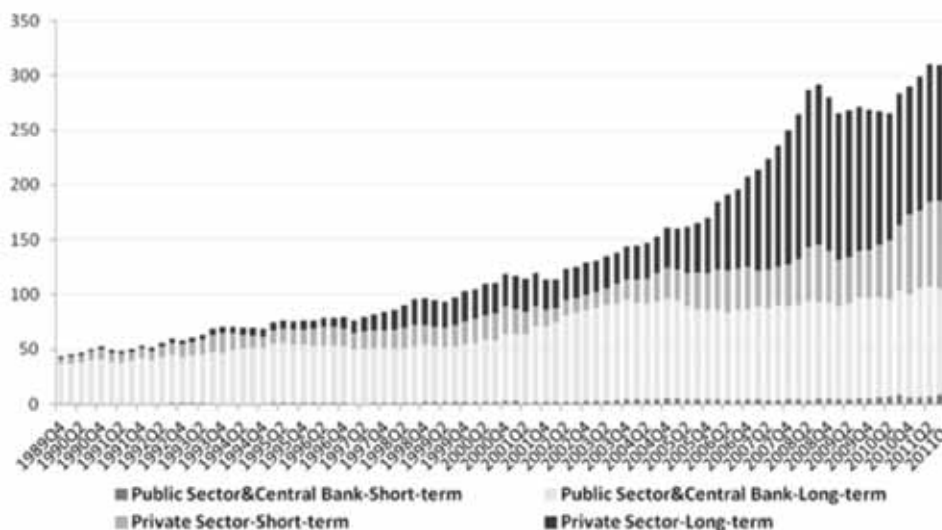
Figure 3.4 Turkey's Gross External Debt Stock by Borrower (\$ billions)



Source: Undersecretariat of Treasury

Within the private sector, the financial sector's foreign debt was typically much larger than that of non-financial sector prior to the mid-1994. By the end of 1996 and 1997, the external debt stock of the non-financial private sector had reached twice the size of the external debt of the commercial banking sector. However, because the loans and credits borrowed by the non-financial private sector have often carried guarantees by the domestic banking sector, the banking sector may not have been less exposed.

Figure 3.5 Main Components of Turkey's Gross External Debt Stock by Maturity (\$ billions)



Source: Undersecretariat of Treasury

In terms of debt maturity, Figure 3.5 shows that the sum of short-term debt of the public sector and the Central Bank has been negligible throughout the period under investigation. In the case of the private sector, the share of short-term debt in the total debt stock had reached nearly 80% by the beginning of 1990s, but it started to decline in 1994 and eventually reached a level of 24% by the beginning of 2008. However, this tendency was reversed in the aftermath of 2008-09 global crises, and the share of short-term debt in the total debt stock of the private sector reached almost 40% in 2011. This has led to growing concerns about the possibility of a “Sudden Stop” or reversal in capital flows.

In conclusion, this section has examined the changes in the balance of payments for Turkey in the period since 1989. It has provided a discussion of the three crises that Turkey experienced during this period and compared some of their salient characteristics. It has discussed the changes in the composition of capital flows to Turkey, and in particular, analyzed the behaviour in the run-up to the crises that Turkey experienced in the last two decades. This analysis shows that there have been some significant changes in the nature and magnitude of capital flows to Turkey, which have implications for Turkey's external vulnerabilities and crisis proneness.

SECTION 4

VULNERABILITY INDICATORS ASSOCIATED
WITH (TOO) LARGE CAPITAL INFLOWS

History shows that large capital inflows accompanied by massive current account deficits require attention from policymakers. Hence, monitoring recent economic and financial developments in Turkey should help authorities to assess whether there is a build-up of domestic financial imbalances or mounting current account deficit in Turkey is simply a reflection of consumption smoothing. Whatever the case, taking into account present unfavourable external conditions, the outstanding current account deficit puts a strain on most liquidity segments of the Turkish economy and therefore should be carefully monitored. Hence, this section provides a preliminary overview of macroeconomic and financial indicators that tend to exhibit an unusual behaviour in periods preceding crises (e.g. Kaminsky, Lizondo and Reinhart (KLR), 1998). The chosen indicators are analysed using quarterly data. In Section 4, a more formal analysis is conducted, i.e., a classical early warning exercise à la KLR is performed. These two parts should help assessing the degree of imbalances accumulated in Turkey since 2010 and their causes.

4.1 Current account balance and the real exchange rate

The ratio of the current account to GDP is a common sign of unsustainable macroeconomic policies. For example, a large ratio of a current account deficit (above 5% of GDP) was a warning signal in the previous episodes of financial crises²⁷. Moreover, as pointed out in Reinhart and Reinhart (2008), the papers by Edwards (2005) and Freund and Warnock (2006) find an important role for the textbook forces thought to rein in a current account imbalance—a slowing in income growth and real depreciation. Finally, according to many empirical studies (Sachs, et al. 1996; Kaminsky, et al. 1998; Flood and Marion, 1998), appreciation of the real exchange rate is closely associated with incidents of crisis. For these reasons, below, the developments in Turkish current account and real exchange rate are evaluated.

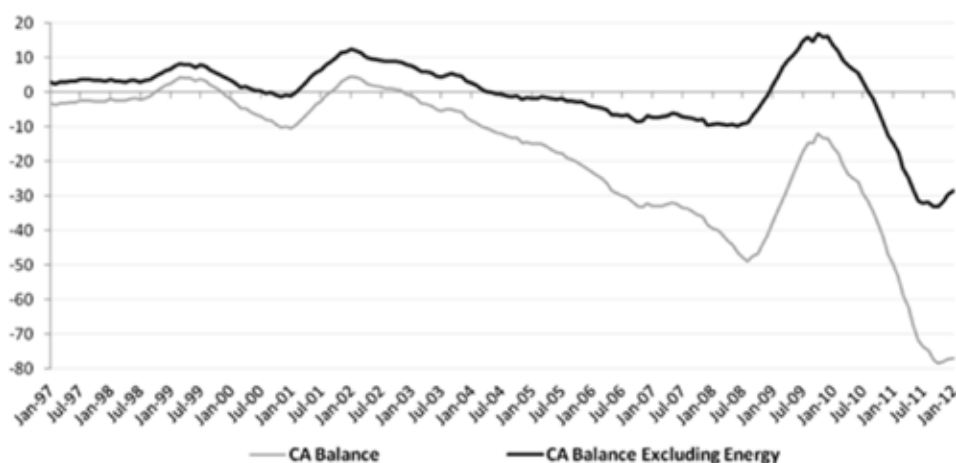
The recent developments in the behaviour of the current account (CA) deficit of Turkey are indeed worrisome. Until mid-2004, the current account deficit was minor and there even was a surplus in the non-energy balance (Figure 4.1). In parallel to the rapid growth during 2003-2007, the volume of energy imports of Turkey increased by 300%²⁸. Therefore, together with the hike in global energy prices, energy imports accounted for the bulk of the CA deficit of almost \$50 billion, as seen in the widening gap between the actual and non-energy CA balance until mid-2008. Expressed as a percentage of GDP, this CA deficit corresponds to a record magnitude of approximately 7% (See Figure 4.2) between 2006 and

²⁷ See Frankel and Saravelos (2010) or Freund and Warnock (2005) among others.

²⁸ As proxied by mining and quarrying index in “Annual and quarterly volume indices by economic activities” database of TurkStat.

2008. Furthermore, in the post-crisis period, especially after the second half of 2010, the current account balance deteriorated further until October 2011, even excluding net energy imports that reached \$45.5 billion annually²⁹.

Figure 4.1 Turkey's Current Account and Non-energy Current Account Balance (\$ billions)



Source: Central Bank of Turkey, TurkStat

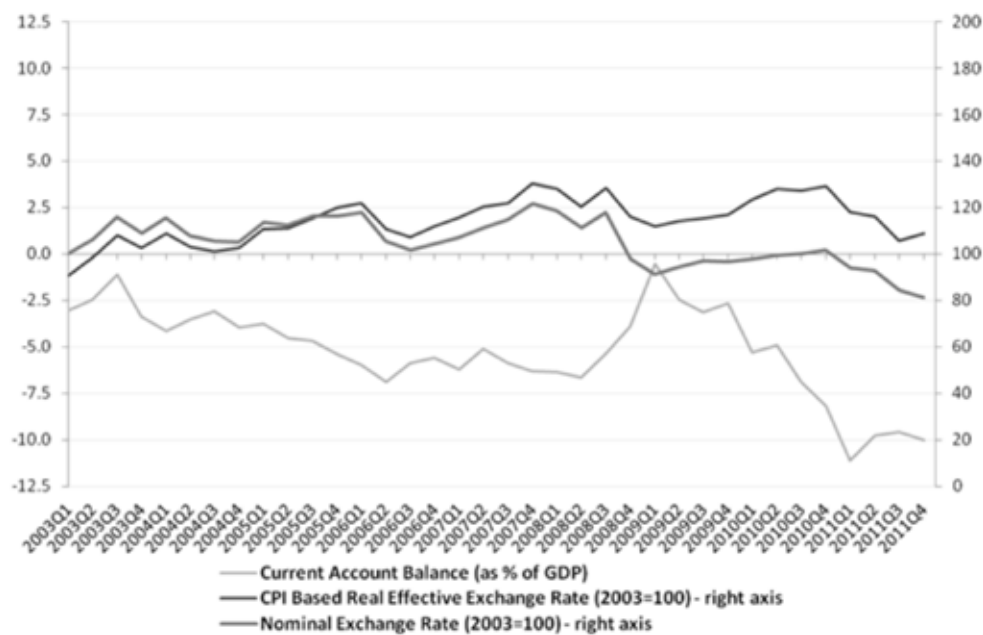
Figure 4.2 depicts both the real exchange rate and current account balance as percentage of GDP in the post 2003 period for Turkey. The real exchange rate seems to have appreciated³⁰ every two years, followed by corrective episodes. During the latest episode, the total appreciation with respect to 2003 was 30% in the last quarter of 2010. As expected, there is a negative relationship between the CA balance and the real exchange rate. Typically, real exchange rate appreciation has been associated with a current account deficit in Turkey. However, there have been periods when a real appreciation was associated with the improvement in the current account balance such as happened in 2003.

The changes in the CPI-based real effective exchange rate with respect to developed and developing countries provide more insight into the general picture. As shown in Figure 4.3, real effective exchange rate appreciation in Turkey is moderate with respect to other developing countries, especially in the post 2008-09 crisis. This is not the case when the appreciation against developed countries is looked at.

²⁹ Annual net energy imports reached \$49.1 billion as of December 2011.

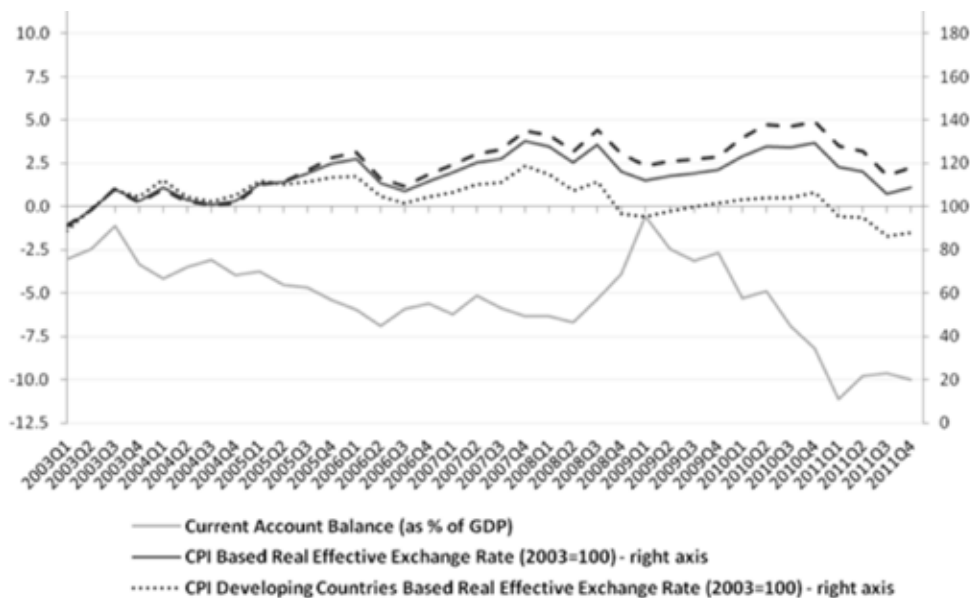
³⁰ Upward movement indicates appreciation.

Figure 4.2 Effective Real Exchange Rate Variation (2003=100) and the Current Account Balance (as % of GDP)



Source: OECD, Central Bank of Turkey

Figure 4.3 Developing and Developed Countries Based Real Exchange Rate Variation (2003=100) and the Current Account Balance (as % of GDP)



Source: OECD, Central Bank of Turkey

The average real effective exchange rate appreciation against advanced countries has been as high as 40% between 2003 and the end of 2010. This implies that although Turkish competitiveness against developing countries remained relatively stable, it deteriorated against advanced partners. On the one hand, the moderate recovery of Turkish exports in the post global crisis period can be justified by the empirical studies, which cannot find causality from real exchange rates to exports in Turkey.³¹ On the other hand, in accordance with the findings on bilateral causality between the real exchange rate and imports in Turkey (Aydın *et al.*, 2004), the appreciation of the real effective exchange rate against developed countries seems to play a role in the recent surge in imports³².

4.2 Financial account and its components

The financial account may be more important than the current account itself in triggering financial crises, since capital inflows are blamed to be a key component of crises.³³ This is also consistent with the Yoshitoni and Ohno's (1999) 'capital account crisis' theoretical framework³⁴. The ratio of the financial account to GDP (in percent) is used in the literature to assess the extent of capital inflows. In fact, the financial account has two components, which have opposite effects on the probability of the crisis. According to the theory and the subsequent empirical work, short-term capital inflows approximated by portfolio flows (debt and equity securities) increase the probability of the crisis, since such flows are considered more easily reversible. On the other hand, the literature suggests that the larger is the inflow of foreign direct investments (FDI) into the economy, the more stable is the BOP financing and the lower is the likelihood of sudden stops.

As explained in Section 3, portfolio investments started to play a role in Turkey's capital inflow reversals from 1998 onwards, with the reversals in equity securities have always been less important than debt securities. Instead, the major role in capital inflow reversals in Turkey have always been played by the **other investments** item of the financial account, especially the reversals in credits received by Turkish banks from foreign capital markets. Therefore, the **other investments** item of the financial account in the balance of payments as well as portfolio flows should be taken into account while assessing the potential role of excessive capital inflows in triggering financial crises.

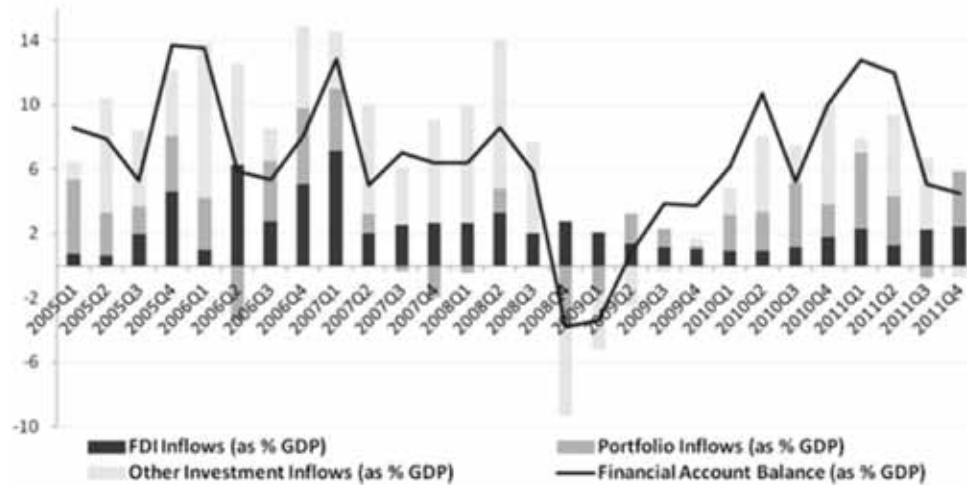
³¹ See Öz (2011) for a survey on the empirical studies on the relationship between the real exchange rates and trade in Turkey.

³² For developments in exports and imports see Section 4.

³³ Radelet and Sachs (1998).

³⁴ See also Blaszkiwicz (2002).

Figure 4.4 Turkey's Recent Financial Account and its Inward Components (as % of GDP)



Source: Central Bank of Turkey

In order to analyze the recent developments, Figure 4.4 shows the quarterly capital inflow components as a percentage of GDP since 2005. It's apparent that in the third quarter of 2011, there has been a decrease in short-term inflows, which stems from the reversal in portfolio inflows, while other investment inflows have continued. This tendency reversed in the last quarter of 2011, such that there were portfolio inflows but outflows were observed in other investment component of the financial account. Finally, if the increase in the inflow of FDI observed in the second half of 2011 continues, the vulnerability related to the BOP financing may lessen.

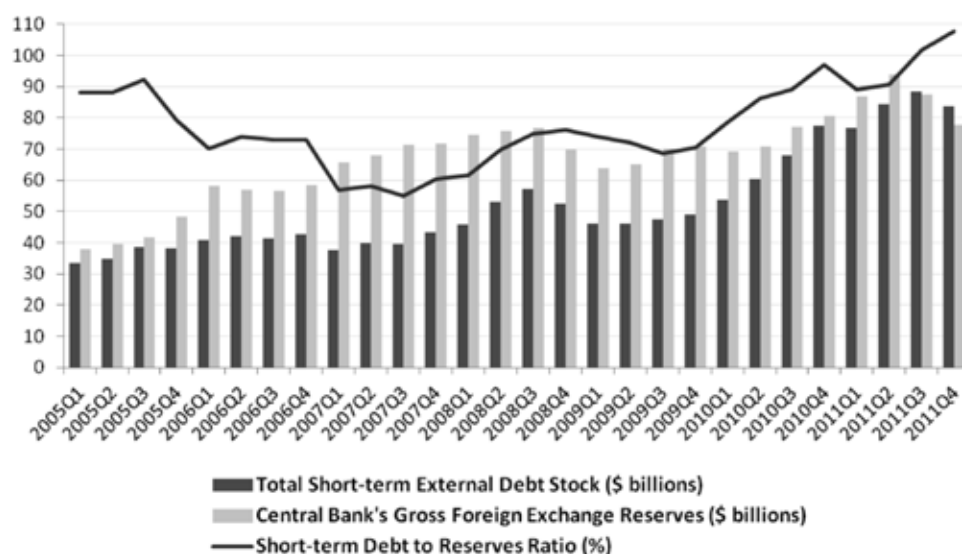
4.3 Liquidity indicators

Liquidity indicators are related to both the availability and the need for funds in the short-run. According to Frankel and Saravelos (2010), liquidity indicators, such as different measures of reserves adequacy, proved to be one of the two leading indicator groups mostly useful in explaining crisis incidence across different countries and crises in the past.³⁵ In the literature on financial crises, the first liquidity indicator related to the availability and the need for funds in the short-run, is the short-term debt-to-reserves. A high value of short-term debt to reserves variable suggests that the country becomes more vulnerable to the crisis. A crisis

³⁵ The real exchange rate is the other variable with explicatory power.

would be more consistent with liquidity problems whenever creditors refuse to roll over the debt. The indicator shows how quickly a country would be forced to adjust if it were cut off from external borrowing (IMF, 2000). According to the IMF (2000), reserves should at least exceed official and officially guaranteed short-term debt.

Figure 4.5 Turkey's Short-term External Debt Stock vs. Foreign Exchange Reserves



Source: Central Bank of Turkey, Undersecretariat of Treasury

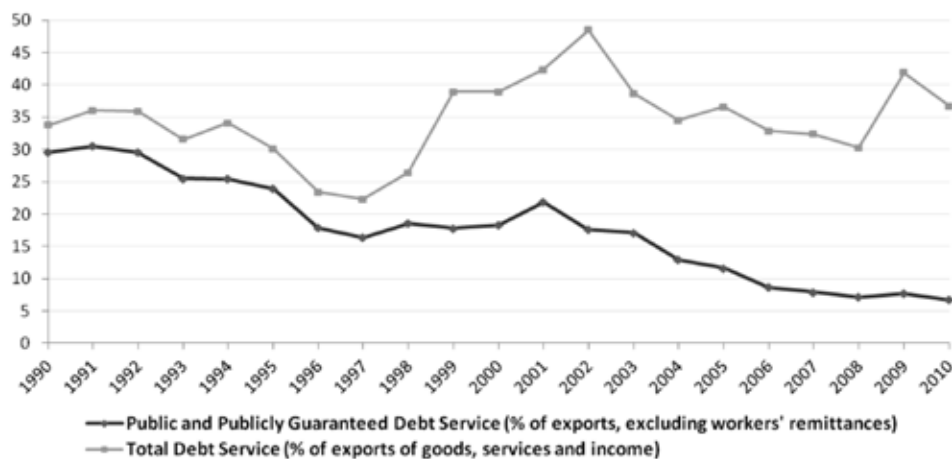
In the case of Turkey, until the third quarter of 2011, reserves exceed not only official and officially guaranteed, but also total short-term debt. However, it should be noted that the safe level of 100% in short-term external debt to reserves ratio is exceeded in 2011Q3, and further deteriorated in the last quarter of 2011, as shown in Figure 4.5.

The debt service to exports ratio is the second liquidity indicator, which helps to assess the external debt-servicing capacity of a country. It measures the cost of servicing debt in terms of the foreign exchange earnings of the country, i.e. current cash flow on debt servicing. The debt service ratio can be a useful indicator of the current debt servicing burden, e.g. if the ratio is 50 percent, it can be concluded that half of the export earnings is spent on total debt service³⁶. A rapid increase in this ratio might have significant negative effect on investment, capital formation and growth performance. Unfortunately, we could not find

³⁶ Total debt service is the sum of principal repayments and interest actually paid in foreign currency, goods, or services on long-term debt, interest paid on short-term debt and repayments to the IMF.

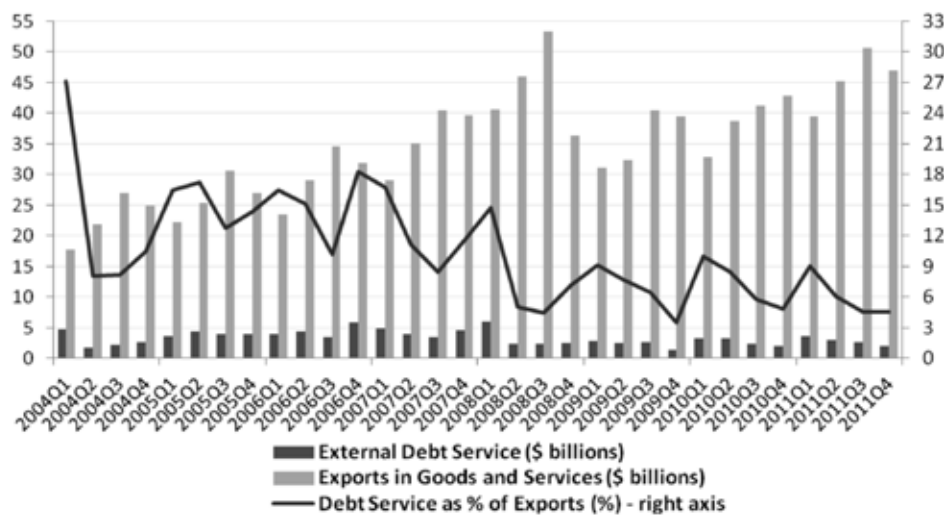
quarterly data on total debt service of Turkey to be able to assess the recent developments in this aspect. Figure 4.6, which shows the annual data, reveals that as percentage of exports, total debt service exceeded slightly 35% as of 2010, and is somewhat alerting.

Figure 4.6 Turkey's Annual External Debt Service (as % of exports)



Source: WDI Online

Figure 4.7 Central Government External Debt Service and Exports

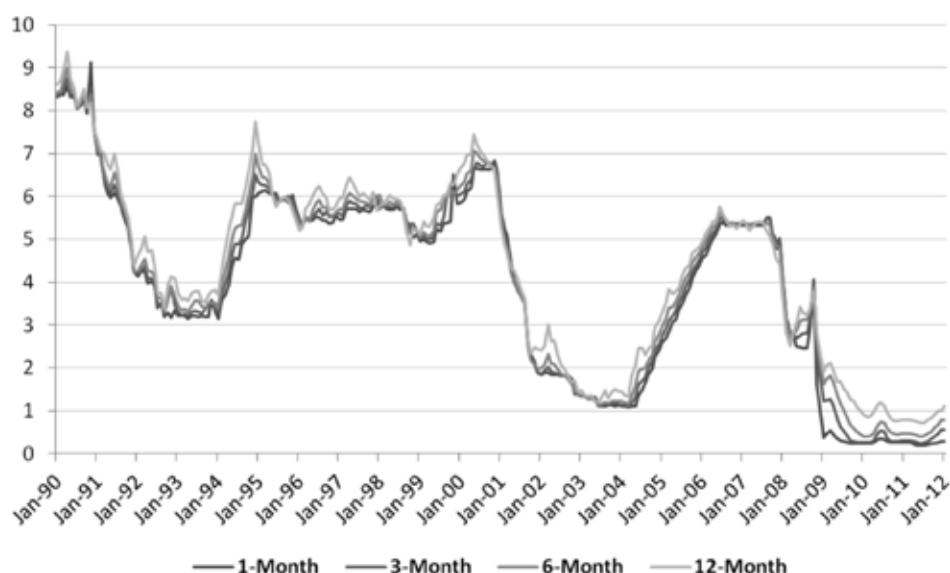


Source: Central Bank of Turkey, Undersecretariat of Treasury

However, as Figure 4.7 shows, there is no reason to be concerned about the liquidity indicator related to central government external debt service to exports of goods and services ratio, which fluctuates below 10% during the last 3 years, signalling no vulnerability with respect to debt burden of public sector.

The final liquidity indicator is related to the availability of the funds in the short-run, namely the global liquidity, for which LIBOR (London InterBank Offered Rates) is used as a proxy in this study. Frankel and Rose (1996), for example, find evidence on the role of international interest rates over the current account sustainability. An increase in interest rates in developed economies indicates that capital inflows may halt or even flow back to developed countries increasing the rollover risk in emerging economies.

Figure 4.8 LIBOR (London InterBank Offered Rates)



Source: www.wsjprimerate.us/libor/libor_rates_history.htm

Figure 4.8, which gives monthly values of LIBOR for different maturities since 1989, shows that since the outburst of the global crisis in the autumn of 2008, interest rates in developed economies have fallen to record lows of the last 2 decades covered in Figure 4.8. Furthermore, the slow recovery in the US³⁷ and the ongoing debt crisis in the EU³⁸ eliminate the risk of a rapid surge in LIBOR in the near future, thus the risk of a sudden reversal in capital flows to developing countries due to pull factors.

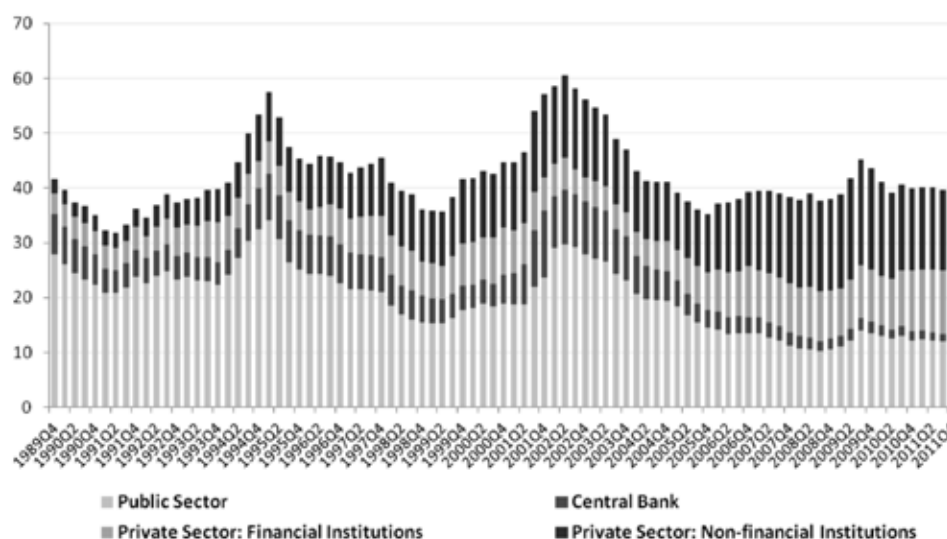
³⁷ The U.S. Federal Reserve declared at the beginning of 2012 that it likely won't raise interest rates from their current record low levels until late 2014.

³⁸ European Central Bank flooded markets with 1% three-year loans twice in two months that amounted to approximately 1 billion.

4.4 Solvency indicators

Solvency indicators are related to the capacity of a country to pay its external debt. High external debt ratios would be especially vulnerable if foreign financing dried up (IMF, 2008). The first solvency indicator is the ratio of total debt to GDP. Figure 4.9 depicts Turkey's total external debt stock as a percentage of GDP together with its distribution among the public sector, the Central Bank, and financial as well as non-financial private sectors.

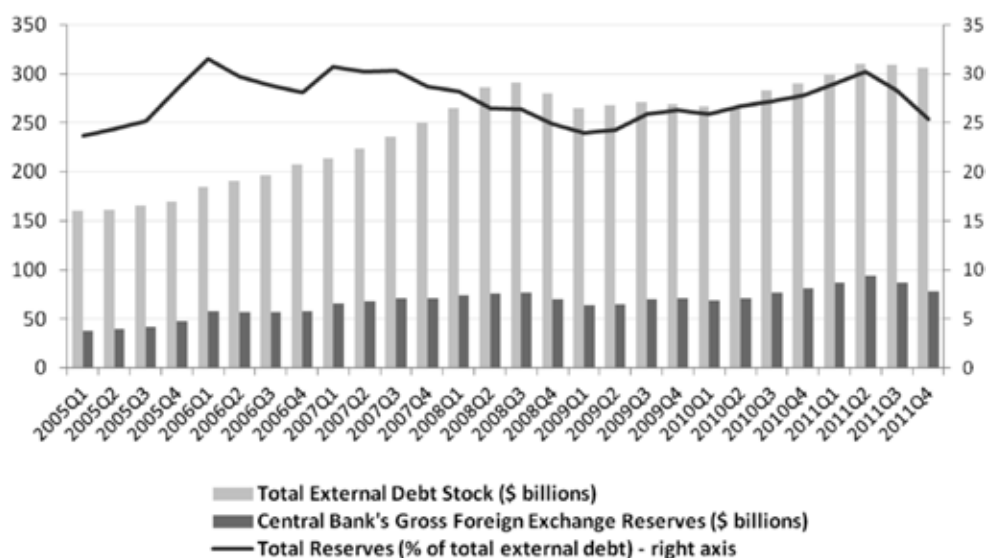
Figure 4.9 Turkey's External Debt Stock as % of GDP (%)



Source: Undersecretariat of Treasury, IFS

The highest level of the ratio of the total external debt stock to GDP for Turkey during the last decade was 60%, which was attained in mid-2002, after which it began to decline (see Figure 4.9). Regarding the debt components, the Central Bank's external debt to GDP ratio is of minor importance in comparison to other components. The public sector debt, which reached 30% during 2001 crisis, gradually came down and fluctuates around 12% in recent quarters. Finally, the private sector's external debt to GDP ratio increased steadily during the 1990's up to 20% just prior to 2001 crisis, dropped back to 15% during the crisis, then started to increase again after 2004. Since the beginning of 2008 it has stabilized at around 25%. Interestingly, the amount of the private sector's external debt did not change during the 2008-09 global crisis, though its ratio to GDP increased slightly due to the decrease in the denominator (GDP). In fact, the total external debt to GDP ratio has stabilized around 40% since the last quarter of 2006 despite the global crisis. Nevertheless this ratio is higher than the prudent external debt threshold of 15 to 30% of GDP mentioned in Reinhart and Rogoff (2004).

Figure 4.10 Turkey's Total External Debt Stock and Foreign Exchange Reserves



Source: Undersecretariat of Treasury, Central Bank of Turkey

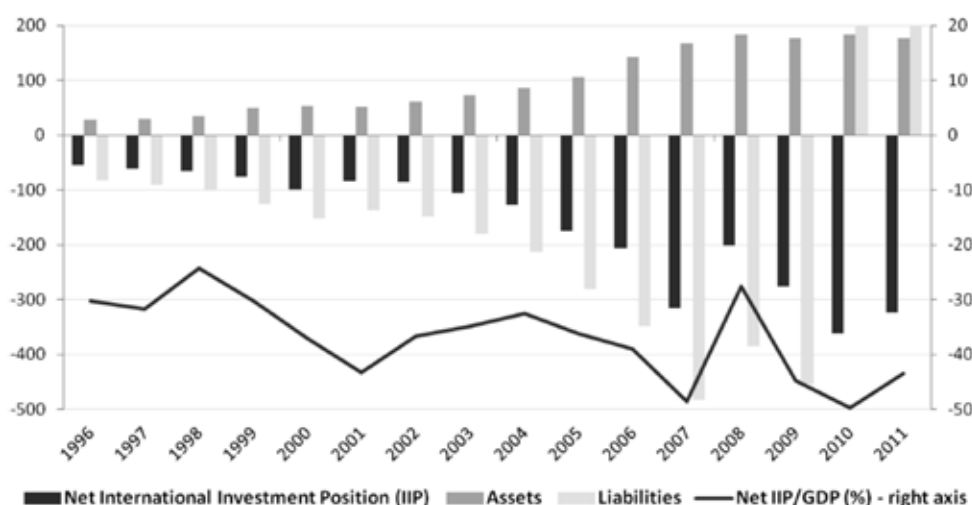
The second solvency indicator is the ratio of foreign exchange reserves to external debt. Radelet and Sachs (1998) find that the ratio of external debt to international reserves is a robust predictor of capital flow reversals³⁹. A low value of total reserves as percentage of total external debt is expected to increase the fragility of the economy, but the possible crisis would be more of the insolvency type. Figure 4.10 shows that Turkey's total external debt has almost doubled since 2005. However, the amount of foreign exchange reserves has more than doubled over the same time span, thus leaving the ratio of foreign exchange reserves to external debt fluctuate in a narrow band, specifically between 24-31%. Therefore, it is possible to deduce that the ratio of foreign exchange reserves to external debt does not seem to be at an alarming level and does not signal a vulnerability of the Turkish economy to a solvency type crisis.

The final solvency indicator mentioned in the financial crises literature and analyzed in this section is the ratio of net international investment position to GDP. As indebtedness of a country increases, the net international investment position, which is the stock of external assets minus the stock of external liabilities, increases. Figure 4.11 shows that the stock of external assets, which increased steadily from 1996 to 2008, has stabilized around \$180 billion since then. By contrast, the stock of external Turkish liabilities has been increasing

³⁹ Table A.1 in Appendix 1, presents the gross external debt stock of Turkey with respect to maturity, as well as its distribution among public sector, the Central Bank of Turkey, and private sector.

except for the crisis years of 2001 and 2008, during which the recovery to the pre-crisis level took more than 2 years. Accordingly, the ratio of the net international investment position to GDP, which was -48.7% in 2007, first increased to -27.6% as of end-2008 and returned back to the same ratio at the end of 2010. These developments are clearly a reflection of the Turkish current account performance. When combined with post-global crisis changes in the structure of capital flows to Turkey, they point out to the increasing risk to an external crisis. The fall in the ratio of the net international investment position to GDP to -43.4% in 2011 reflects that some adjustment in IIP has already started.

Figure 4.11 Turkey's International Investment Position

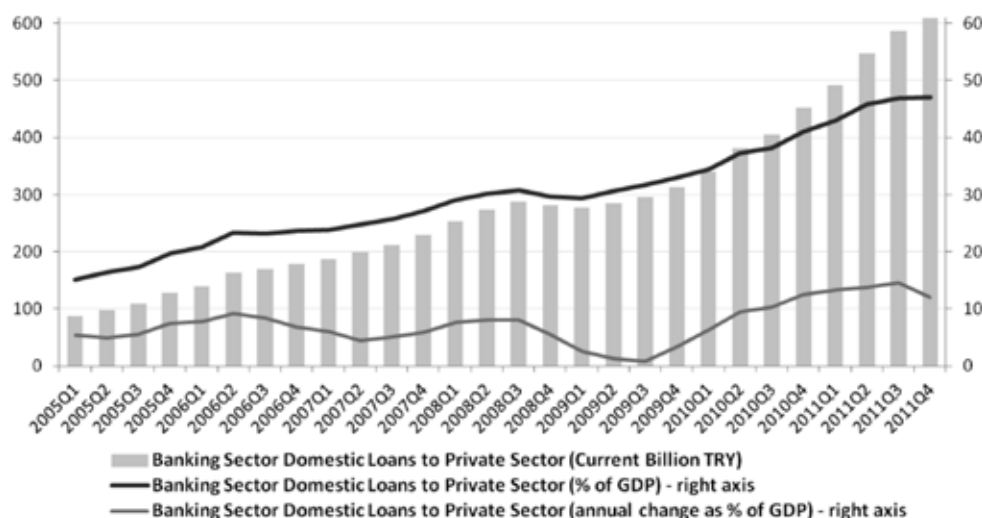


Source: Central Bank of Turkey

4.5 Financial indicators

The ratio of banking claims on the private sector to GDP, where total banking claims is the sum of the loans given to the private sector by deposit money banks and other financial institutions, is the first indicator used in this section to assess the country risk associated with the financial situation. Countries with rapid build-up of bank credit are considered to have a more fragile banking system and greater probability of bad loans, thus greater vulnerability to a crisis (Sachs, Tornel and Velasco, 1996). The higher the ratio, the greater is the risk of a crisis. Implicitly, this ratio may also indicate the quality of loans. Rapid expansion of domestic credits is a feature of the pre-crisis period in Mexico, Indonesia, Thailand, Malaysia, and Korea. For example, in case of Indonesia, the expansion of domestic credit exceeded 20 percent of GDP in the pre-crisis years.

Figure 4.12 Turkey's Banking Sector Domestic Loans to Private Sector

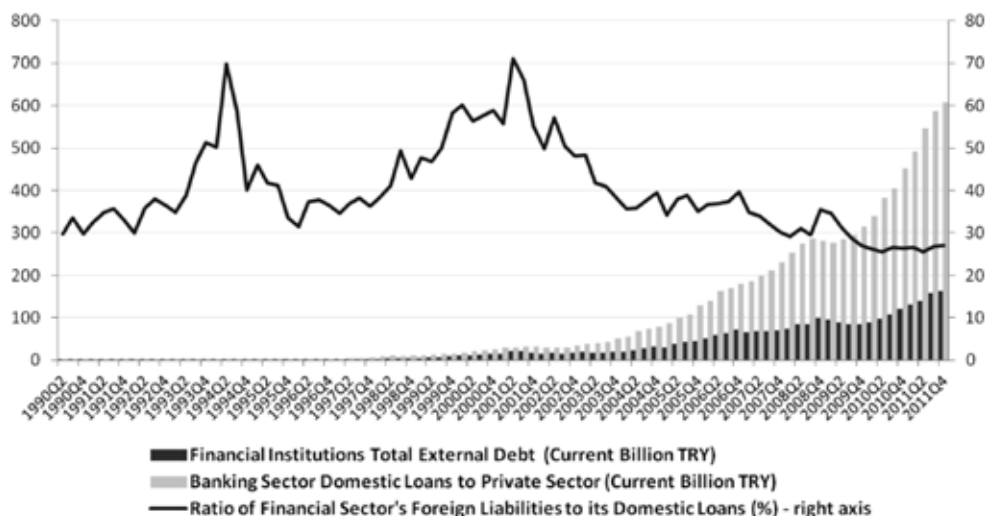


Source: Central Bank of Turkey

Figure 4.12 illustrates that in Turkey, the annual increase in private sector domestic loans as percentage of GDP reached 15 percent in the third quarter of 2011, the historically highest ratio before falling to 12 percent in the last quarter. The ratio of private sector loans to GDP was as high as 47 percent in the second half of 2011. The financial literature lists macroeconomic stability, robust growth, good economic prospects, a rise in market confidence, bank restructuring, and capital market liberalization as the main reasons for a fast credit growth. Among these reasons, robust growth; good economic prospects, and a rise in market confidence seem to be relevant for Turkey in the post-global crisis era. Additionally, historically low real interest rates (see Figure 4.22) undoubtedly contributed to those developments.

The second financial indicator is the currency mismatch, which signals to what extent an entity's net worth or income (or both) is sensitive to changes in the exchange rate. The ratio of the banking system's foreign liabilities to its domestic assets (loans) can be used as proxy to determine whether there exists a currency mismatch in the financial sector. The higher is this ratio, the more vulnerable is the banking sector to shocks such as rapid currency depreciation or devaluation in case of fixed exchange rate regime. Devaluation/depreciation increases the value of bank's liabilities, but there is no simultaneous rise in bank's assets since they are in domestic currency. Therefore, it is obvious that currency mismatch increases banks' currency risk.

Figure 4.13 Turkey's Banking Sector Foreign Liabilities and Domestic Loans to Private Sector



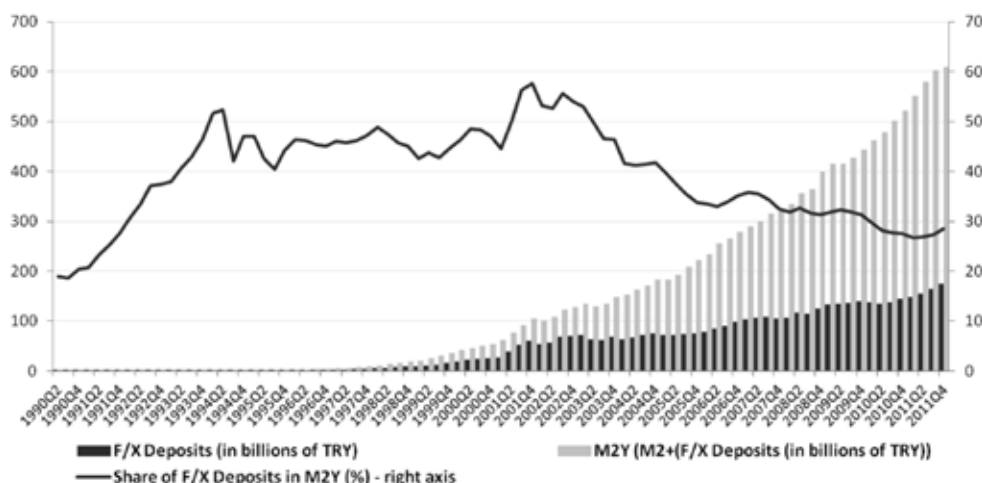
Source: Central Bank of Turkey, IFS

Figure 4.13 plots the financial sector's foreign liabilities, the banking sector's domestic loans to the private sector, as well as their ratio since the beginning of 1990. It is clear from the figure that when the ratio of financial sector's foreign liabilities to banking sector's domestic loans to private sector is higher than 40-50%, as it is the case prior to 1994 and 2001 crises, the risk associated with currency mismatch is realized. However, following the 2001 crisis, the ratio of the financial sector's foreign liabilities to banking sector's domestic loans to the private sector, though fluctuating to a certain extent due to the global turmoil, nevertheless decreased to 26% as of mid-2011, thus implying no apparent currency mismatch.

The second proxy to determine whether there exists a currency mismatch in the financial sector is the ratio of foreign exchange denominated deposits in the banking system to the M2 money supply. A high and/or increasing share of FX-denominated deposits with respect to M2 increases borrowers' default risk if depreciation occurs. As households start to hold more foreign currency in their bank accounts, banks may find themselves in a position to make loans in the foreign currency to cover the exchange rate risk. This kind of substitution does not however eliminate the risk the banks are exposed to. It transfers it from one form (*currency risk*) to another (*default risk*) because some of these loans eventually go to non-traded goods sectors, where the returns are not necessarily indexed to the foreign currency.

As the recent financial crises in developing economies have shown, when the country's currency loses value due to devaluation or rapid depreciation, currency mismatches or loan defaults may undermine the financial stability.

Figure 4.14 Foreign Exchange (F/X) Deposits and M2Y (M2 + (F/X Deposits))



Source: Central Bank of Turkey, IFS

Figure 4.14 shows foreign exchange (F/X) deposits in terms of Turkish Lira and M2Y, which is the sum of M2⁴⁰ and F/X deposits, together with their ratio. It is obvious that the share of foreign exchange deposits in M2Y started to increase following the financial liberalization until the 1994 crisis and remained high during the hyperinflationary era between the two major crises in Turkey. After reaching a high of 57.5% by the end of 2001, together with the introduction of the floating exchange rate regime, the share of foreign exchange deposits in M2Y started to decline steadily until the first quarter of 2011, to 26.7%. However, in accordance with the depreciation of Turkish Lira since then, the ratio of foreign exchange denominated deposits in the banking system to M2 money supply started to increase slightly and reached 28.6% as of 2011Q4. In fact, the amount of foreign exchange denominated deposits of residents in dollar terms is the same in the first quarters of 2011 and 2012 with \$106 billion.

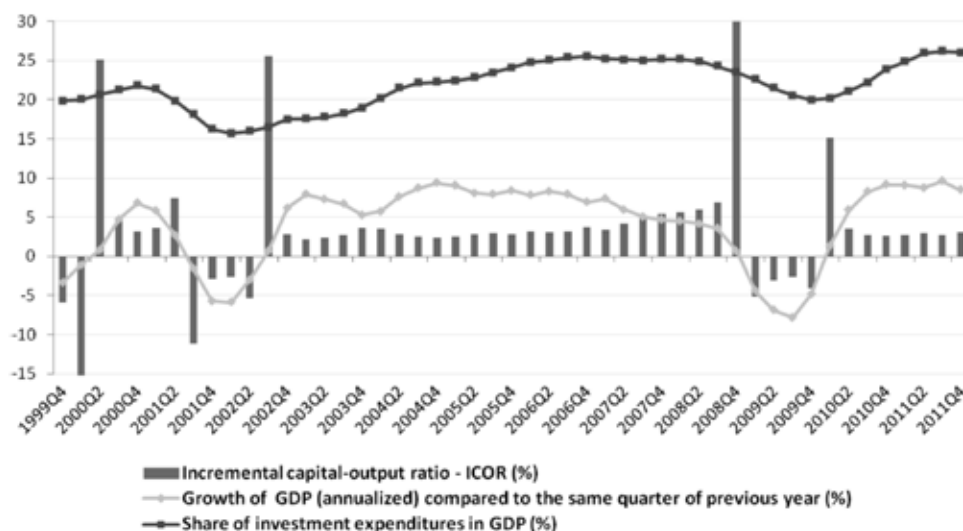
⁴⁰ M2 is a measure of total money supply and includes everything in M1 (currency in circulation plus sight deposits) and also savings and other time deposits.

4.6 Real sector indicators

Real GDP growth is the first indicator of country risk related to the real sector. Kaminsky and Reinhart (1999) hold that currency crises occur as the economy enters a recession following a prolonged boom in economic activity fuelled by credit expansion and capital inflows accompanied by overvaluing currency. On the contrary, as argued by Milesi-Ferretti and Razin (1996), a higher real GDP growth rate may imply that a country can sustain a higher current account deficit, both because the current account/GDP ratio will decrease and the country's ability to pay will increase.

The quarterly growth rate of annualized real GDP compared to that of the same quarter of previous year given in Figure 4.15 shows that after a period of boom-bust cycles, the Turkish economy managed to sustain high growth rates for four consecutive years starting from 2003. As of 2007, the economy moved to a lower growth path, which was followed by a collapse in output in 2009. Since mid-2010, the Turkish economy appears to have reverted to the high growth path. However, at this stage, it is not possible to deduce whether it is sustainable or not. Therefore, other indicators of real sector fragility are investigated below.

Figure 4.15 Real GDP Growth, Share of Investment Expenditures in GDP and ICOR (%)



Source: Central Bank of Turkey

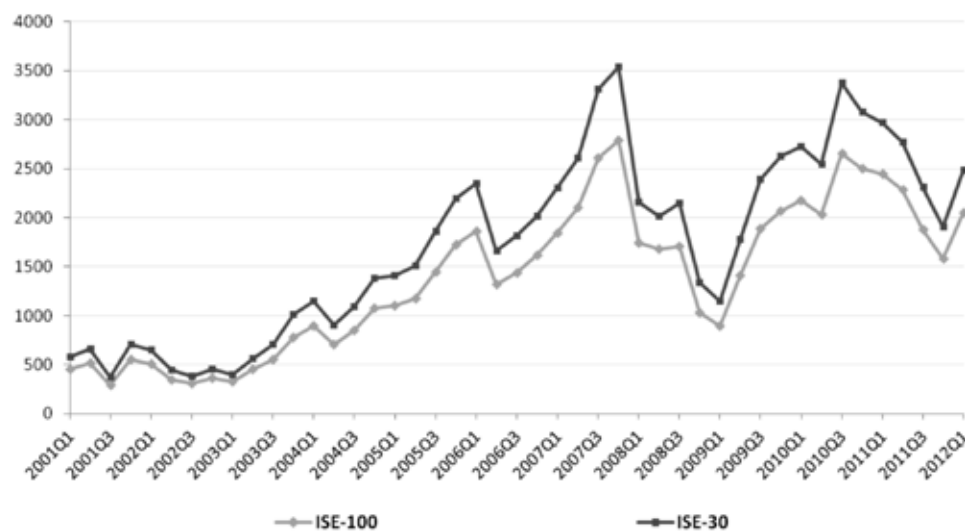
The next indicator used to assess the country risk related to the real sector is the ratio of investment expenditures to GDP (Figure 4.15). As the Southeast Asian crisis showed, many countries in this region prior to the 1997 crisis experienced a rapid increase in domestic investment, which often exceeded a 'safe' level of 40 per cent, as defined in Howell (1998). Figure 4.15 shows that the ratio of investment expenditures to GDP in Turkey falls as low as 15.7% during the 2001 crisis and increases steadily thereafter up to 25% at the beginning of 2006. Thereafter it remains flat until the global financial crisis. After falling to 20% in the course of the global crisis, the ratio of investment expenditures to GDP has been outpacing the pre-crisis levels, reaching a record high of more than 26% as of third quarter of 2011. Nevertheless this value is considerably below the 'safe' threshold, and therefore it is not alarming. Moreover, the ratio of investment expenditures to GDP has started to slow down in the last quarter of 2011 as shown in the Figure 4.15.

The third indicator to assess risks related to the real sector is called ICOR (incremental capital-output ratio), i.e. the share of investment in GDP as a percentage of changes in GDP (Figure 4.15). This indicator is normally used to determine the production efficiency of a country⁴¹ and is calculated by dividing the annual investment-GDP ratio by the annual increase in GDP. It can also be considered as the level of investment necessary today to produce an extra unit of output next period. Thus, high values of ICOR are not desirable as they represent low efficiency of investment in production. This was the case in some of the Southeast Asian countries before the 1997 crisis. The high rate of credits to the private sector exerted an additional pressure on the banking sector because of the increasing incidence of bankruptcy during a credit crunch, as it is usually the case at the onset of crises. For the Turkish economy, the recent values of ICOR, which fluctuates between 2.5 to 3.1%, show no sign of a deterioration in the efficiency of investment, as it was the case prior to the global crisis when this ratio doubled from 3 to 6% between mid-2006 and mid-2008.

The final indicator used in this study to assess the real economy is the stock market prices as they reflect developments in the real sector. The ISE-30 and ISE-100 are the stock market indices in Turkey. ISE-100 consists of 100 stocks which are selected among the stocks of companies listed on the National Market and the stocks of real estate investment trusts and venture capital investment trusts listed on the Corporate Products Market. It can therefore be used as a proxy for stock prices. The ISE-30 Index consists of 30 stocks, which are also covered under ISE-100. Because the ISE-30 consists of the biggest 30 companies among all companies traded on the ISE, it may be subject to less speculation than ISE-100, and therefore be a better proxy for stock market returns.

⁴¹ The ICOR loses its feature as indicator of production efficiency for an economy prior to and in the aftermath of crises since it takes very high values due to the low denominator, namely annual GDP growth as well as during the crises when it becomes negative due to negative growth rates.

Figure 4.16 Istanbul Stock Exchange (ISE) Indices (US dollar based closing values)



Source: Istanbul Stock Exchange

The end-of-period quarterly values of the ISE-30 and ISE-100 indices in dollar terms are plotted in Figure 4.16 for the period beginning with 2001. Based on the information in this figure, it is possible to conclude that during the post-global crisis period both indices reached their highest level in the third quarter of 2010, and have shown a tendency to decline until the end of 2011. There is evidence to suggest that the ISE-30 and ISE-100 are leading indicators for the Turkish economy (see Altug and Uluceviz, 2011). Indeed, in the pre-global crisis period, falls in the ISE-30 and ISE-100 typically preceded declines in real GDP growth.

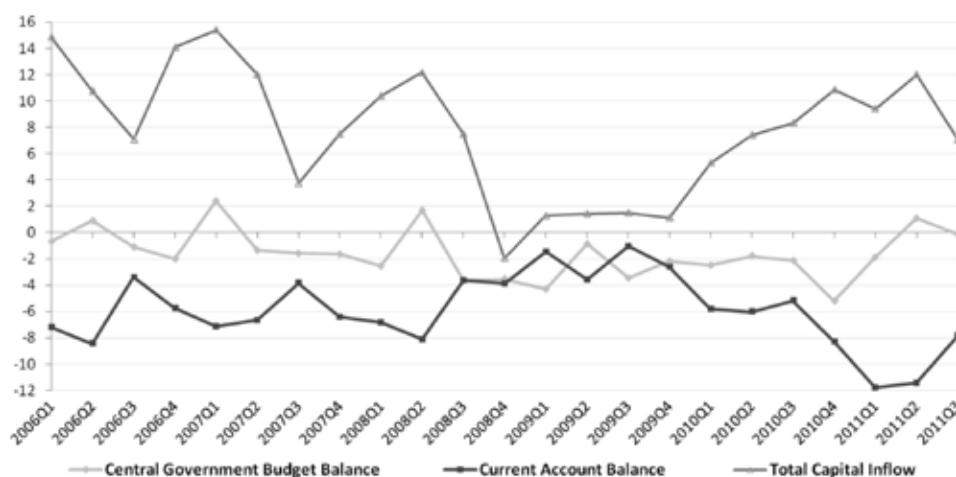
4.7. Fiscal indicators

The first fiscal indicator to examine the risks associated with the fiscal stance of a country is the ratio of budget deficit as percentage of GDP. The first generation models have long pointed out that countries with large budget deficits are more vulnerable to a crisis. The crises of the 1980s, in general, and the Turkish crises of 1990s, in particular, stemmed from fiscal problems and were the products of the expansionary phase of the “populist cycles”, which resulted in the so-called twin deficits, i.e. deficits in both current account and government budget. The 1999 crisis in Russia is also considered as an example of a standard ‘first generation’ financial crisis. Recent developments in Greece show that large budget deficits cannot be maintained forever even in currency unions. Moreover, the

tendency to run large current account deficits has its roots in low domestic savings rates (see Figure 4.23), which partly reflects large budget deficits.

Figure 4.17 depicts central government budget and current account balance as a percentage of GDP, as well as the GDP growth rate compared to the same quarter of the previous year for Turkey. Looking at the performance of the Central Government Budget Balance throughout the period under review, it seems that generally, the Turkish government intends to keep the ratio of budget deficit to GDP below the Maastricht criterion of annual 3%. Indeed, the ratio of budget deficit to GDP is less than 3% on a quarterly basis since 2006, except for the period between the third quarter of 2008 and 2009 and the last quarter of 2010. The increases in the budget deficit in the crisis year are related to the adverse effects of the global crisis and the fiscal stimulus implemented to cope with them. The expansion of the deficit during the last quarter of 2010 seems to indicate the expansionary fiscal policy. Nevertheless, fiscal policy tightening has been observed in the following quarters. Given relatively moderate fiscal deficit in recent years, it seems that Turkish private sector is mainly responsible for the existing large savings-investment gap.

Figure 4.17 Central Government Budget Balance, Current Account and GDP Growth (%)

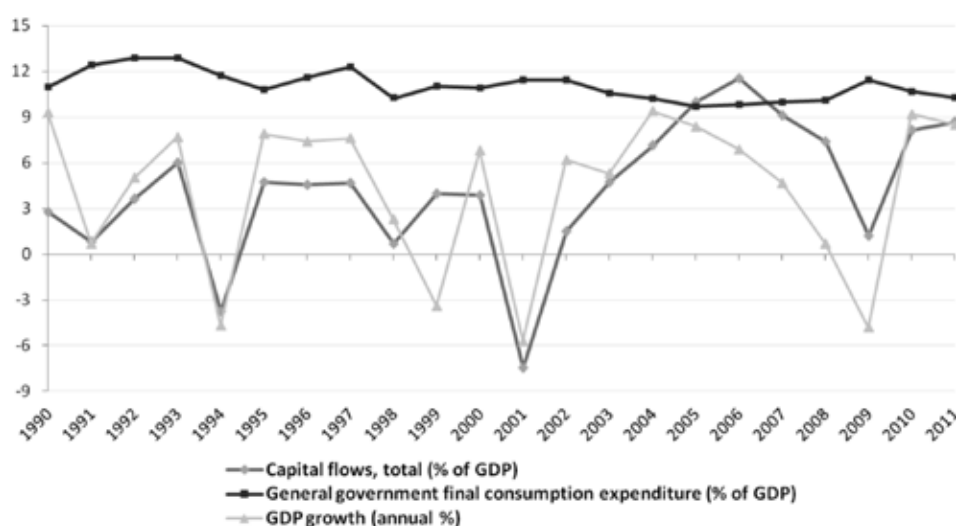


Source: Central Bank of Turkey, OECD

Fiscal policy pro-cyclicality is the second fiscal indicator to assess country risk related potential fiscal misalignments. Kaminsky, Reinhart, and Vegh (2004) find an unambiguous pattern of pro-cyclical fiscal behaviour in middle and low income countries, such that the cyclical components of GDP, net capital flows and real fiscal spending all reinforce each other. Periods of cyclically high capital inflows are associated with an expansion in real

government spending –fiscal policy is pro-cyclical both in relation to output and capital inflows. When the economic downturn comes, the necessary fiscal tightening is larger than ‘desirable’ by the government– the swing in real fiscal spending during the cycle boom and bust can be as large as 25 to 35 percentage points according to Kaminsky *et al* (2004). Two proxies are used to measure fiscal policy pro-cyclicality. The first proxy is the correlation between general government final consumption expenditures and private capital inflows, both as percentage of GDP, and GDP growth itself.

**Figure 4.18 General Government Final Consumption Expenditures
Total Capital Inflows (as % GDP) and GDP Growth (%)**



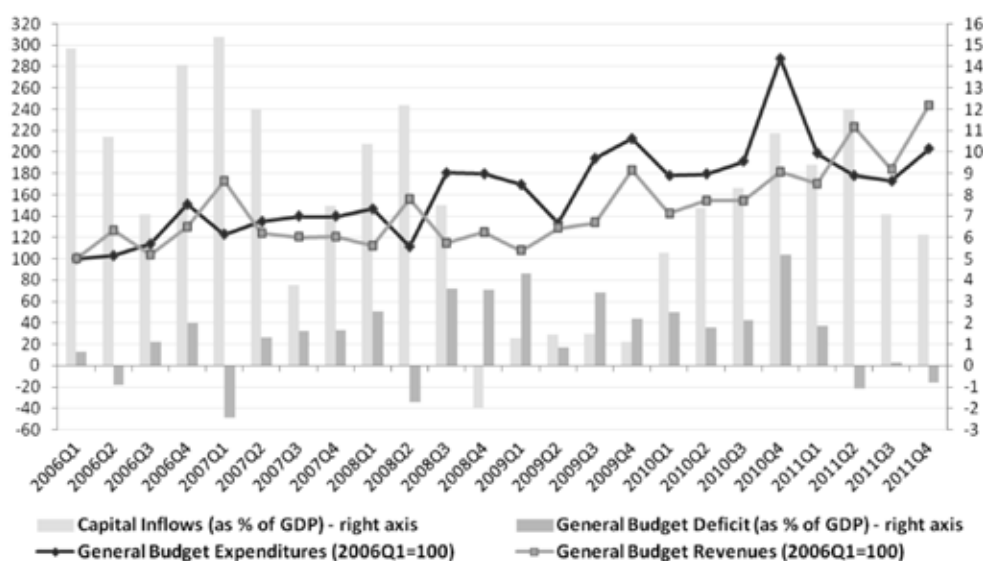
Source: Central Bank of Turkey

Note: Total capital inflow is taken as the sum of Turkey's Liabilities in Financial Account plus Net Errors and Omissions of Balance of Payments Statistics

Figure 4.18 shows that there is some evidence that fiscal policy in Turkey is pro-cyclical between the years 1990 and 2000, in the sense that it swings in accordance with total capital inflows. However, in the aftermath of the 2001 crisis, this correlation does not exist anymore. From Figure 4.18, we observe that although total capital inflows reached much higher levels during 2003-08 compared to that of 1992-94, there was not an increase in the ratio of general government final consumption expenditures to GDP during 2003-08, unlike the 1992-1994 period. As evidenced by the experience in 2009, due to the fiscal stimulus associated with the global financial crisis, general government final consumption expenditures increased when capital inflows and the GDP growth rate fell, implying a countercyclical stance to fiscal policy. Furthermore, in line with this policy stance, government expenditures fell in 2010 and 2011, when GDP growth of 9.2% and 8.5%, respectively, and robust capital inflows were observed.

The second proxy related to the fiscal policy pro-cyclicality is the government budget balance, with revenues and expenditures indexed to 4 years prior to the surge in capital flows. Reinhart and Reinhart (2008) document that government expenditures increases from 2 years prior to the year of capital flow bonanzas rises by about 20 percent in real terms at a time during which growth is accelerating. Despite even faster growth in government revenues than in expenditures, the fiscal balance deteriorates markedly into the bonanza year, because, while revenues are growing more rapidly, they are doing so from a lower base than expenditures 4 years prior to the bonanza. Since the data on central government budget revenues are available only from 2006 and onwards for Turkey, it is not possible to apply the method proposed by Reinhart and Reinhart (2008) to Turkey.

Figure 4.19 General Government Final Consumption Expenditures and Revenues (2006Q1=100) and Total Capital Inflows (as % GDP)



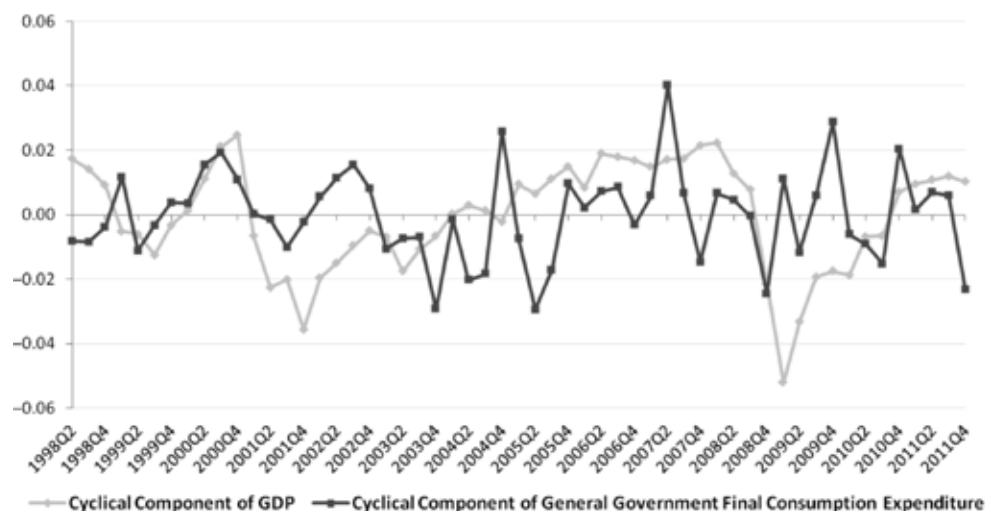
Source: Central Bank of Turkey

However, Figure 4.19, which plots general government expenditures and revenues (both indexed to the first quarter of 2006), as well as budget deficit and total capital inflows (both as percentage of GDP), shows that the fiscal balance does not deteriorate in “bonanza” years in Turkey. Instead, the budget balance improves, and even turns positive at times of high capital inflow, as it is the case in 2007 Q1, 2008 Q2, and lately in 2011 Q2. To a great extent, this may be attributable to the high share of indirect taxes in Turkey’s budget revenues, which increase during booms in economic activity,

The final proxy related to the fiscal policy pro-cyclicality indicator is the correlation between the cyclical components of GDP and fiscal spending. Figure 4.19 shows the cyclical

component of seasonally adjusted quarterly real GDP and that of real fiscal spending obtained by decomposing the trend and cyclical part of both using the HP filter.

Figure 4.20 Cyclical Components of Seasonally Adjusted Real GDP and Fiscal Spending

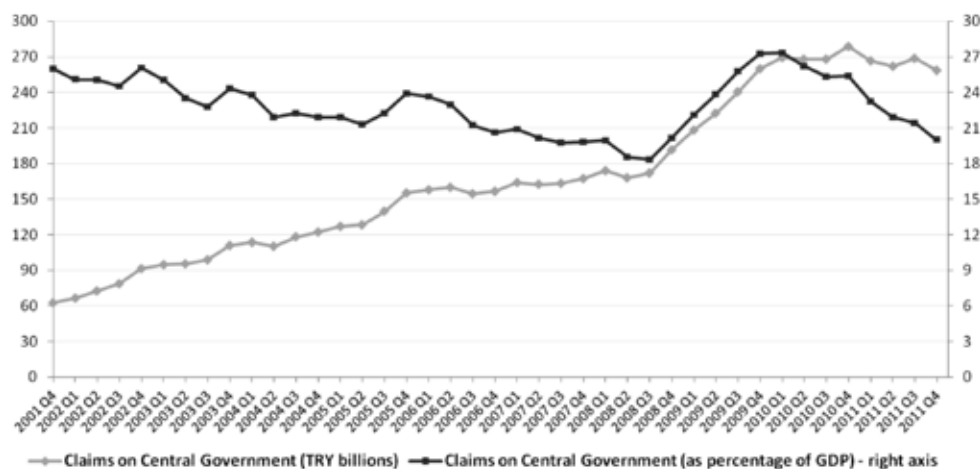


Source: OECD

Between 1999 and 2003, the cyclical components of real GDP and real fiscal spending seem to reinforce each other; however there is no evidence of fiscal policy pro-cyclicality thereafter except for 2010Q3, when fiscal spending shows a temporary rise. During the post-2001 crisis era, the cyclical component of government expenditures deviates most from the trend value in the last quarter of 2004, second quarter of 2007, first and last quarters of 2009, as well as the last quarter of 2010. Though there is no apparent explanation for the first surge, the reason for the second and third spikes seems to be political as two elections (either local or general) were held in July 2007 and March 2009, respectively. While the expenditure spike in 2009Q4 is due to the fiscal stimulus measures taken against the collapse of domestic demand during the global crisis, the final spike in 2010Q4 has no apparent reason.

The third fiscal indicator to assess the risk associated with the fiscal stance of a country is the credits to the public sector as a ratio of GDP, because high public sector indebtedness increases perceptions of a default risk. Because of a lower perception of wasteful spending, lower levels of public debt, encourage capital inflows. Figure 4.21 shows the claims on central government of Turkey, both in billions of TRY and as percentage of GDP.

Figure 4.21 Claims on Central Government (in TRY billions and as % GDP)

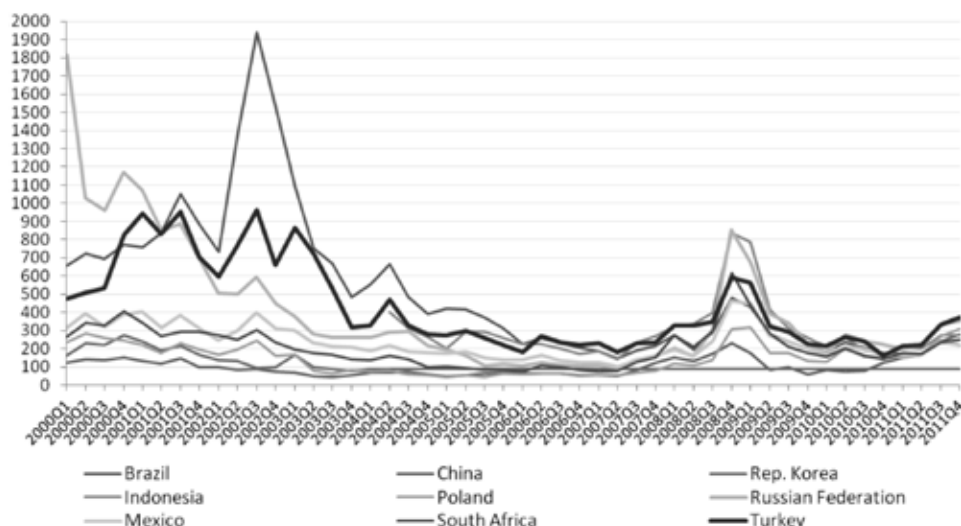


Source: IFS

It is possible to deduce from Figure 4.21 that there are three different phases related to the behaviour of the claims on the central government. The first phase starts in the last quarter of 2001 and ends with the outburst of the global crisis. During this phase the claims on the central government increase steadily in TRY terms but decline from 26% to 18% as percentage of GDP. In the second phase which coincides with the global crisis period, the claims on the central government increase both in absolute terms and as a ratio until the first quarter of 2010. In the last phase, the claims on the central government stay stable in TRY terms while their ratio to GDP falls from 27 to 20% at the end of 2011. These developments together with the fact that the world average on claims on central government reached 25% (WDI Online) in 2010 imply that Turkey follows fairly sound fiscal policies at least since the 2001 crisis and there seems to be no apparent risk associated with the fiscal stance of Turkey.

Figure 4.22 shows the end-of-quarter sovereign bond interest rate spreads (as basis points over US treasuries) for Turkey and other emerging economies since 2000. In short, the sovereign bond interest rate spread can be thought as a price of insurance against government default. Increases in sovereign bond interest rate spreads indicate that the market's perception of credit risk has risen. Since the contracts pay off only as long as the seller of protection itself is solvent, sovereign bond interest rate spreads contain information about the probability of joint default of both the bond issuer and the protection seller.

Figure 4.22 Sovereign Bond Interest Rate Spreads (basis points over US Treasuries)

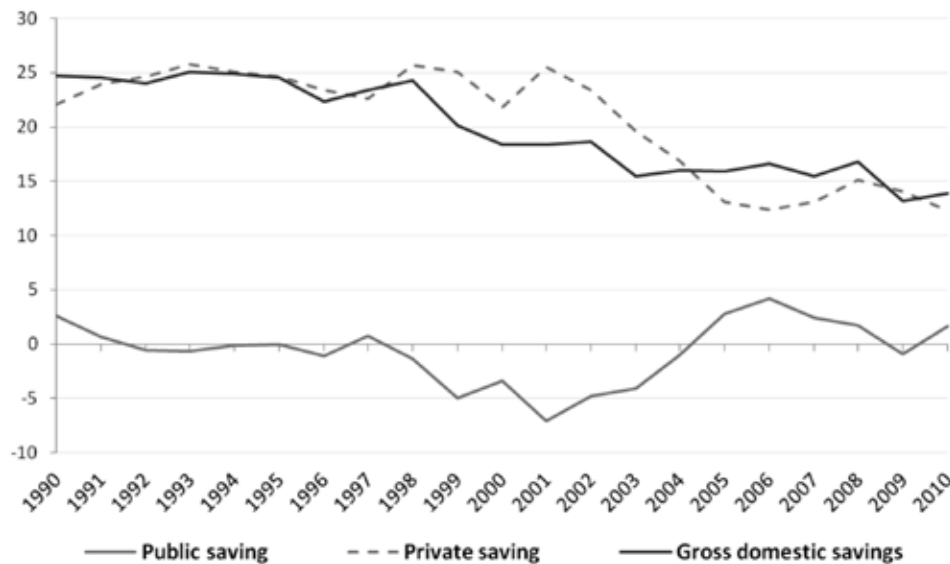


Source: World Bank, Global Economic Monitor Database

The presented data shows that with 373 basis points in 2011Q4, Turkey has the highest spread among the emerging markets examined. In fact, throughout the period starting from 2000, Turkey has one of the highest sovereign bond interest rate spreads. Though the highest spread at the beginning of the period belongs to Russia; it falls rapidly and stays at low levels except for the global crisis period. Indonesia is the other country with a spread higher than that of Turkey during the global crisis. Brazil's spread after the hike in 2002 as a result of the fears related to the policies of the new president, surpasses that of Turkey until 2006, but stays lower afterwards. In sum, Turkey is the country with the highest risk, especially lately, amongst the emerging markets as reflected in the sovereign bond interest rate spreads. However, since the other fiscal indicators do not imply a risk for Turkey, the latest surge in sovereign bond interest rate spreads is perhaps related to the currency risk rather than fiscal risks.

Finally, Figure 4.23 gives the shares of savings in GDP to examine the risks associated with the fiscal stance of Turkey. Since the tendency to run large current account deficits has its roots in low domestic savings rates, which may reflect large budget deficits. Figure 4.23 shows that gross domestic savings as percentage of GDP have a tendency to decline since 1998. However, the main reason behind this is not the decline in the public saving, but that of the private saving, which has fallen from 25% to around 12% as percentage of GDP during 2001-2006 and fluctuates around the latter since then.

Figure 4.23 The Share of Savings in GDP (%)



Source: Ministry of Development of Turkey

4.8. Results of the Analysis Based on the Quarterly Data

In this section, seven groups of indicators identified by the literature to evaluate vulnerabilities in an economy are overviewed and preliminary analysis for Turkey based on the quarterly data is performed. The first group, which comprises the indicators related to current account balance and the real exchange rate, points to vulnerabilities for Turkey, especially after the second half of 2010. The correction seems to have started in November 2010 with the depreciation of the exchange rate, which has been followed by a slight improvement in the current account balance.

With respect to the financial account, which is the second vulnerability indicator in this study, it is possible to deduce that changes in the nature of capital inflows in the aftermath of the 2008-09 crisis increase the vulnerability of the Turkish economy. The reason is that capital inflows during this period comprised mainly of portfolio and other investment inflows, in contrast to the pre-crisis period, during which the share of FDI was higher. Nonetheless if the surge in FDI observed in the second half of 2011 continues, the vulnerabilities in the Turkish economy related to the composition of capital inflows may decrease.

Among the liquidity indicators, the ones related to the need for funds in the short-run indicate some vulnerability for the Turkish economy. In particular, the short-term external

debt to reserves ratio exceeded the safe level of 100% as of 2011Q3. Similarly, total debt service as percentage of exports, which is 37% as of 2010, is high, but there is no reason to be concerned about public and publicly guaranteed external debt service. A rise in interest rates in developed economies (LIBOR), thus the risk of capital flight, seems to be low as well -at least in the short run- due the slow recovery in the US and the ongoing debt crisis in the EU.

Solvency indicators, which are related to the capacity of a country to pay its external debt, in general do not signal vulnerability to a crisis for Turkey. The ratio of total external debt to GDP ratio has been stabilized around 40% since the last quarter of 2006 and the ratio of foreign exchange reserves to external debt fluctuates in a narrow band since 2005. However, the net international investment position to GDP ratio that reached 50.4% in the first quarter of 2011, signal a vulnerability of the Turkish economy to a solvency-type crisis. As a matter of fact, the recent decrease in this ratio to 43.4% as of end-2011 reflects that some adjustment in IIP of Turkey has already started.

The first indicator related to financial risks in Turkey, namely, the annual expansion of banking claims on the private sector as a percentage of GDP, reached 14.5 percent in the third quarter of 2011. Though this is one of the highest ratios observed in Turkey, it is below the ratios experienced in the pre-crisis periods of the other emerging economies. Furthermore, it fell to 12 percent as of end 2011. For the second financial indicator, which is the currency mismatch, both of the two proxies (the ratio of financial sector's foreign liabilities to banking sector's domestic loans and the percentage share of foreign exchange deposits in M2Y) scrutinized in this study imply no apparent currency mismatch.

Among the indicators used in this study to assess risks related to the real sector, the first one is the behaviour of the real GDP. Crises are likely to occur as the economy enters a recession following a prolonged boom in economic activity, but the post-global crisis growth in the Turkish economy did not last that long although very high growth rates observed since the beginning of 2010. The other two indicators show no sign of vulnerability in the real sector: First, the ratio of investment expenditures to GDP, though reaching a record high of more than 26% as of the third quarter of 2011, is below the 'safe' threshold level of 40% estimated in the financial crisis literature. Second, the ICOR (incremental capital-output ratio) has fluctuated between 2.5 to 3% recently, which is lower than the 6% observed at the onset of the global crisis. Thus, as of end 2011, there is no sign of deterioration in the efficiency of investment. Finally, the stock market indices, which are considered as leading indicators for the Turkish economy, declined for the period between the third quarter of 2010 and the end of 2011. The tendency for the stock market indices to decline seems to have been reversed since then, implying a decrease in the overall vulnerability of the Turkish real sector.

The last group of indicators analyzed in this section relates to the fiscal aspect of the economy. The first fiscal indicator scrutinized is the budget deficit as percentage of GDP. Unlike in the pre-2001 crisis period, the vulnerability of the Turkish economy to a crisis due to budgetary imbalances is not a matter of concern during the last decade. The second fiscal indicator to assess country risk related to fiscal misalignments is the fiscal policy pro-cyclicality, meaning that the cyclical components of GDP, net capital flows and real fiscal spending all reinforce each other. We used two proxies for fiscal policy pro-cyclicality, the first of which is the correlation between general government final consumption expenditures and private capital inflows, both as percentage of GDP, and the GDP growth itself. There is no evidence that Turkish fiscal policy is pro-cyclical in the sense that it swings in accordance with private capital inflows after 2001 crisis, contrary to the pre-crisis period. Furthermore, there is evidence that fiscal policy becomes countercyclical in the aftermath of the global crisis, as sound fiscal policies imply. The second proxy used for measuring fiscal policy pro-cyclicality is the government budget balance, with revenues and expenditures indexed to the first quarter of 2006. Unlike evidence found for the low and middle income countries in the literature, the fiscal balance does not deteriorate in “bonanza” years for Turkey. Instead the budget balance improves, and even turns positive at times of high capital inflows. This may be attributable to the high share of indirect taxes in Turkey’s budget revenues, which increases during booms in economic activity as mentioned before. The third fiscal indicator to evaluate fiscal policy stance is the claims on the central government as percentage of GDP. The developments in this indicator through time and with respect to the world average imply that Turkey follows sound fiscal policies at least since the 2001 crisis. The final indicator related to the fiscal aspect is the sovereign bond interest rate spreads. The latest data on sovereign bond interest rate spreads reveal that Turkey is the country with the highest risk amongst the emerging markets. However, since the other fiscal indicators do not imply a risk for Turkey, the latest surge in sovereign bond interest rate spreads is likely to reflect the currency risk rather than fiscal risks. To sum up, the results of the quarterly data analysis carried out in this section point out that some vulnerability exists in the Turkish economy. Further evaluation is however required. This is the goal of the next section.

SECTION 5

EARLY WARNING ANALYSIS

The unique nature of each crisis and the fact that any econometric analysis requires extensive datasets makes any formal analysis aimed at predicting financial crashes extremely difficult. For this reason, economic research has moved away from models that attempt to forecast the timing of crises (Rose and Spiegel, 2010). For example, the recent ‘Early Warning Exercise’ (EWE) conducted jointly by the IMF and FSB (2010) relies on empirical analysis, which aims at assessing system-wide risks that predispose economies to crises instead of trying to predict triggers of such events. Even if such analysis fails to predict the exact occurrence of crises, it allows policy-makers to take corrective measures to avoid them or diminish their consequences. Therefore, in this section, we follow recent trends in the literature and use an early warning exercise as a diagnostic tool to analyze vulnerabilities existing in the Turkish economy⁴².

In what follows, the signal analysis à la Kaminsky, Lizondo, Reinhart (KLR) (1998) is conducted⁴³. Although, KLR apply the signal analysis to a number of countries, as pointed out by Edison (2003), an early warning exercise can also be applied to an individual economy with a similar degree of success. The idea behind this approach is to look at the behaviour of selected economic and financial indicators, which can be or previously were associated with incidents of crises. The selection of these indicators is guided by the fact that they should be broad enough to be able to identify a wide range of possible vulnerabilities existing in the economy. The approach is univariate in that each variable is analyzed separately.

It should be mentioned that some of the indicators chosen for the vulnerability analysis carried on in the previous section could not be analyzed here due to the lack of monthly data (e.g. fiscal indicators). For this reason and in order to be able to perform various sensitivity checks (see below), indicators selected for the early warning exercise mostly correspond to indicators analyzed in the KLR as well as Edison studies. Five additional indicators are also analyzed as they seem to be relevant for the recent developments in the Turkish economy. The indicators calculated and discussed in this part of the study are listed in the next section and can also be found in Table A.2, Appendix 2.

To identify past crises occurring in Turkey after 2001, and to monitor the speculative exchange rate market pressures, a model-independent Exchange Market Pressure (EMP) index is calculated following Eichengreen et al. (1996). Specifically, the EMP index is a weighted average of changes in the exchange rate, in international reserves, and nominal

⁴² The analysis focuses on macroeconomic and macro-financial vulnerabilities. The potential vulnerabilities related to regulatory issues in the financial sector are beyond the scope of this paper.

⁴³ A modified signal approach can also be found, among others, in works of Bruggemann and Linne (2002) or Edison (2003) or Frankel and Saravelos (2010).

interest rates. The EMP in period t is calculated as follows:

$$EMP_t = \alpha \% \Delta e + \beta \Delta (\dot{i} - \dot{i}^*) - \gamma (\% \Delta r - \% \Delta r^*)$$

where α , β and γ are the weights, which are the inverse of the standard deviations of e_t , $(\dot{i}_t - \dot{i}_t^*)$, and $(r_t - r_t^*)$, respectively. They are used to equalize the volatilities of the three components and to prevent the component with the highest volatility from dominating the index. Δ denotes monthly percentage change.

The pressure increases as the exchange rate depreciates; reserves deplete or interest rates go up. As discussed by Eichengreen et al (1996), who use quarterly data, this type of index overcomes problems related to structural models of exchange rate determination, i.e., their failure to predict the exchange rate movements in the short run, and it is applicable under all exchange rate regimes. Given the floating exchange rate regime in Turkey, which is accompanied by an inflation targeting monetary regime, the above specification of the EMP index needs to be modified twice. First, the EMP index is simply calculated as⁴⁴:

$$EMP_t = \% \Delta e$$

Second, since, the Turkish Central Bank has been increasing reserves to manage large capital flows during the period from mid-2010 to mid-2011 (IMF, 2011), a different form of the index is calculated (see Edison, 2003)⁴⁵:

$$EMP_t = \% \Delta e - \alpha (\% \Delta r)$$

where $\alpha = \sigma_e / \sigma_r$ and where σ_e is the standard deviation of the rate of change of the exchange rate and σ_r is the standard deviation of the rate of change of reserves.

⁴⁴ The term “exchange rate crisis” is used in the literature in reference to fixed or semi-fixed exchange rate regimes that are abandoned following a shock or as a result of pre-existing imbalances. This is why, in this paper the expression “large depreciation” is used instead, as Turkey has a floating exchange rate regime since 2001.

⁴⁵ In the case of a dirty/managed float exchange rate regime (de jure but not de facto floating), the change in the exchange rate may not sufficiently reflect the exchange rate market pressure. In this case, the attempted speculative attacks on the exchange rate will be reflected through actions taken by the central bank. In order to maintain liquidity, monetary authorities can use international reserves to finance external payments imbalances, support the value of domestic currency, or help domestic companies whose balance sheets are highly exposed to a currency depreciation to close their positions. Also, in many empirical studies on financial crisis, exchange rate changes have often been combined with movements in reserves to create indices of exchange market pressure that measure crisis intensity regardless of exchange rate regime (Sachs, Tornell and Velasco, 1996; Corsetti, et al, 1998; Fratzcher, 1998; KLR, 1998; Berg and Pattillo, 1999; Tornell, 1999; Bussiere and Mulder, 1999, 2000; Collins, 2001; and Frankel and Wei, 2005).

In both cases, a crisis episode is defined as an unusually rapid increase in the index, i.e., following Eichengreen *et al.* (1996), a crisis is defined as taking place when the EMP index exceeds its threshold value. The benchmark thresholds are set to be 1.5 standard deviations (S.D.) above the entire sample mean. Formally:

$$\text{Crisis} = 1 \text{ if } EMP_t > \mu_{EMP} + 1.5\sigma_{EMP}$$

Crisis = 0 otherwise,

The respective threshold values for signalling indicators previously associated with incidents of crises are calculated in a similar manner. Since, for some indicators low values signal vulnerability to crisis whereas for others high values mark crisis susceptibility, an indicator is believed to send a warning signal if its value is greater *in absolute terms* than 1.5 S.D. of the entire sample's average value for this indicator. A variable that exceeds its threshold is assumed to signal a crisis within the next 24 months⁴⁶.

Given the sample dependence of this approach, a sensitivity analysis is performed. First, critical regions calculated by Edison (2003) based on the pooled information are used to determine 'optimal' thresholds for each indicator calculated for Turkey⁴⁷. The choice of Edison's over KLR's critical regions is due to the fact that Edison extends the KLR sample by including more emerging economies, thus making it more relevant for the Turkish case. Furthermore, the thresholds on the calm period in the Turkish economy are calculated, i.e. a threshold value of an indicator is set to be plus/minus 1.5 S.D. of the calm sample average (2003-2007) of that indicator. Second, the sensitivity analysis with respect to the benchmark thresholds for the EMP indices is conducted. The thresholds based on the calm period 2003-2007 are also calculated. Additionally, following Edison (2003), 2.5 S.D. thresholds above the entire sample averages are also tried.

⁴⁶ As discussed, this study does not attempt to predict the timing of the crisis. However, a 24-month period is used to assess the potential for crisis or increased vulnerability.

⁴⁷ To determine the pooled sample critical regions, Edison (2003) follows KLR (1998) and uses a grid search to minimize the noise-to-signal ratio. The noise-to-signal ratio is calculated by dividing the number of months during which the variable signals a crisis incorrectly (false alarm or noise is issued) by the number of months during which a crisis is signalled correctly. The thresholds calculated for Turkey based on Edison's critical regions are presented in Table A.2, Appendix 2.

5.1. Results of the Early Warning Analysis

This section calculates fifteen warning indicators analysed in the KLR (1998) and Edison (2003) as well as five additional indicators which are not considered by these papers to assess Turkey's external vulnerabilities. The selected warning indicators are known to perform reasonably well in predicting past crises. They can be broadly classified into four categories:

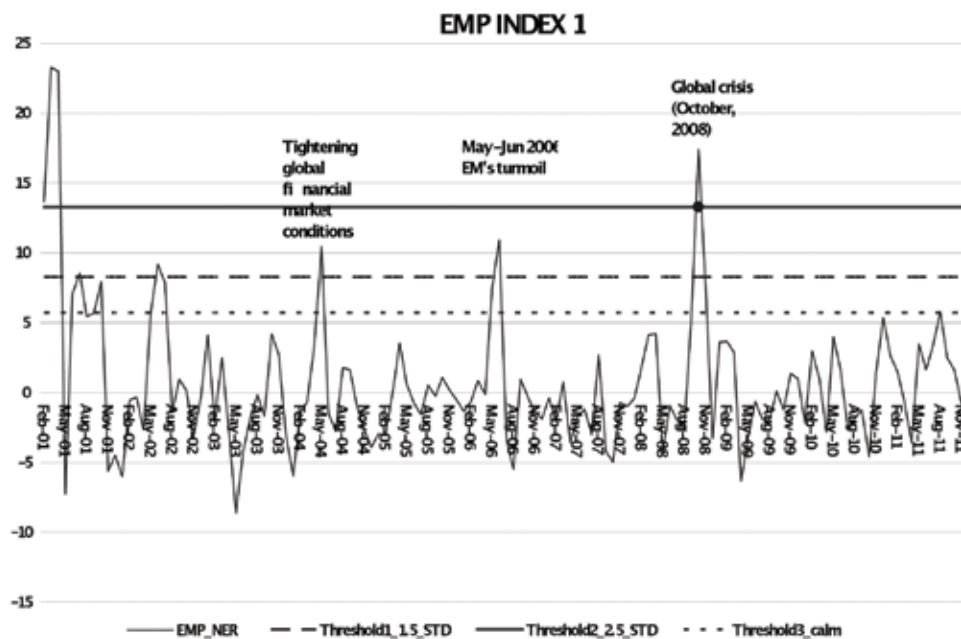
- external indicators (the real exchange rate, the current account to GDP ratio, export growth, import growth, the terms of trade);
- indicators related to the capital account (growth in reserves, interest rate differential, the level and annual growth of the ratio of short-term debt to reserves as well as the annual growth of the ratio of short-term debt to GDP);
- financial indicators (the annual change and the level of M2 to reserves ratio, the M2 multiplier, claims on the private sector to GDP ratio, foreign exchange deposits to broad money M2 ratio, real credit growth, loans-to-deposits ratio, the real interest rate);
- real indicators (industrial production growth rate, stock market prices).

The detailed information on each particular indicator (its transformation, tail of the distribution examined, size of the critical region, and thresholds) can be found in Table A.2, Appendix 2⁴⁸.

The Early Warning exercise is performed on the monthly data for the January 2001-September/November 2011 period. To identify past crises and zones of vulnerabilities in Turkey, the EMP variables are plotted against time. The horizontal lines indicate the calculated threshold values; when an EMP index exceeds one of the threshold values, it is interpreted as a crisis incidence (or zone of vulnerability). Figures 5.1 and 5.2 illustrate the movements of the two EMP indices calculated in the study. Looking at the movements of the EMP Index 1 (Figure 5.1), which is computed as the change in nominal exchange rate only, it is clear that the thresholds 1 and 2 overestimate the number of financial crises experienced by Turkey, but correctly pick up speculative market pressures.

⁴⁸ Since Edison (2003) does not include terms-of-trade (TOT) in his study, and since KLR (1998) do not provide information on the size of the critical region for this variable in their paper, the size of the critical region as well as the noise-to-signal ratio for the TOT indicator are taken from Kaminsky (1998).

Figure 5.1 Exchange Market Pressure Index: Monthly changes in the nominal exchange rate

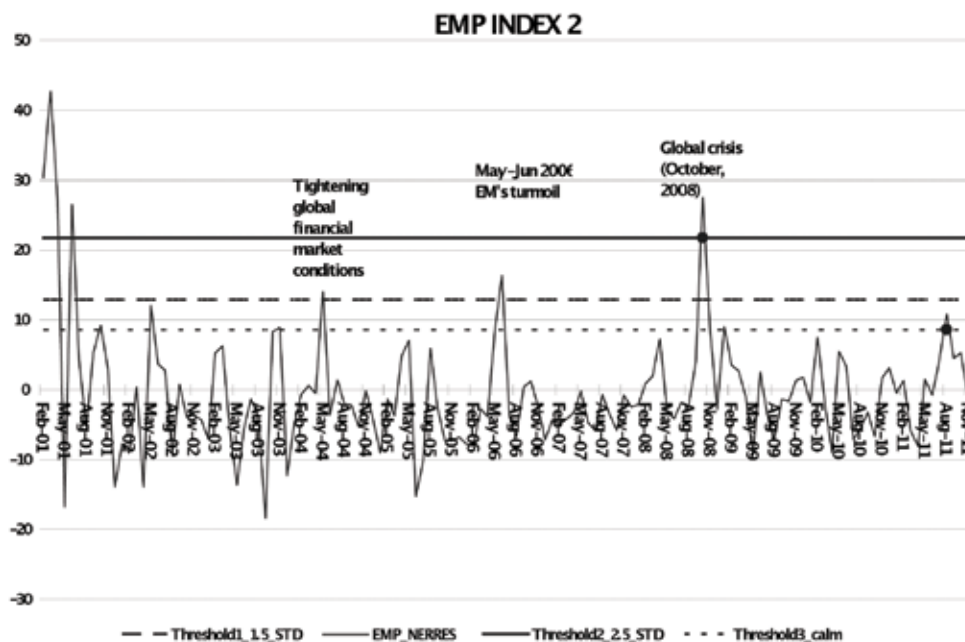


Note: Own calculation based on the Central Bank of the Republic of Turkey (CBRT) data. 'Threshold1' and 'Threshold2' represent thresholds calculated as the sample mean plus 1.5 S.D and 2.5 S.D, respectively. 'Threshold3' is calculated as 1.5. S.D above the calm sample average (2003M1-2011M11).

The threshold calculated as 2.5 standard deviations above the mean performs best in terms of identifying the financial crises only, i.e. it picks up the two actual crises experienced by Turkey: one accumulating in February 2001 and the other in October 2008. Looking at the recent developments, the Turkish lira seems to be undergoing more speculative market pressures as movements in the index clearly exceed the calm period average.

The developments in the EMP Index 2 calculated as a weighted sum of monthly changes in the nominal exchange rate and changes in reserves are similar (Figure 5.2). The threshold which does not overestimate the number of actual crashes in Turkey is 2.5 standard deviations above the mean. Recent pressures observed in the exchange rate market are again picked up by the threshold obtained from the calm period of nominal exchange rate and reserves movements (i.e. the EMP index 2 crossed Threshold 3 in August 2011).

Figure 5.2 Exchange Market Pressure Index: Weighted sum of monthly changes in the nominal exchange rate and reserves



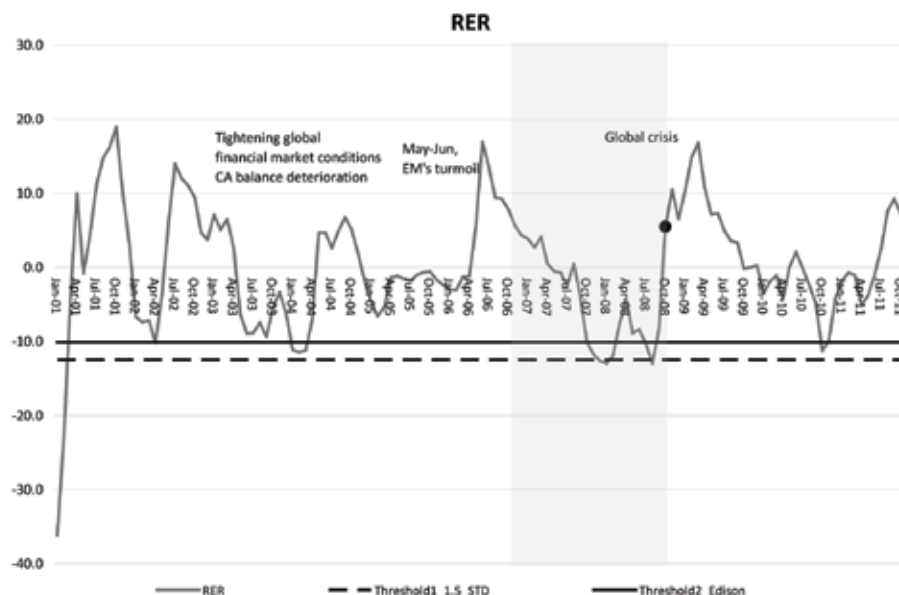
Note: Own calculation based on the CBRT data. 'Threshold1' and Threshold2' represent thresholds calculated as the sample mean plus 1.5 S.D and 2.5 S.D, respectively. 'Threshold3' is calculated as 1.5. S.D above the calm sample average (2003M1-2011M11).

In what follows, the performance of selected economic and financial signalling indicators for Turkey is evaluated. As in the case of the EMP indices, the evolution of the individual indicators is presented for the period between January 2001 and September 2011. Each indicator, except for the deviation of the real exchange rate from trend (in percentage terms), and the interest rate variables (in percentage terms), is calculated as the annual percentage change in the level of the variable (see Table A2.1, Annex 2). As before, the horizontal lines determine thresholds. This time, when an indicator exceeds the threshold value, it is interpreted as a warning signal, i.e. a signal that the economy is vulnerable to a crisis in the near future.

The analysis starts with the examination of the sustainability of the current account in Turkey. Five indicators are looked at: deviations of the real exchange rate from the trend, current account to GDP ratio, and growth rates of exports, imports and the terms-of-trade. Since real appreciation of a currency may result in loss of international competitiveness, thus worsening in the current account, it can increase expectations of future exchange rate adjustments. If the real exchange rate appreciation leads to a misaligned currency value,

the current account deficit may be less sustainable. The perception that a currency is overvalued combined with a large current account deficit may lead to a balance of payments type of crisis (see Jakubik, 2000). Indeed, according to Frankel and Saravelos (2010), past movements in the real effective exchange rate, were one of the most statistically significant predictors of currency crisis (including the 2008 global crisis).

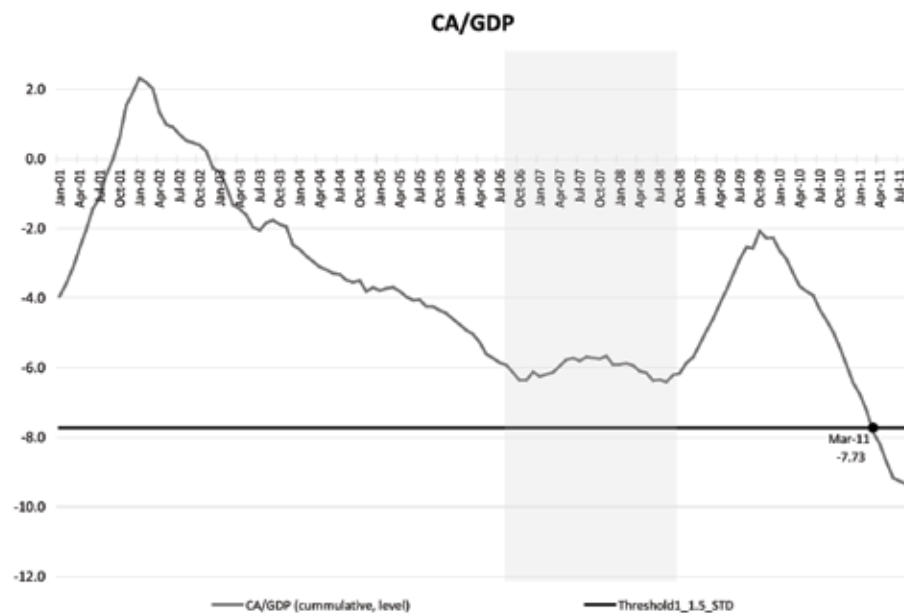
Figure 5.3 Real Exchange Rate: deviations from the trend



Note: Own calculation based on the CBRT data. HP filter was used to calculate deviations from the trend. Lambda, the smoothing parameter, was set equal to 14400. 'Threshold1' was calculated as the sample mean plus 1.5 S.D. 'Threshold2' was calculated based on Edison's critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

Given that the calm period threshold turned to be very similar in value to the threshold calculated in accordance with Edison's (2003) percentiles, only two threshold values are presented for the RER indicator (Figure 5.3). Both thresholds are lower bound thresholds as real exchange rate over-valuations (-) are linked to currency crisis. The RER indicator correctly predicts the 2001 and 2008 crises in Turkey (signals are sent a few months before the major currency devaluation/ depreciation). However, Threshold 2 incorrectly picks up the tight market conditions present in 2004, which did not turn into a full-blown crisis. Therefore, the signal sent in October 2010 may be misleading. Nevertheless, it is clear that as the market became nervous about the possible overvaluation of the nominal exchange rate, the depreciation of the currency and corrections in the RER were observed.

Figure 5.4 Current account (level, cumulative values)



Note: Own calculation based on the CBRT data. Monthly values of short-term debt (STD) and GDP were interpolated from quarterly data. CA/GDP values are annual cumulative sums. Monthly GDP was interpolated from quarterly (see Table A2.1 in Appendix 2). ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D.

Although the ratio of current account to GDP was not a part of the KLR or Edison analysis, it seems to be relevant for the Turkish case given its large CA deterioration in recent months⁴⁹. Since the pooled sample critical values are not available for this indicator, the threshold value was calculated based on its deviation from the mean (plus 1.5 S.D). It is clear that the CA/GDP indicator does not send warning signals before the 2008 crisis (Figure 5.4). In fact, the level of CA to GDP remained fairly stable in months preceding the crisis. The only conclusion one can draw from this figure is that the CA/GDP ratio is at its historical high as of the latest period analyzed in Figure 5.4 (in absolute terms) and by far exceeds the warning threshold.

⁴⁹ This variable was analyzed in many other studies, including the study by Frankel and Saravelos (2010), and performed well.

Figure 5.5 Export growth (y-o-y)

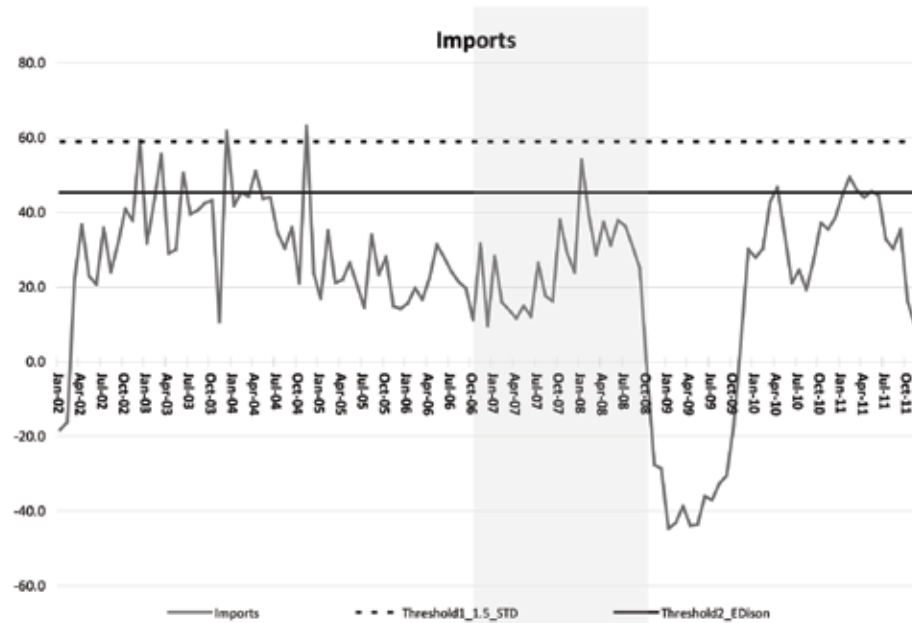


Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

In the Edison’s (2003) study, slowdown in exports is one of the three top performing crisis indicators (others are changes in short-term debt to reserves ratio and equity prices). Looking at 12-month changes in export growth in Turkey (Figure 5.5), it is clear that there was a collapse in exports associated with the 2008 recession. Exports also drop after the 2001 crisis, but quickly picked up thereafter (which is not surprising given the large currency devaluation). As a warning indicator, the export growth variable does not perform well in the case of Turkey, i.e. it fails to send a signal before the 2008 crash. Recently, export changes are also above the thresholds, signalling no reason to be alert.

Developments in imports are different (Figure 5.6). Changes in imports correctly send alerts before the 2008 crisis, but the indicator seems to over-predict the number of crises in Turkey (it sends alerts around 2004 where global market conditions tightened, but no financial crisis occurred).

Figure 5.6 Import growth (y-o-y)

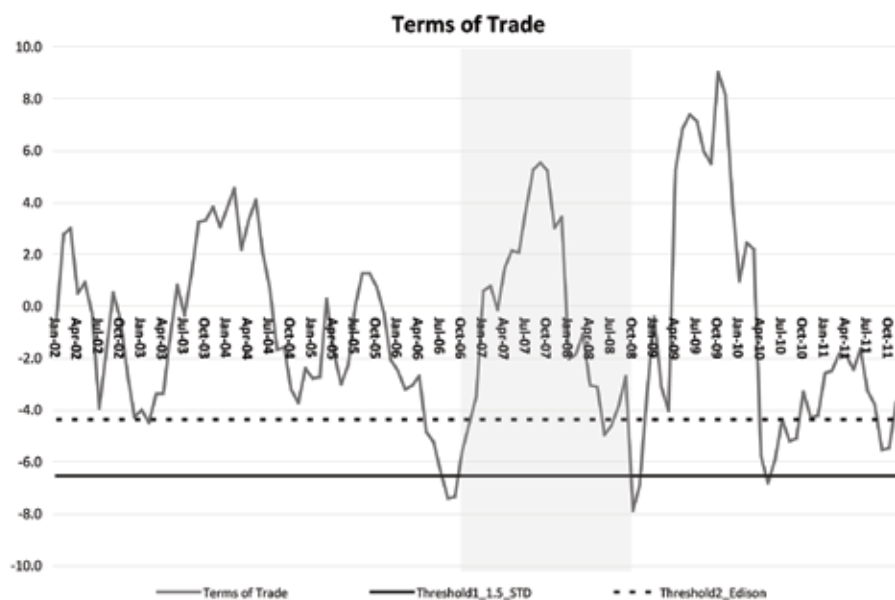


Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

Finally, the terms of trade (TOT) indicator is discussed (Figure 5.7). In general, this indicator is not known to perform as well as import or export indicators in signalling crises (see Frankel and Saravelos, 2010). Nevertheless, TOT deteriorations did positively signal the 2008 turmoil according to Frankel and Saravelos (2010) study even if the TOT indicator was not positioned as high as other indicators related to countries’ external position.

Looking at Figure 5.7, movements in TOT correctly pick up the 2008 financial turmoil in Turkey and also send some warning signals more recently (in April, May and July 2010 and then again in September and November 2011).

Figure 5.7 Terms-of-trade (y-o-y)



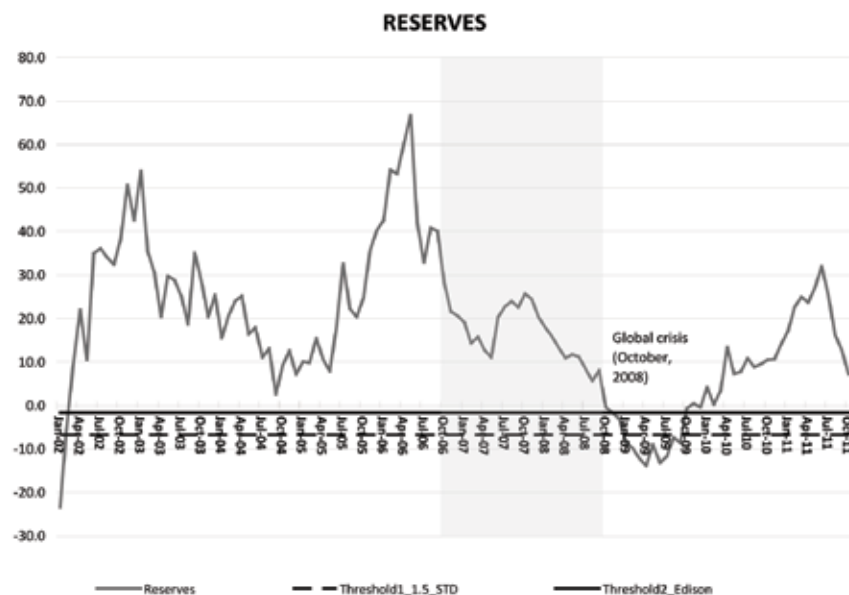
Note: Own calculation based on the WB data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

The next five indicators (growth in reserves, interest rate differential, the level and growth of the ratio of short-term debt to reserves as well as the ratio of short-term debt to GDP) reflect developments in the Turkish capital account⁵⁰.

The indicator reflecting changes in the stock of reserves is presented in Figure 5.8. Although, the calculated thresholds 1 and 2 were able to detect the October 2008 crisis, they failed to send warning signals prior to the event. Nevertheless, the stock of reserves was growing at a diminishing pace since late 2007. With respect to recent developments, no signal has been issued. Similar to the situation prior to the 2008 crisis, the growth of reserves has been slowing since mid-2011.

⁵⁰ Capital account is referred to as financial account in Chapters 3 and 4 following the terminology used in Balance of Payments Statistics of CBRT. Here, the term “capital account” is used in line with the literature on financial crises.

Figure 5.8 Monthly changes in international reserves



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

The interest rate differential (IRD) on deposits⁵¹ has been oscillating since late 2003 below the calm threshold level (Figure 5.9). In June 2008 the indicator approached the threshold, but a warning signal has not been sent. Even if the interest rate differential threshold calculated for the whole sample period can be considered biased due to unusually high interest rates in Turkey around the 2001 crisis, neither of the thresholds is exceeded in recent months.

Figure 5.10 plots the annual change in the short-term debt to reserves indicator against time. While it sends a correct signal prior to the 2008 crisis, it also sends false warning signals in the aftermath of tightening international financial market conditions in 2004, which did not, however, turn into a full-fledged crisis. In recent months, the ratio of short term debt to reserves is alerting with signals issued throughout September 2010 and January 2011.

⁵¹ KRL and Edison also consider lending-deposit interest rate differential to investigating the quality of loans. However, the data on lending rates does not exist in Turkey.

Figure 5.9 Interest rate differential

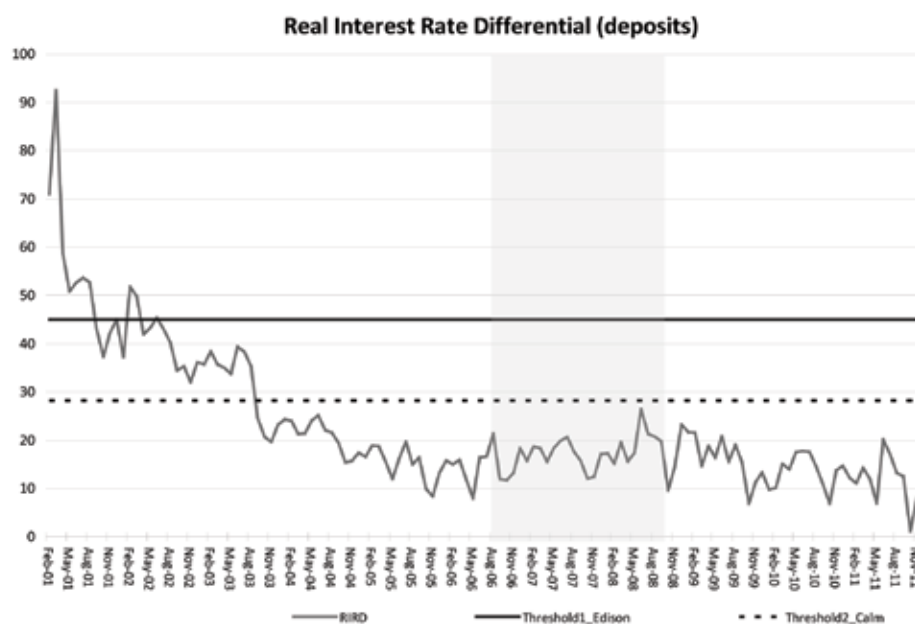
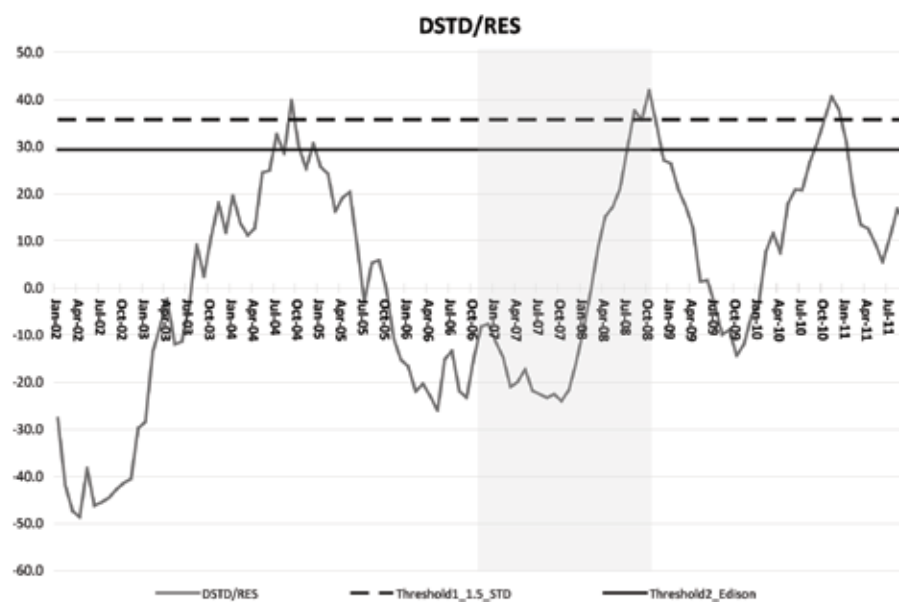
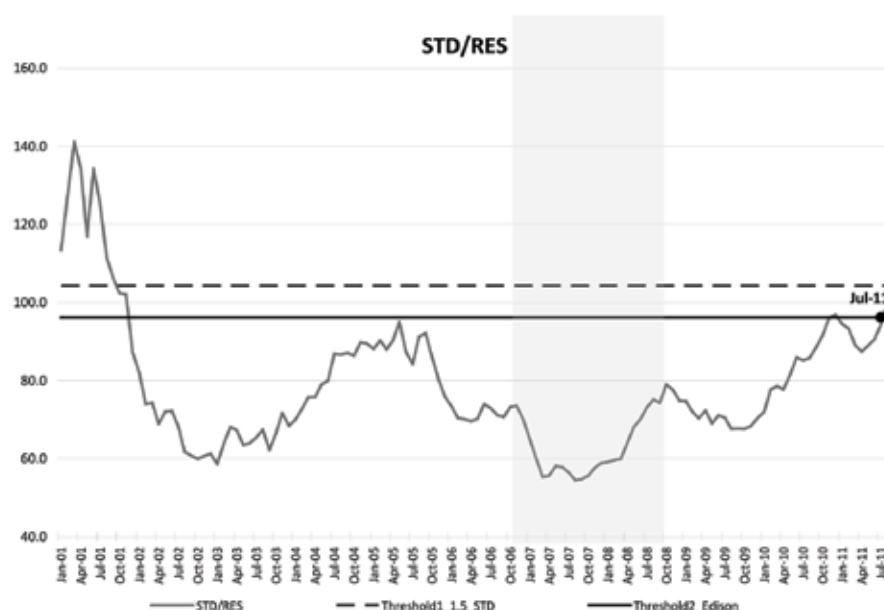


Figure 5.10 The ratio of short-term debt to reserves (y-o-y change)



Note: Own calculation based on the CBRT data. Monthly values of short-term debt (STD) were interpolated from quarterly data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

Figure 5.11 The ratio of short-term debt to reserves (level)

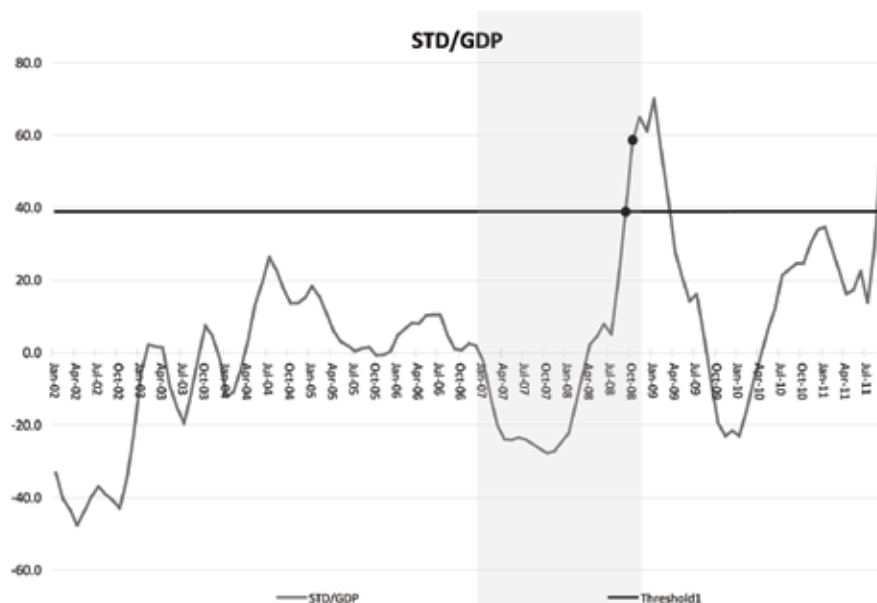


Note: Own calculation based on the CBRT data. Monthly values of short-term debt (STD) were interpolated from quarterly data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

Figure 5.11 looks at the ratio of short-term debt to reserves (this indicator was the best-performing of the reserve measures in the early warning study of Frankel and Saravelos, 2010). Although the indicator fails to predict the 2008 crash, it does warn about vulnerabilities existing in 2001 as well as currently. Since July 2011, the short-term debt to reserves ratio in Turkey is above the threshold value computed with the use of Edison’s critical values.

The last indicator bearing on the situation in the Turkish capital account is the stock of short-term debt as a ratio of GDP (Figure 5.12). It has been selected on the basis that a) a rapid build-up of short-term debt has been observed in recent years in Turkey; and b) such rapid build-up was a key factor in financial crises that hit, for example, Mexico in 1994-95, or East Asia in 1997-98. Indeed, this indicator also signals the 2008 crash in Turkey (a warning signal is identified one month prior to the event). In recent months the value of short-term debt to GDP exceeds its threshold level in August 2011 pointing to an accumulation of vulnerabilities related to this indicator.

Figure 5.12 The ratio of short-term debt to GDP (y-o-y change)



Note: Own calculation based on the CBRT data. Monthly values of short-term debt (STD) and GDP were interpolated from quarterly data. 'Threshold1' was calculated as the sample mean plus 1.5 S.D. 'Threshold2' was calculated based on Edison's critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

The next seven indicators describe the state of the financial sector in Turkey. First, the indicator reflecting changes in the ratio of broad money M2 to reserves is looked at (Figure 5.13). Although, it performs well in terms of assessing vulnerabilities related to the 2008 crash, it sends out false signals in other periods. Nevertheless, it does pick up more turbulent times in the Turkish economy. Recent developments in this variable do not point to increasing vulnerabilities; the last warning signal is issued in February 2010.

Second, the ratio of the level of M2 to reserves is calculated (Figure 5.14). Although this indicator has not been sending warning signals until July 2009, it's been on the rise since October 2006. Although, since February 2011, the ratio of M2 to reserves is below the calculated thresholds, it is clear that should monetary policy be further relaxed in Turkey, higher inflow of foreign reserves is needed to avoid vulnerabilities.

Figure 5.13 The ratio of broad money M2 to reserves (y-o-y changes)

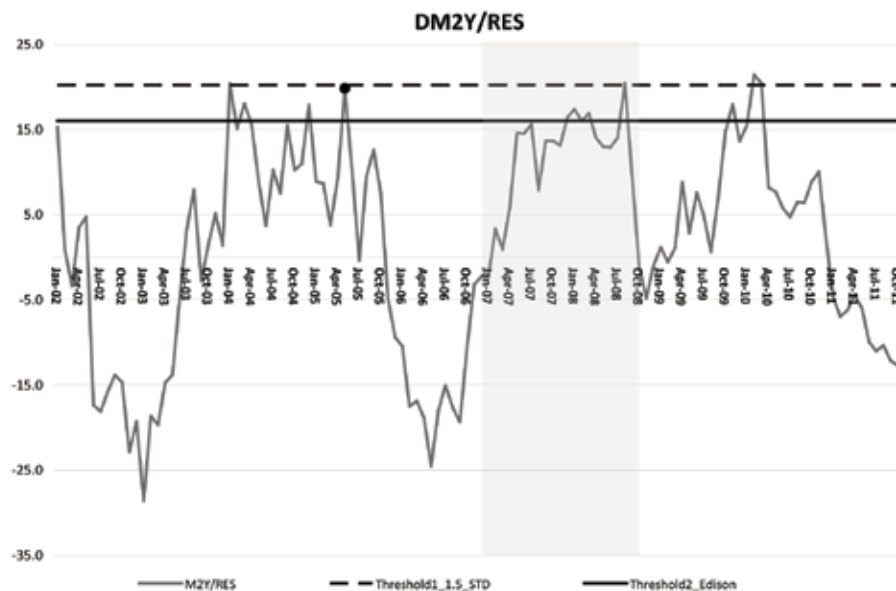
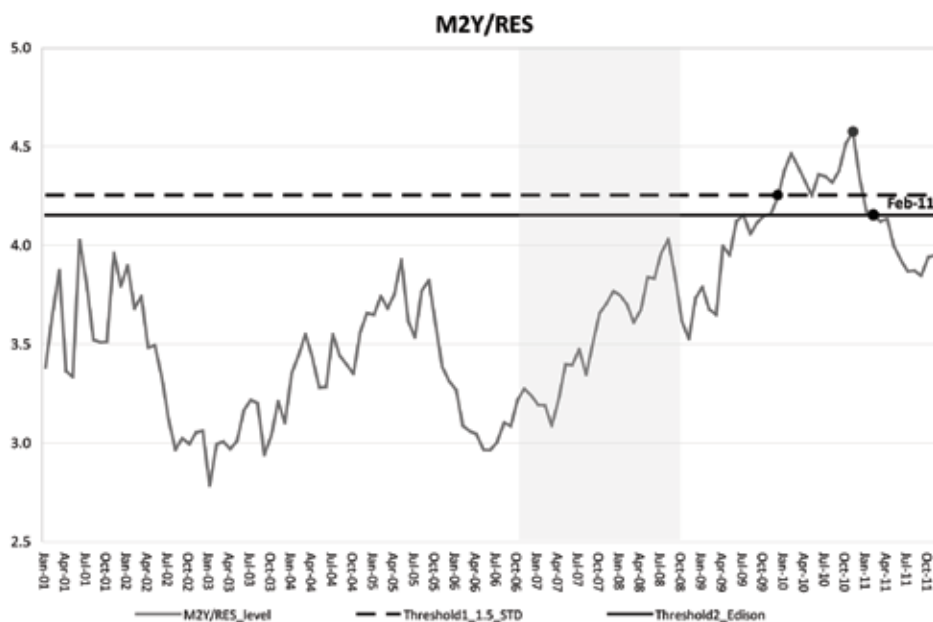
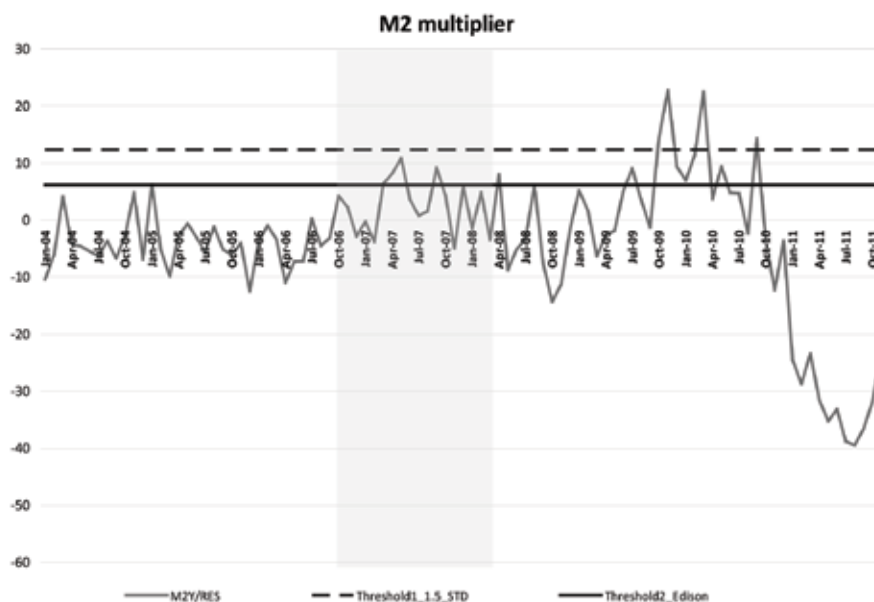


Figure 5.14 The ratio of broad money M2 to reserves (level)



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

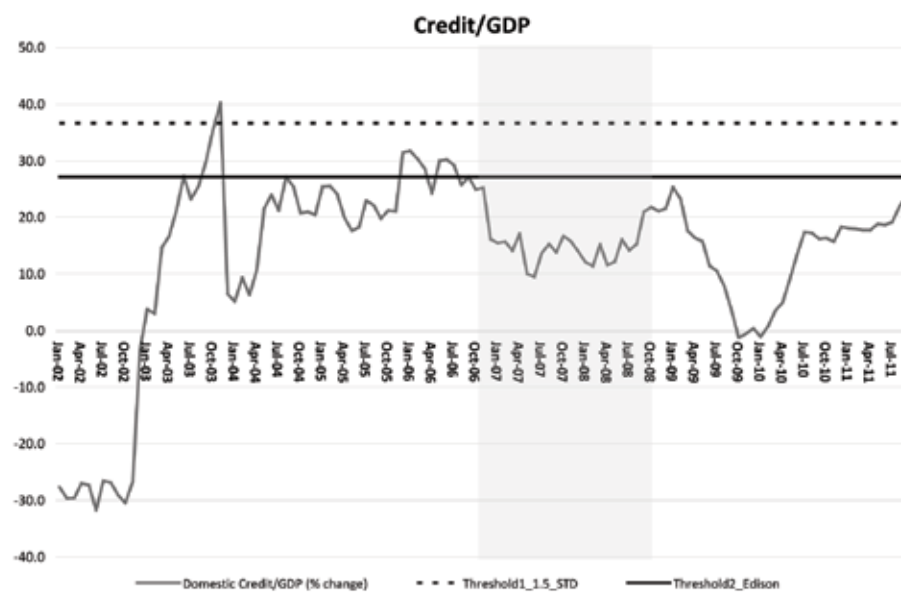
Figure 5.15 Money multiplier



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

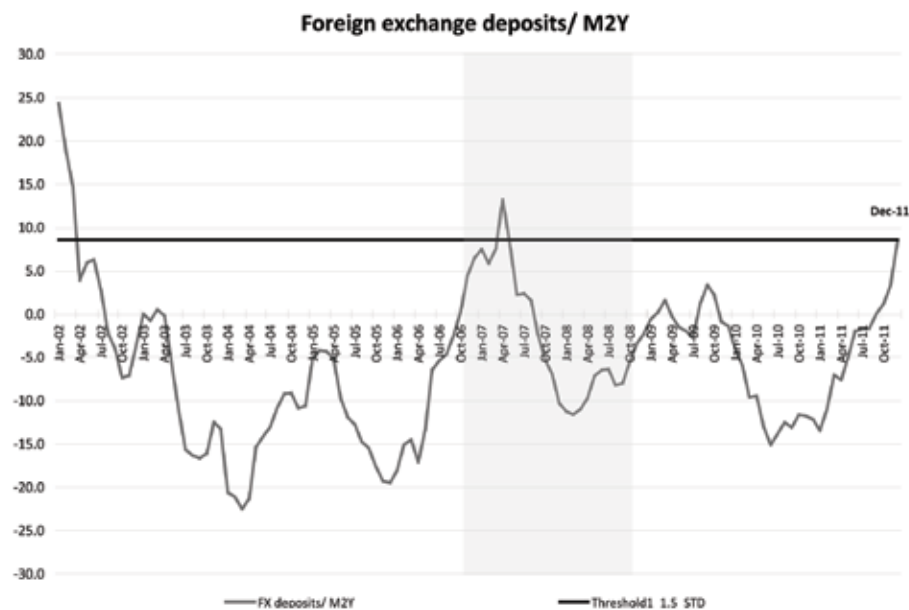
Third, as Figure 5.15 illustrates, the change in the money multiplier M2 displays a lot of noise. Although it correctly predicts the global crisis, the M2 multiplier sends a false signal in July 2009 (it exceeds the threshold value calculated with Edison’s estimated critical values). In September 2010 the M2 multiplier indicator releases the last warning signal against the risk of a potential crisis (both threshold 1 and 2 are crossed). However, since then, the M2 multiplier is quite far away from the value that signals a potential crisis, which may be a result of recent efforts by the monetary and regulatory authorities to subdue credit growth in Turkey. Fourth, credit growth as a ratio of GDP is presented (Figure 5.16). It sends misleading warning signals during the years 2004 and 2006. However, given the tightening of global financial market conditions as well as emerging market financial turmoil in those years (see the EMP index), the signals can be interpreted as pointing to a necessity to implement corrective policies to reduce the exposure to global market conditions. Also, since the 24-month window is somewhat arbitrary and since the credit growth indicator issues its last signal in September 2006, which is 25 months before the October 2008 crash, it can be read as a warning signal. In recent months, the annual rate of domestic credit growth as a ratio of GDP has been on the rise. However, no signal has been issued up to September 2011.

Figure 5.16 Claims on the private sector



Note: Own calculation based on the CBRT data. Monthly values of GDP were interpolated from quarterly data. 'Threshold1' was calculated as the sample mean plus 1.5 S.D. 'Threshold2' was calculated based on Edison's critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

Figure 5.17 Currency mismatch: ratio of foreign exchange deposits to broad money M2



Note: Own calculation based on the CBRT data. 'Threshold1' was calculated as the sample mean plus 1.5 S.D. The shaded area represents a 24-month crisis window before the 2008 crash.

The fifth financial indicator that is examined is the ratio of foreign exchange (FX) denominated deposits to M2Y (Figure 5.17). As indicated in the previous section, FX denominated deposits have been on the rise since the third quarter of 2011. A similar picture emerges when the indicator is calculated for the monthly data and in first differences (y-o-y). Moreover, this indicator also flags problems before the 2008 crash. Although, up to the end of 2011, its value did not exceed the threshold level, it was not far off from this value; in December 2011, the annual rate of the increase of FX-denominated deposits as a ratio of M2 was 8.4 versus 8.6, the threshold value. This indicates increased risk of default in case of large currency depreciation.

Sixth, the developments in the real credit growth as well as loans-to-deposit (LTD) ratio are examined (Figure 5.18). It is true that real credit growth to the private sector has been increasing since the end of the 2008 crisis. However, credit increases are still below the threshold level. What is more, they are not very different to the rates observed during some periods of 2004, 2005 and 2006. This in fact should not be surprising given the developments in real interest rates in Turkey, which have been fairly stable since 2004. Nonetheless, what is troublesome is the fact that the ratio of loans to deposits has been on the rise throughout the analysed period, exceeding its threshold towards the end of 2011. Facing the mismatch between loans and deposits, banks reverted to external sources of financing as reflected in the increased importance of banking sector liabilities in the Turkish balance of payments (see Table 3.1 in Section 3).

Last, the real interest rate indicator (Figure 5.19) oscillates around the calm period threshold since late 2004. There seems to be limited risk of a credit crunch as the real interest rate on deposits is at its historic low in the aftermath of the 2008 crisis. It should be noted however that such low real interest rates undoubtedly contribute to the rapid credit growth (see also Section 4) and widening of the CA deficit in Turkey from the second half of 2010 until October 2011.

Figure 5.18 Real credit growth and LTD ratio

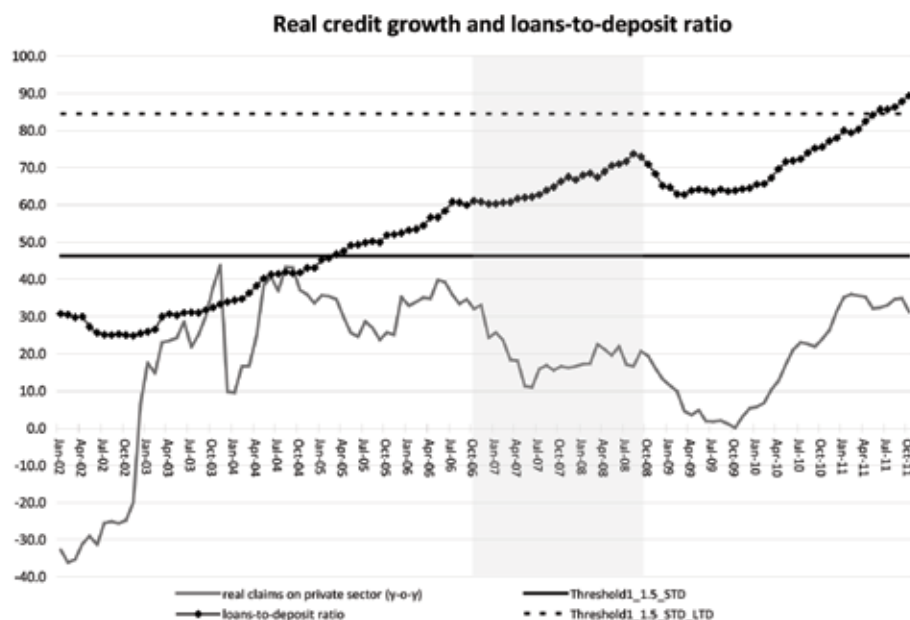
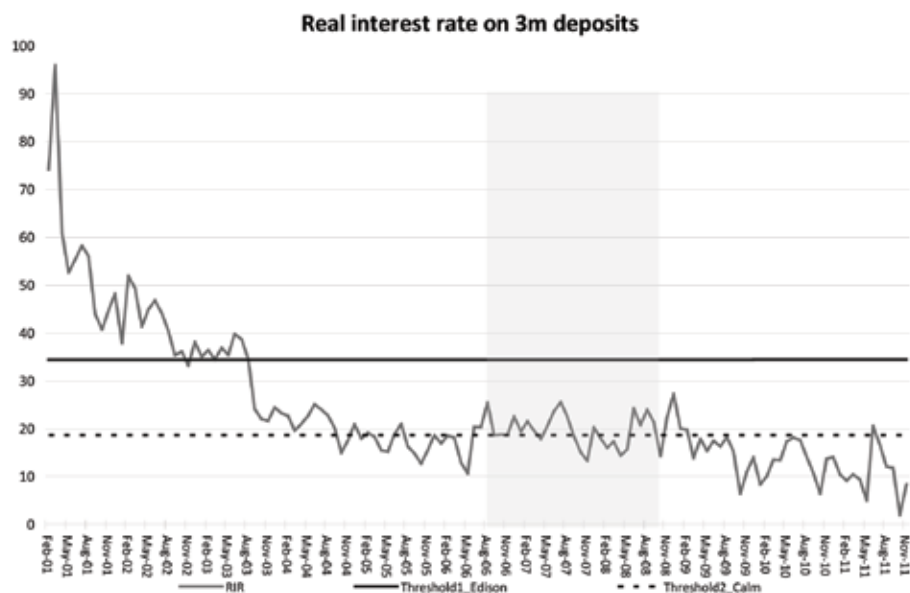


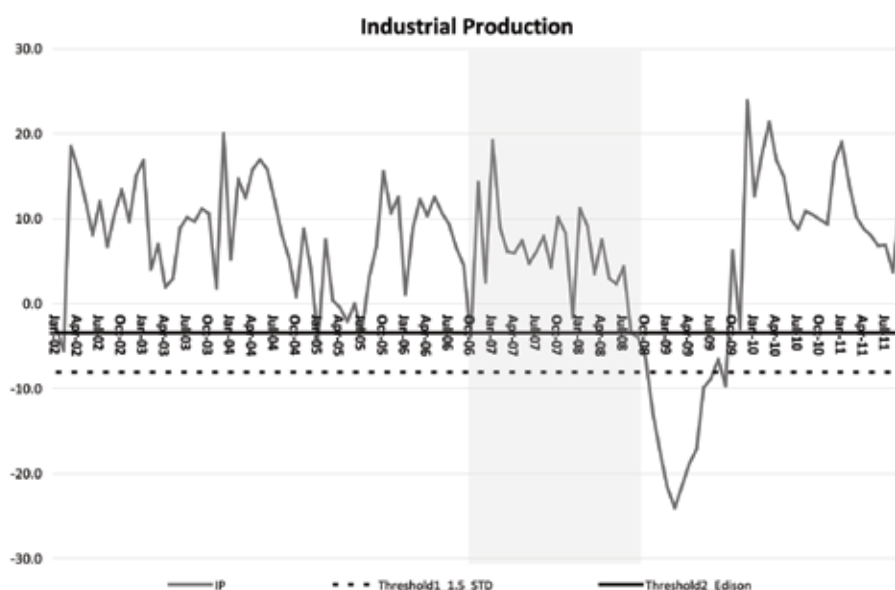
Figure 5.19 Real interest rate – 3 months deposits



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

The last set of indicators discussed in this section aims at assessing the performance of the real sector in Turkey. As mentioned in Section 4, a financial crisis often happens when the economy enters a recession following a prolonged boom in economic activity. Below, two indicators are considered: the output growth and equity prices. To assess output changes in Turkey and their predictive crisis power, the index of industrial production is looked at (Figure 5.20). The indicator does send a warning signal before the 2008 recession. It also issues some signals in 2005, which could be a warning signal against the vulnerabilities Turkey experienced in 2006, but of course, those signals fail to predict a full-blown crisis. There are no warning signals sent in recent months.

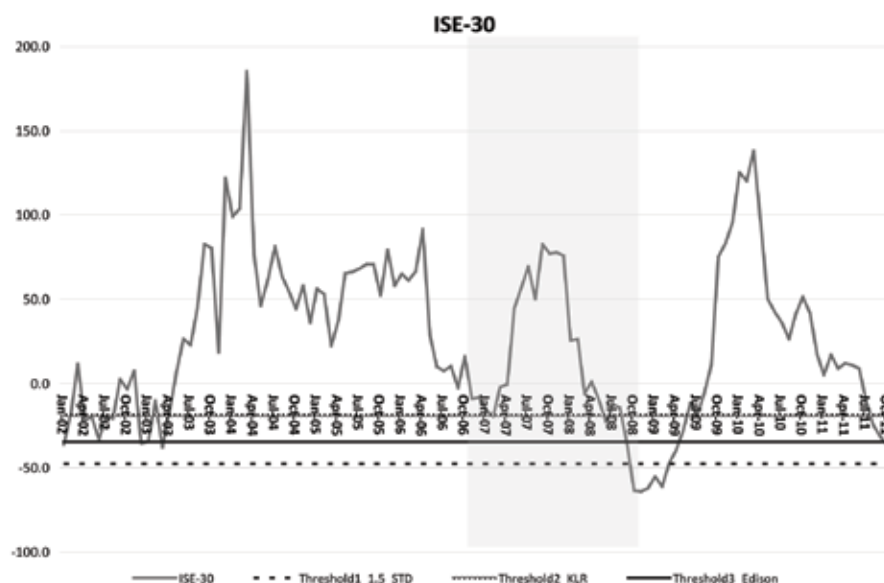
Figure 5.20 Industrial production growth rate (y-o-y)



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

The second indicator which assesses the performance of the real economy is the stock market indicator (Figure 5.21). Three thresholds were presented with respect to this variable as the percentiles calculated by Edison differ from those calculated by KLR by 0.1, which is significant. Despite the differences in thresholds, they all capture the 2008 crash. The threshold obtained by using the KLR percentiles is somewhat too sensitive as it not only picks up crashes, but also identifies vulnerabilities, which existed in the Turkish economy after 2001.

Figure 5.21 Stock market price index (y-o-y)



Note: Own calculation based on the CBRT data. ‘Threshold1’ was calculated as the sample mean plus 1.5 S.D. ‘Threshold2’ was calculated based on Edison’s critical values. The shaded area represents a 24-month crisis window before the 2008 crash.

5.2. Assessing the potential for a crisis in Turkey

In this section, an assessment of the recent and past signalling behaviour of the fifteen indicators selected in the KLR (1998) and Edison (2003) studies on aggregate is set out. The results presented here should be interpreted as measures of the Turkish exposure to crisis rather than crisis predictors⁵². As stressed by the joint IMF and FSB (2010) work, the success of analytical tools in predicting financial crises has usually been limited to gauging the *potential* for a crisis to manifest itself.

Table 5.1 below presents the number of signals issued by each indicator in the 2-year window periods (columns from III to XVIII) as well as the total number of signals issued by all 15 indicators in each of the selected windows (column I). In order to assess the *potential* for a crisis in Turkey in each of the 2-year windows analysed, first, monthly

⁵² Studies which follow the KLR (1998) approach do try to assess the probability of crisis in the 24-month period from the time the first signal is issued.

⁵³ A single composite crisis indicator is calculated as the weighted-sum of all signalling indicators. The weights are equal to the inverse of each indicator’s noise-to-signal ratio. The noise-to-signal values associated with a particular indicator are taken from Edison (2003). The lower the noise-to-signal ratio, the better the performance of the indicator; i.e. the less false signals are sent.

composite crisis indices are calculated following KLR (1998) and Edison (2003)⁵³. Once these are obtained, to infer the likelihood of a crisis, the study borrows probabilities of such events associated with each value of the composite index⁵⁴ from Edison (2003), and calculates the 2-year averages. To see the evolution of monthly *potential* for a crisis in Turkey, the plots of monthly probabilities against time are presented in Figure 5.22.

The picture which emerges from the information gathered in Table 5.1 is that in years 2002-2003, 2008-2009 and 2010-2011 (up to September), on average, more signals were issued than in years 2004-2005 and 2006-2007. Clearly, the largest number of warning signals (61) was sent during the period of the global crisis. It is notable that 40 signals issued between January 2010 and September 2011 outnumber the signals issued in the post-2001 crisis period (36), 2002-2003. The indicators which send the highest number of alerts in the latest period of this study are: imports, terms-of-trade, the ratios of M2 and STD to reserves, and the change in the ratio of STD to reserves. This can be contrasted with signals sent during the 2008-2009 turmoil, which are exports, the real exchange rate, reserves, output, equity prices, the money multiplier and the change in the ratio of M2 to reserves. Clearly, only the indicators associated with the level of reserves in Turkey send signals in both periods. Even if the real exchange rate indicator has the lower noise-to-signal ratio than measures of reserves adequacy in Edison's (2003) study (see Table 5.1), Frankel and Saravelos (2010) point out that among 83 early warning indicators, the ones related to foreign exchange reserves were found to be significant predictors of crises. Furthermore, foreign exchange reserves are the best crisis predictors of the 2008 global crash in their analysis. Therefore, attention should be paid to the performance of this indicator.

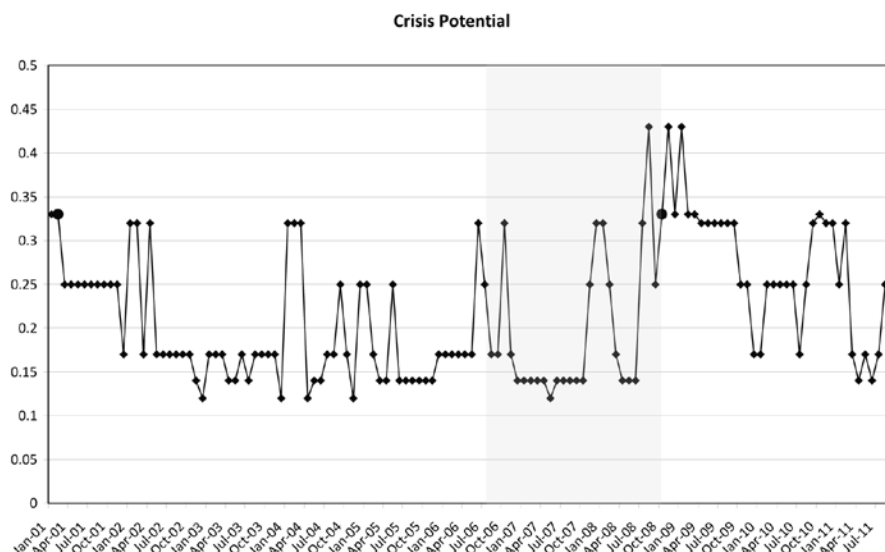
Table 5.1 Performance of selected warning indicators in Turkey within the 24-month periods

	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI	XVII
			Exports	Imports	RER	TOT	Reserves	RIRD	Output	Equity	Credit/ GDP	RIR	M2 multi.	M2/ Res	DM2/ Res	STD/ Res	DSTD/ Res
			Noise-to-signal ratio														
			0,6	0,88	0,26	0,7	0,53	1	0,59	0,57	0,75	0,66	0,86	0,47	0,52	0,47	0,4
	total # of signals	average crisis probability	Number of signals sent in the 2-year window														
2002-03	37	0,18	0	4	1	1	2	1	1	9	5	13	0	0	0	0	0
2004-05	29	0,18	0	5	3	1	0	0	0	2	7	3	1	0	3	0	4
2006-07	28	0,18	0	0	2	7	0	0	1	1	11	0	5	0	1	0	0
2008-09	63	0,28	10	1	4	3	9	0	11	8	1	0	7	2	4	0	3
2010- Sep 2011	42	0,24	0	4	1	6	0	0	0	2	0	0	2	13	2	7	5

Source: Own calculations based on the CBRT and IMF IFS data.

⁵⁴ The probability of crisis for each value of the aggregate index in Edison (2003) is obtained following KLR (1998) by observing how often, within the sample, a given value of the aggregate index is followed by a crisis within 24 months.

Figure 5.22 Crisis probability



Note: The dotted line depicts a probability of crisis. Own calculation based on the CBRT and IMF IFS data. The shaded area represents a 24-month crisis window before the 2008 crash.

Looking at the 2-year averages of crisis probabilities (column II in Table 5.1), it seems that since the last crisis, the *potential* for a crisis in Turkey is higher. Contrasting this picture with the evolution of crisis probabilities over time as illustrated by Figure 5.22, it is possible to deduce that the probability of crisis in the next 24-months in September 2011 is lower than it was at the beginning of the year (i.e. February 2011), and lower than it was in months preceding the October 2008 crash. However, it is higher than it was in the middle of 2011. Assessing the potential for a crisis in Turkey before 2001 and 2008 crashes, Figure 5.22 shows that this potential increased just before and after the events⁵⁵. However, it was also elevated around more turbulent times in the Turkish economy (as detected by the EMP index).

⁵⁵ The fact that the analysis conducted in this section starts only from January 2001 does not allow to discuss the potential for the 2001 crisis in full detail.

SECTION 6

CONCLUSIONS

The Turkish economy had a strong recovery from the global crisis of 2008-2009. During the post-crisis period, increasing short-term capital inflows have been associated with, until very recently, an appreciating real exchange rate and credit growth, which have fuelled domestic demand. The resulting surge in imports has led to a sharp widening of the current account deficit such that the current account deficit reached its historical high of 9.8 percent of GDP in 2011, from 6.3 percent observed in 2010. As the models of financial crises surveyed in Section 2 reveal, surges in short-term capital inflows, large current account deficits and appreciating exchange rates often precede financial crises. However, predicting a financial crisis is an extremely difficult, if not an impossible task. This is because the triggers of such events cannot be known beforehand. Therefore, a key to avoiding crashes or at least diminish its devastating effects on the economy is to identify underlying imbalances and take necessary corrective measures sufficiently early on. Certainly, some crises, especially those triggered by shifts in expectations, cannot be avoided by policy changes. Nonetheless, the adverse consequences of such crises are greater in countries with weak fundamentals, which in turn deteriorates expectations.

The research conducted in this report assesses vulnerabilities in the Turkish economy since 2010 and the potential for a future crisis. To this end, Section 2 reviews existing models and theories of financial crises. Given the massive short-term capital inflows to Turkey in the last couple of years, and the fact that excessive capital flows can cause a disruption to the financial system or serious macroeconomic imbalances, Section 3 provides a historical overview of capital flows to Turkey and the role such flows played in past crises. Recent trends in capital flows and their structure are also discussed in this section. Guided by the conclusions made in Sections 2 and 3, Section 4 examines the behaviour of indicators presented in the literature as useful for monitoring economic vulnerabilities based on quarterly data. A more formal analysis in the form of an early warning exercise following KLR (1998) is conducted in Section 5.

The following main findings and conclusions emerge from the analysis carried out in this report. First, fundamental weaknesses existing in economies which experienced crisis episodes in the past are often very similar. Therefore, the lessons from existing models and theories should not be overlooked. The results of the early warning analysis carried out in Section 5 indicate that monthly probability of a crisis in the next 24-months has shown some fluctuations since the beginning of 2010 pointing to the existence of vulnerabilities of the economy. Similarly, there has been evidence of exchange market pressure since the beginning of 2011, even if the values of the EMP index remain below the threshold value that correctly signals both 2001 and 2008-09 crises of Turkey.

Second, looking at the developments in particular indicators, imports, terms-of-trade, the ratio of M2 to reserves, and both the level and annual change in short-term debt to reserves ratio send the highest number of alerts in the second half of 2011. The identification of insufficient level of reserves in comparison to the stock of short-term debt as an indicator of vulnerability is perhaps one of the most important results of this report. This is because the stock of the central bank's reserves in comparison to the short-term debt may not be enough to limit the risk associated with a sudden reversal of capital flows.

Other important indicators which signal vulnerabilities in Turkish economy are the current account deficit as a ratio of GDP, real exchange rate, and ratio of loans to deposits (LTD). As the analysis conducted in Section 3 reveals, the first is worrisome given the composition of capital inflows in the aftermath of the 2008-09 crisis. Among the indicators that describe the state of the financial sector in Turkey, only the ratio of loans to deposits (LTD) has sent warning signals. Given the fact that capital flows to Turkey are channelled by banks in recent years (Section 3), the increasing LTD ratio means that banks increasingly rely on foreign financing to extend loans denominated in the local currency. By contrast, real sector indicators such as the behaviour of real GDP, the ratio of investment expenditures to GDP and the efficiency of investment show no sign of vulnerability as of end 2011, as opposed to the pre-global crisis period. However, the stock market indices did issue the warning signal in October 2011. Finally, the developments in indicators related to the fiscal aspect of the economy analyzed in Section 4 do not signal any vulnerability, and imply that Turkey follows sound fiscal policies since the 2001 crisis. Nevertheless, given large imbalances existing in other sectors of the economy, perhaps, tighter fiscal stance could facilitate reducing them.

To sum up, based on the results of this report it can be suggested that a number of policy changes are needed to correct existing imbalances and to reduce vulnerabilities faced by the Turkish economy. Although more recent data points to decreases in the current account deficit, challenges and risks remain. This is because Turkish economic growth relies on capital inflows to finance imports and domestic investment. This dependence leaves the economy prone to sudden stops and boom-bust cycles.

The recent decline in the current account deficit is most likely related the combination of two factors: the fall in capital inflows to Turkey due to recessionary developments in Europe and the measures taken by the monetary and regulatory authorities to slow down the credit growth. However, in the near term, given higher oil prices and the fact that energy accounts for the large part of the trade deficit in Turkey, the very recent slowdown in import demand may not lead to a desired reduction in the current account deficit. On the export side, the European debt crisis limits the room for expansion. Furthermore, the recent increase in the rate of inflation, which turned out to be one of the highest among

the main developed and emerging economies, has reversed the tendency for real exchange rate depreciation. This, in turn, presents another obstacle in Turkey's ability to improve its trade deficit.

A salient feature of the recent growth performance of the Turkish economy is that it has been achieved at the expense of buoyant current account deficits. Given the vulnerabilities associated with such current account deficits and the capital inflows that accompany them, more fundamental policy changes are necessary in order to reduce Turkey's external imbalances at the same time as maintaining high growth rates. Since investment is a key determinant of growth – especially for a middle-income country like Turkey – one way of achieving this is by increasing the share of investment expenditures financed through domestic and not foreign savings. In our view, the measures to achieve this end should be among the main priorities of the policy debate in Turkey.

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APPENDIX 1

Table A.1 Turkey's Gross External Debt Stock (\$ millions)

	2004	2005	2006	2007	2008	2009	2010
TOTAL	160,977	169,872	207,761	249,425	280,444	268,764	290,350
SHORT TERM	32,205	38,283	42,623	43,135	53,104	49,716	78,641
PUBLIC SECTOR	1,840	2,133	1,750	2,163	3,248	3,598	4,353
FINANCIAL INST.	1,815	1,733	1,555	2,163	3,148	3,598	4,353
Banks	1,815	1,733	1,555	2,163	3,148	3,598	4,353
NON-FINANCIAL INST.	25	400	195	0	100	0	0
State Owned Enterprises	25	400	195	0	100	0	0
CBRT	3,287	2,763	2,563	2,282	1,874	1,776	1,576
Dresdner Bank Scheme	3,286	2,762	2,562	2,281	1,873	1,775	1,575
Other	1	1	1	1	1	1	1
PRIVATE SECTOR	27,078	33,387	38,310	38,690	47,982	44,342	72,712
FINANCIAL INST.	13,118	17,210	20,702	16,629	24,489	22,554	48,795
Banks	12,714	16,562	19,993	16,167	24,269	22,253	47,789
Non-Banking Institutions	404	648	709	462	220	301	1,006
NON-FINANCIAL INST.	13,960	16,177	17,608	22,061	23,493	21,788	23,917
LONG TERM	128,772	131,589	165,138	206,290	227,340	219,048	211,709
PUBLIC SECTOR	73,828	68,278	69,837	71,362	75,037	79,853	84,570
GENERAL GOVERNMENT	70,114	65,921	67,854	68,813	72,362	77,139	81,552
Central Government	68,584	64,643	66,577	67,121	69,757	74,054	78,074
Local Administrations	1,112	960	1,030	1,505	2,466	2,993	3,417
Funds	418	318	248	187	138	91	61
FINANCIAL INST.	656	318	487	620	590	1,106	1,744
Banks	656	318	487	620	590	1,106	1,744
NON-FINANCIAL INST.	3,058	2,039	1,496	1,929	2,086	1,609	1,274
SOE's	2,840	1,894	1,390	1,812	1,892	1,437	1,133
Other	218	145	106	117	194	172	141
CBRT	18,123	12,662	13,115	13,519	12,192	11,529	10,251
CBRT Loans	2,995	0	0	0	0	0	0
Dresdner Bank Scheme	15,119	12,654	13,106	13,510	12,183	11,520	10,242
NGTA	9	8	9	9	9	9	9
PRIVATE SECTOR	36,821	50,648	82,186	121,409	140,111	127,665	116,889
FINANCIAL INST.	8,565	16,059	28,493	41,861	41,092	35,409	34,195
Banks	5,794	12,334	22,063	30,921	30,025	27,952	28,277
Non-Banking Institutions	2,771	3,725	6,429	10,939	11,067	7,457	5,918
NON-FINANCIAL INST.	28,256	34,589	53,693	79,548	99,019	92,256	82,693

Source: Undersecretariat of Treasury

APPENDIX 2

Table A.2: Performance of Indicators

I	II	III	IV	V	VI
Indicator	Transformation	Tail	Individual Turkish thresholds*	Thresholds calculated based on Edison's critical region	Edison's size of the critical region**
External					
1. Exports	12m growth rate	lower	-11.3	-2.9	10
2. Imports	12m growth rate	upper	59.0	45.3	10
3. Real exchange rate	Deviation from trend1	lower	-12.5	-10.1	10
4. Terms of trade	12m growth rate	lower	-6.5	-5.1	7
5. Reserves	12m growth rate	lower	-6.8	-1.7	10
6. Real interest rate differential	Level (in %)	upper	49.7	50.3	10
Real					
7. Output (industrial production)	12m growth rate	lower	-8	-3.4	14
8. Stock market prices (ISE-30)	12m growth rate	lower	-47.4	-18.8	20
Financial					
9. Credit/GDP ¹	12m growth rate	upper	36.7	24.1	10
10. Real interest rate	Level (in percent)	upper	51.6	40.2	20
11. M2 multiplier	12m growth rate	upper	6.2	19.7	15
12. M2/ reserves	level	upper	4.3	4.2	12
13. ΔM2/ reserves	12m growth rate	upper	16.0	20.2	10
Debt profile					
14. STD/ reserves	level	upper	95.1	104.3	12
15. ΔSTD/ reserves	12m growth rate	upper	29.4	35.7	12
Indicators not included in the KLR (1998) or Edison (2003) studies					
16. Current Account/ GDP ²	Level (cumulative)	lower	-7.8	-	-
17. STD/GDP	Level	upper	39	-	-
18. FX deposits/ M2	12m growth rate	upper	8.6	-	-
19. Credit to private sector	12m growth rate (real)	upper	46.4	-	-
20. Loans-to-deposits	level	upper	84.6	-	-

Note: Own calculation based on CBRT and IMF IFS data. Lower and upper distribution tails (Column III) are chosen based on the financial crisis literature (see, for example, KLR, 1998). “*” individual thresholds in Column IV correspond to Threshold1_1.5_STD in Figures from 5.3-5.21, and are calculated as in Edison (2003), i.e. the mean of the indicator plus (or minus) 1.5 of standard deviation of this average. “***” critical values are taken from Edison (2003), Data Appendix, Table 6.

¹ The real exchange rate is the nominal exchange rate (TL/\$ rate), adjusted for relative consumer prices (CPI indices were used, 2005=100). An appreciation of the Turkish lira is a decline in the real exchange rate. Indicator is measured as deviation from trend (trend was obtained using the HP filter, lambda=14400).

² Monthly GDP numbers are interpolated from quarterly data using Cubic Spine method.



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