CURRENT ACCOUNT SUSTAINABILITY
AND CAPITAL FLOWS
CASE OF TURKEY

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A thesis submitted to the faculty of
The University of Utah
in partial fulfillment of the requirements for the degree of

Master of Science

Department of Economics
The University of Utah
August 2012
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ABSTRACT

This thesis applies Granger Causality Tests to balance of payments accounts of Turkey between the first quarter of 1992 and the last quarter of 2009, in order to test effectiveness of current account sustainability indicators that are derived by two major theoretical conceptions about current account sustainability.

First theoretical conception is called “current account oriented views.” That approach states that high and persistent current account deficits may be outcomes of some structural vulnerabilities of the domestic economy. Those vulnerabilities can arise from trade deficits, budget deficits, and saving-investment gap.

Second theoretical conception is called “capital account oriented view.” According to that approach, high and persistent current account deficits are the main outcomes of speculative-led economic growth and current account deficits which are induced by high capital inflows.

Results show that the current account balance of Turkey is mainly driven by capital-financial account and portfolio investments subaccount, during postinternational financial liberalization era. Additionally, causal relationship between current and capital-financial account balances arises from causality from capital-financial account to goods and services subaccount of current account.

Finally, according to test results, financial account oriented indicators are found more effective than conventional indicators.
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ACKNOWLEDGEMENTS

I would like to thank to my parents and my sister for their great considerable emotional and motivating support. Additionally, I would like to thank to my friends in my life for their continuous support to me.

I would like to thank to Codrina Rada for her invaluable support in writing process. Last but not least, I would like to thank to Gunseli Berik for her judiciousness and for being a source of inspiration for me.
CHAPTER I

INTRODUCTION

Current account balance and its dynamics, determinants and consequences constitute an important issue in open macroeconomics literature. The Turkish economy experienced three current account reversals (1994-2001-2009), accompanied with a fall in GDP level. Consonant with that, sustainability of current account deficits has become one of the main disputes among macroeconomics literature of Turkey (Uygur, 2004; Ozmen 2004a, 2004b).

There are two main theoretical conceptions of current account imbalance and they can be grouped as “current account oriented views” and “capital account oriented views.” According to the first approach, high and persistent current account deficits may be outcomes of some structural vulnerabilities of the domestic economy. Those vulnerabilities can arise from trade deficits, budget deficits, and saving-investment gap. In order to make a proper assessment about current account deficits, several indicators are developed. These indicators are based on intertemporal solvency conditions of a country and illustrate sustainability of current account deficits (Milesi-Ferretti & Razin, 1996a, 1996b; Roubini & Wachtel, 1998).

The second approach – capital account oriented views – asserts that high and persistent current account deficits are the main outcomes of speculative-led economic growth and current account deficits which are induced by high capital inflows
(Onaran, 2006; Paula & Alves, 2000). According to this approach, financial markets are inherently prone to crisis. Moreover external financial liberalization places exchange rate risks on this crisis prone structure. Capital inflows drive speculative growth and competitive international pressures cause further capital inflows combined with increasing real interest rates, which in turn leads higher real exchange rates. Increased real exchange rates deteriorate current account balances through increasing trade deficits. This cycle continues until conventional optimism becomes reversed, against the sustainability of that cycle. After pessimism spreads out among investors, reversal in capital flow starts and ends with currency depreciation in conjunction with dramatic reductions in output and employment levels in domestic economy. To sum up, current account deficits are the reflection of aforementioned structure and several measures are developed, such as “external fragility index” (Paula & Alves, 2000), in order to make coherent assessments about vulnerable nature of domestic economy and current account deficits.

In this work, causal relationship between current account and financial account balances is investigated by analyzing the postfinancial liberalization era in Turkey, between the last quarter of 1991 and the last quarter of 2009. Granger causality tests are implied to test causal relationship between those balances. According to results of the aforementioned test, if current account deficits are induced by capital flows or financial account surpluses, high and persistent current account deficits are the reflections of external fragility of a country. However, if capital flows or financial account surpluses are induced by current account deficits, it can be argued that current account deficits may reflect the major structural vulnerabilities of Turkish economy.
This work is composed of seven chapters, including introduction chapter. In the second chapter of this work, theories about current account deficits are discussed on the base of current account and capital account oriented views.

In the third chapter, importance of current account sustainability for Turkey is illustrated. After financial liberalization, 1989, Turkish economy experienced three current account reversal periods which are associated with dramatic falls in GDP level.

In the fourth chapter, conventional sustainability indicators of Turkey are illustrated. These operational indicators are derived on the base of intertemporal solvency approach and they reflect the economy’s potential to generate future export revenues. Those practical indicators are named “conventional indicators” and they can be grouped as:

- Sources of current account deficits, composition of the current account, composition and size of the capital inflows, real exchange rate appreciation, foreign exchange reserves and the debt burden, fragility of financial system and finally political instability and uncertainty about the economic environment. (Roubini & Wachtel, 1998)

In the fifth chapter, financial fragility indicators, derived by capital account oriented views, are reflected on the base of Turkish data and it is discussed whether those indicators are effective in reflecting the sustainability of current account deficits.

The sixth chapter deals with causal relationship between current account balance and capital flows on the base of data gathered from Turkey between last quarter of 1991 and last quarter of 2009. It is found that Turkey’s current account deficits are mainly driven by capital flows. That fact discredits the conventional current account sustainability indicators while protecting the reputation of capital account oriented indicators.
The importance of financial regulations in order to achieve current account sustainability is emphasized and some suggestions for future works are emphasized in the conclusion chapter.
CHAPTER II

DOES CURRENT ACCOUNT OR CAPITAL ACCOUNT MATTER?

Current Account Oriented Views

Current account oriented views consider high and persistent current account deficits as a reflection of major vulnerabilities of domestic economy which may be sourced from internal and external factors (Milesi-Ferreti & Razin, 1998, 1996a, 1996b; Roubini & Wachtel, 1998; Edwards, 2001). Effects of reversals in current account deficits are studied by Edwards (2002, 2004) and Milesi-Ferreti and Razin (1998). Their results emphasize that any sharp reversals in current account deficits directly lead to sharp reduction in economic growth.

Countries that have high current account deficits are more likely to experience reversals that are accompanied with decline in economic growth. Due to the strong relationship between current account deficits and possible reduction in output, current account sustainability has become an important concept among current account oriented views.

Several measures are developed in order to evaluate current account deficits. First sustainability approach adamantly defends that the high and persistent current account deficits pose a risk regardless of their source. Freund (2000, 2005) analyses the 25 episodes of current account reversals that took place in industrial countries and
concludes that current account deficits tend to reverse if they are higher than 5 % of GDP. Dornbusch (2002) states the same benchmark as 4 % of GDP that is associated by 25 % real appreciation during 2 to 3 years. Obstfeld (2004) defends that current account deficits must be financed by external borrowing which paves the way for government budgetary intervention and thus increases the solvency risk of a country.

Consonant with those arguments, Milesi-Ferreti and Razin (1996a, 1996b) refuse the position that defends that current account deficits higher than a certain threshold are not sustainable. Milesi-Ferreti and Razin develop a sustainability framework which states that current account deficits are sustainable if they are consistent with solvency conditions. That framework is based on intertemporal solvency of a country which is highly related with willingness of international investors to lend and willingness of domestic investors to pay.

Roubini and Wachtel (1998) associate capital outflows with solvency problems of a country and establish current account sustainability framework on solvency content. Several operational sustainability indicators are established in order to make assessment about current account sustainability. Those practical indicators will be illustrated in Chapter IV on the basis of Turkish data.

After 2001 crisis, literature on current account sustainability of Turkey developed extensively. These works mainly intensified on structural problems of domestic economy such as debt sustainability, trade deficits and budget deficits.

Kalyoncu (2005) examines current account sustainability of Turkey between the first quarter of 1987 and the last quarter of 2002 by using intertemporal borrowing constraint which emphasizes that discounted value of future trade revenues must exceed
current value of foreign debt. Kalyoncu applies the Johansen co integration test and finds that there is a strong relationship between export and imports of Turkey which shows that current account deficits are sustainable during the aforementioned period. Umit (2011) applied the same test during the period between the first quarter of 1992 and the second quarter of 2010 with structural breaks and finds that current account deficits are sustainable at low levels.

Ongan (2008) applies Johansen co integration test with structural breaks between 1980-2005 in order to find whether there is a strong relationship between exports + tourism receipts and imports + tourism expenditures. Ongan states that despite the increasing contribution of tourism income, Turkish current account deficits are not sustainable since there is no strong relationship between aforementioned variables. Additionally, structural breaks such as capital account liberalization and changes in the exchange rate regime are found quite determinant.

Ogus and Sohrabji (2008) analyze sustainability of current account deficits for Turkey between 1992 and 2004 by testing the equality of actual and optimal consumption smoothing current account. It is found that current account deficits are unsustainable due to the fact that deviation series are found nonstationary between actual and optimal external liabilities.

According to current account oriented views, high and persistent current account deficits reflect the major vulnerabilities of the economy and those vulnerabilities of domestic economy lead to balance of payment crisis periodically. The causal relationship is from current account balance to financial account balance. Because of aforementioned relation, in order to evaluate the sustainability, current account oriented views use some
measures, which are highly dependent to internal factors such as trade deficits, saving-investment gap and budget deficits.

**Capital Account Oriented Views**

A current account deficit must be financed through capital account surplus or foreign exchange reserves. Capital account oriented views emphasize the role of capital inflows in current account deficits (Calvo, 1998; Arestis & Glickman, 2002). According to that approach, high capital inflows exacerbate current account deficits through deteriorating trade balances of domestic economy.

Capital account oriented views are composed of two approaches. The first stream emphasizes capital inflows and effects of sudden stops of capital inflows (Calvo, 1998; Edwards, 2008). According to those authors, fundamentals and policies of domestic country do not have a decisive role on capital flows. In contrast with current account oriented views, developments in the external financial markets have a major impact on periphery countries’ financial markets.

The first approach states that high and sustained capital inflows increase the current account deficits dramatically and due to external factors, a sudden stop in those capital inflows forces current account imbalances to adjust. However, the adjustment period of current account imbalances is not instantaneous as adjustment of capital account and leads to balance of payment crisis. Hence, sustainability of current account deficits is highly dependent to capital inflows (Edwards, 2008).

Large and persistent current account deficits are dangerous independently of how they are financed (Calvo, 1998). A sudden stop in capital flows leads to a reversal in current account deficits, bearing in mind that current account deficit is equal to domestic
demand minus gross national income. Consonant with reversal in current account deficits, domestic demand to tradable and nontradable goods declines. Decrease in domestic demand to nontradable goods causes a decline in growth - employment levels and real depreciation of the currency due to decrease in relative price of nontradable goods to tradable goods (Calvo & Reinhart, 2000).

The second capital account oriented approach emphasizes the crisis prone nature of financial markets (Arestis & Glickman, 2002; Dymski, 2010; Kregel, 1998; Onaran, 2006). According to that approach, a high and persistent current account deficit is a sign of speculation-led economic growth, induced by capital inflows.

According to Grabel (1995), financial liberalization causes “risky investment practices, shaky financial structures and ultimately lower rates of real sector growth” (Grabel, 1995, p.129). Domestic financial liberalization contains three main components: an increase in real deposit and loan interest rates to their free market level, deregulation of financial institutions and dismantling of governmental channels over credit allocation and finally creation of new types of private financial institutions, instruments and markets (Grabel, 1995). Domestic financial market liberalization affects the economy through two channels: demand and supply side effects.

Demand side effects are “higher loan interest rates attract an adverse class of borrowers; institutional innovations generate new opportunities for short term, speculative investment practices, which will be exploited by a broad class of investors; and finally the interest rate spread is likely to increase, biasing investment toward short term speculative investments” (Grabel, 1995, p.134). Supply side effects of domestic
financial liberalization are boom euphoric expectations, increasingly competitive climate, dampened credit rationing (Grabel, 1995).

Demand and supply side effects of financial liberalization lead speculative-led economic growth. This type of economic growth leads several consequences. Firstly, investments which are highly risky and have higher returns become dominant and low risk – low expected return investments are discouraged. Secondly, economy becomes more vulnerable to financial crisis due to disruptive effects in the real sector (Grabel, 1995). Thirdly, speculative-led economic growth exposes the economy directly to unproductive profit seeking investments.

International financial liberalization imposes exchange rate risk on aforementioned crisis prone structure. Arestis and Glickman (2002) develop a Minskyan open economy analysis. Increased profitability with respect to the cost of capital, due to hedge financing domination over the domestic economy, reduces the risk assessment and induces a growth in confidence. In an open economy, those positive developments would spread abroad and turn the attentions of international portfolio investors to domestic economy. On the condition of lower short term interest rates in major financial centers, liquid funds of foreign investors are switched into domestic currency. Increasing demand for domestic currency due to high real interest rates causes a real appreciation of domestic currency (Arestis & Glickman, 2002). Appreciation of domestic currency leads trade deficits and hence further current account deficits. These external imbalances are interpreted as evidence of economic health and that fuels euphoric expectations (Arestis & Glickman, 2002). Finally, increased interest - exchange rate arbitrage makes capital inflows sustained and growth gradually becomes dependent on cheaply imported goods.
The aforementioned boom cycle makes domestic economy prone to financial crises which can be originated domestically, externally and from “crisis intensifying interactions” between both of them (Arestis & Glickman, 2002, p. 243).

Aforementioned boom in growth ends with reversal in risk perception of investors, due to increased interest rates in order to justify depreciation risk pertaining to external imbalances. (Onaran, 2006) Consequently, capital inflows start to decline and the current account is forced to adjust. Due to tardy adjustment of current account balances, speculative-led economic growth tends to decline and economy is faced with a balance of payment crisis or current account reversal associated with decline in growth rates.

Several indicators are developed in order to show aforementioned crisis prone structure. In chapter five, those indicators are constructed on the base of Turkish Data and checked whether those data are coherent with current account reversals of Turkey.
CHAPTER III

TURKISH EXPERIENCE WITH CURRENT ACCOUNT DEFICITS

It is substantial to observe whether reversals in current account deficits constitute a major problem for Turkish economy. Uygur (2004) underlines that all of the crises of the Turkish economy (1994-1999-2001) spring from the high current account deficits. Adjustment periods of high current account deficits mostly have associated with decline in growth rates at Turkey. Table 1 illustrates the impact of current account reversals on economic growth. A reversal in current account deficit is defined by Edwards (2002) as a reduction in the deficit of at least 3 % of GDP in 1 year.

Table 1: Current Account Reversal and Growth in Turkey (TCMB)

<table>
<thead>
<tr>
<th>Years</th>
<th>Reversals</th>
<th>Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>-3.03</td>
<td>7.65</td>
</tr>
<tr>
<td>1994</td>
<td>6.94</td>
<td>-4.67</td>
</tr>
<tr>
<td>1995</td>
<td>-2.93</td>
<td>7.88</td>
</tr>
<tr>
<td>1996</td>
<td>-0.05</td>
<td>7.38</td>
</tr>
<tr>
<td>1997</td>
<td>-0.11</td>
<td>7.58</td>
</tr>
<tr>
<td>1998</td>
<td>1.72</td>
<td>2.31</td>
</tr>
<tr>
<td>1999</td>
<td>-1.17</td>
<td>-3.37</td>
</tr>
<tr>
<td>2000</td>
<td>-3.37</td>
<td>6.77</td>
</tr>
<tr>
<td>2001</td>
<td>6.98</td>
<td>-5.70</td>
</tr>
<tr>
<td>2002</td>
<td>-1.89</td>
<td>6.16</td>
</tr>
<tr>
<td>2003</td>
<td>-2.27</td>
<td>5.27</td>
</tr>
<tr>
<td>2004</td>
<td>-1.76</td>
<td>9.36</td>
</tr>
<tr>
<td>2005</td>
<td>-1.61</td>
<td>8.40</td>
</tr>
<tr>
<td>2006</td>
<td>-1.89</td>
<td>6.89</td>
</tr>
<tr>
<td>2007</td>
<td>-0.96</td>
<td>4.67</td>
</tr>
<tr>
<td>2008</td>
<td>-0.48</td>
<td>0.66</td>
</tr>
<tr>
<td>2009</td>
<td>4.55</td>
<td>-4.83</td>
</tr>
<tr>
<td>2010</td>
<td>-4.59</td>
<td>9.01</td>
</tr>
</tbody>
</table>
Table 1 illustrates the impact of current account reversals on economic growth. In 1994, 2001 and 2009 Turkish economy experienced fiscal, currency and financial crises accompanied with high current account reversals due to capital outflows. The link between economic growth and current account reversals in Turkey is illustrated by Yeldan (2006). Yeldan underlines that overvaluation of Turkish Lira, provided by high capital inflows, financed the costs of high growth rates through cheap imports; on the other hand overvaluation has accelerated revenues of speculative actions in financial markets. Those speculative boom expansions have not sustained and resulted in crisis.

Strong relationship between current account reversals and economic growth made sustainability of current account deficits major concern among economists in Turkey.
CHAPTER IV

NOTION OF CURRENT ACCOUNT SUSTAINABILITY

AND CONVENTIONAL INDICATORS

Notion of sustainability is widely used within the framework of development theory. Sustainable development mainly refers to a development path which effectively prevents the world from a nature led crisis due to excessive exploitation of natural resources. But in discussions related with current account deficits, that term means how long high current account deficits can be sustained without a balance of payments crisis. More accurate definition is given by Roubini and Wachtel (1998) as:

To specify an operational definition of sustainability, consider a situation where current macroeconomic conditions continue (i.e. there are no exogenous shocks) and there are no changes in macroeconomic policy. In this instance the current account deficit can be argued to be sustainable as long as no external sector crisis occurs. (Roubini & Wachtel, 1998, p.5)

Several indicators have been calculated in order to measure sustainability of current account deficits. Freund (2005) analyzes the 25 episodes of current account adjustments among industrialized countries and underlines a 5 % current account-GDP ratio as a threshold. Beyond that threshold, current account reversals tend to substantiate and income starts to decline. Dornbusch (2002) identifies the same threshold as 4 % current account-GDP ratio accompanied with 25 % real appreciation of local currency. Evidence shows that small current account-GDP ratios may lead to policy shifts or
balance of payments crisis while some countries like Australia have sustained their high current account deficits for a long time. As a result, current account-GDP ratios became weak criteria in order to evaluate the sustainability of current account deficits.

The current account balance is a very complex indicator. On the one hand a current account deficit can be an indicator of an economy’s strength if it reflects the resources coming into country with the aim of financing investment demand. On the other hand, the same current account deficit can reflect an unsustainable imbalance between national savings and domestic investments; hence accumulation of debts that cannot be serviced (Roubini & Wachtel, 1998). With the aim of solving that dichotomy, several methods and models have been built.

Milesi-Ferretti and Razin (1996a) established the notion of current account sustainability on the basis of intertemporal solvency which is highly related to willingness of international investors to lend and willingness of domestic investors to pay. They present several indicators which give important information about the sustainability of current account deficits. All indicators are about structural features, macroeconomic policy stance, political instability and market expectations about the country. Roubini and Wachtel (1998) extended those indicators with relevant information about periphery countries. In the next part, those indicators will be investigated intensively with the data from Turkey.

**Conventional Current Account Sustainability Indicators**

In this section some operational indicators of current account sustainability will be investigated with respect to data from Turkey between 1989 and 2010. Three boom-bust cycles of Turkish economy will be illustrated with respect to those indicators and
finally it will be checked whether conventional indicators can explain sustainability of current account deficits at Turkey.

Roubini and Wachtel (1998) built up operational sustainability indicators. Indicators can be grouped as “sources of current account deficits, composition of the current account, composition and size of the capital inflows, real exchange rate appreciation, foreign exchange reserves and the debt burden, fragility of financial system and finally political instability and uncertainty about the economic environment” (Roubini & Wachtel, 1998, p.5).

**Sources of Current Account Deficits**

Current account deficit is equal to difference between national savings and national investments. And sustainability of given current account deficit is dependent on its source – increase in investments or decrease in savings (Roubini & Wachtel, 1998).

Composition of savings and investments is important in order to assess current account sustainability. National savings and national investments are composed of private and public savings and investments. And source of the current account deficits can be both private investment-saving gap and fiscal imbalance.

Increasing fiscal imbalances due to increasing public investments associated with decreasing public savings (Lawson Doctrine) poses an obstacle to sustainability of current account deficits. According to Mundell-Fleming Model, the increasing budget deficits lead to increase in demand through tax cuts or increasing government spending and consequently increase in demand results with higher interest rates and appreciation of local currency. Finally appreciation of local currency leads to a deterioration in current account balances. According to the aforementioned theoretical fact, decreasing public
savings associated with increasing public investments illustrates the unsustainable nature of current account deficits at Turkey.

Figures 1, 2 and 3 illustrate public savings – investments and public sector borrowing requirement as a percentage of GDP at three cycles. In the first and second periods, decline in public savings and public sector borrowing requirement associated with high public investments before current account reversals indicates the unsustainable nature of current account deficits in those periods. That evidence is compatible with conventional sustainability indicators.

Contrary to the first and second periods, improved fiscal balances stand out during third period. Stabilization programs under supervision of IMF were effective on fiscal balances of Turkey in the third period. Contractionary fiscal policies implemented during that period were the main factors of that situation. In contrast to improved fiscal balances, current account deficits tended to increase up to the highest levels in the economic history of Turkey.

Figure 1: Public Savings – Investments and PSBR (1988-1994)(www.dpt.gov.tr)
Figure 2: Public Savings – Investments and PSBR (1995-2001) (www.dpt.gov.tr)

Figure 3: Public Savings – Investments and PSBR (2001-2009) (www.dpt.gov.tr)
The second source of current account deficits is the private saving and investment gap. For Roubini and Wachtel (1998), increasing private investments associated with increase in savings has a crucial effect on current account sustainability. High private investment rates, especially in traded goods, provide increased productive capacity and hence potentially higher export revenues that can be serviced to future debt payments. As a result higher private investment rates could lead to more sustainable current account deficits. Meanwhile, decreasing private saving rates pose a risk on sustainability of current account deficits.

Current account deficits and growth rates are also an additional indicator for increasing investments. Current account deficits can become sustainable with higher growth rates. Higher growth rates give rise to future investments due to higher expected profitability (Roubini & Wachtel, 1998).

Figure 4 illustrates current account deficit, private savings and private investments as a percentage of GDP between 1988 and 2009. As illustrated, private savings are over private investments during the first (1988-94) and second (1995-01) periods and at the last period private investment exceeds private savings. According to conventional wisdom, during the first and second periods while private savings were over private investments, weak fiscal balances absorbed private savings and crowed out the private investments. But at the last period (2002-09) increasing private investments associated with decreasing saving rates and strong fiscal balances indicates that current account deficits seemed sustainable at that period. However at the last period, despite higher investment rates, current account reversed at the end of the period, which is the third biggest reversal in the history of Turkey.
Private investment ratios do not give us enough information in to make an assessment about current account sustainability. It is important to clarify whether investments accrued to tradable sectors or nontradable sectors, but it is impossible due to lack of data that differentiate private investments into investments that are accrued to tradable and nontradable sectors.

High growth rates accompanied with high current account deficits is another important conventional sustainability indicator. Figure 5 discloses that fact between 1988 and 2009. At three periods, the growth pattern of Turkey is highly dependent on current account deficits. However, at the last period frequency between current account imbalances and growth rates highly increased. High current account deficits accompanied with high growth rates pictured high current account deficits as sustainable, but again evidence shows the opposite. In order to establish a more strong assessment about the relationship between current account deficits and growth rates, contributions of major
demand components to GDP growth rates must be investigated. Four major demand components of GDP can be listed as change in stocks, total domestic demand, exports and imports. Among these major components, just export and import components indicate whether GDP growth makes a contribution to sustainable current account imbalances. High export demand contribution makes a country sustain its foreign debt services.

Figures 6 and 7 illustrate the contributions of major demand components to the GDP growth. Figure 6 is calculated by constant 1987 prices while Figure 7 is by constant 1998 prices.

Contributions of net foreign demand to GDP growth have always been negative during all periods. Contribution of export demand to GDP growth has been effective but relatively too many less than the negative contribution of import demand and positive
Figure 6: Major Demand Contributions to GDP Growth Between 1988 and 2001 (www.tcmb.gov.tr)

Figure 7: Major Demand Contributions to GDP Growth Between 2002 and 2010 (www.tcmb.gov.tr)
contribution of total domestic demand. This event is the combined result of financial liberalization and overvalued currency-high interest rate policy, which has been adopted. Cheap import prices and easy finance of them through high capital inflows encouraged total domestic demand. As a result the highest contribution to GDP growth has been made by total domestic demand due to cheap import prices and high capital inflows. Contribution of export demand has not been effective on GDP growth, and hence increasing GDP growth rates cannot be a consistent indicator of current account imbalances of Turkey.

To sum up, conventional indicators those are derived from perspective which treats current account deficit as domestic saving-investment gap, have explanatory power on sustainability of current account deficits during the first and second periods, while those indicators failed in the last period due to high investment and growth rates associated with increasing current account deficits.

Composition of Current Account Balance

According to balance of payments accounting method, current account consists of three major accounts which are goods and services, income and current transfer accounts. Goods and services account mainly summarizes the net export of the country. Income account gives amount of payments to foreign production factors and income acquired from abroad by national production factors. And lastly, current transfers account illustrates the transfers “that do not involve (i) transfers of ownership of fixed assets; (ii) transfers of funds linked to, or conditional upon, acquisition or disposal of fixed assets; (iii) forgiveness, without any counters being received in return, of liabilities by creditors” (IMF, 1993, p.74).
Composition of those accounts gives important information about the sustainability of current account imbalances. If large trade deficits are dominating the income and current transfer balances, current account imbalances may be less sustainable. High and persistent trade deficits may be the result of structural competitive problems and its effects combined with given large and negative net foreign factor incomes, can impose a risk on solvency of the country and sustainability of current account imbalances. According to conventional wisdom, increasing export-GDP ratios is a sufficient indicator of current account sustainability due to the fact that increasing export rate strengths solvency conditions of the country. Figure 8 illustrates the import-GDP, export-GDP and export’s coverage ratio to imports.

Figure 8: Import (%GDP), Export (%GDP) and Export/Import Ratios Between 1991 and 2010 (www.dpt.gov.tr)
As can be seen from Figure 8 export-GDP ratio has been increased substantially in the post-1990s period. As a conventional sustainability indicator, high export-GDP ratios refer to degree of openness of the country, and hence more open economies can sustain high and persistent current account deficits (Milesi-Ferretti & Razin, 1998). In contrast to the conventional wisdom, despite increasing export-GDP ratios, Turkey has not sustained her current account deficits and has experienced three big current account reversals associated with balance of payments crises. Trade deficits are more coherent indicators for making assessment on sustainability of current account deficits. Figure 9 informs about current account composition.

As illustrated in Figure 9, the share of trade deficits increased drastically after 2001. Before 2001, each component had its fair share, but after 2001 the current account deficits have been mainly driven by trade deficits.

Figure 9: Composition of Current Account Between 1991 and 2001 (www.dpt.gov.tr)
Boratav (2010) underlines increasing dependency of Turkish industry on imports as a major factor of persistent current account deficits since 2001. Increasing export of manufactured goods and import of intermediate goods associated with almost stable value added ratios of manufacture sector indicates import dependency of industrial sector. Table 2 and Table 3 summarize the aforementioned fact.

Increase in manufactured goods exports has been associated with increase in intermediate goods imports in Turkey. But that fact has not contributed to an increase in value added by the manufacturing sector. As in the case of the manufacturing sector, high trade deficits do not contribute to the growth or increase the export potential of Turkey. Finally increasing growth rates of Turkey mainly after the 2001 period failed to indicate the current account reversal and sustainability of current account deficits.


<table>
<thead>
<tr>
<th></th>
<th>Manufact. (%GDP)</th>
<th>Import Inter. (%GDP)</th>
<th>Export Man. (%GDP)</th>
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<tbody>
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<tr>
<td>2010</td>
<td>24,2</td>
<td>17,9</td>
<td>14,4</td>
</tr>
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</table>

Real Exchange Rate Appreciation

One of the important conventional indicators of current account sustainability is the real exchange rate appreciation. Effects of real exchange rate appreciation on sustainability of current account imbalances are mixed and highly related with the source of real exchange rate appreciations, misalignment or not.

Firstly, if real exchange rate appreciation arises from high capital inflows due to higher real interest rates implemented, persistent real exchange rate appreciation does not indicate sustainability of current account deficits. This type of real exchange rate appreciation leads to an increase in consumption through cheapened imports and deteriorates export competitiveness and increasing vulnerability to crises. Milesi-Ferretti and Razin (1996a, 1996b) underline the importance of foreign exchange rate regime on real exchange rate appreciation. According to conventional approaches, flexible exchange
rate regime puts a discipline on the current account behavior and capital inflows (Ozmen, 2002). Therefore, flexible exchange rate regime is an important conventional indicator for current account sustainability.

Secondly, real exchange rate appreciation may be the reflection of the major changes in the fundamentals of the economy, such as productivity shifts at overall economy, known as the Balassa-Samuelson effect. The Balassa-Samuelson hypothesis expounds that long run foreign exchange rates are determined by relative price changes in tradable and nontradable sectors. And changes in prices between those sectors are driven by productivity differences between those sectors, though increasing productivity in tradable sectors results in higher real exchange rates (Balassa, 1964).

Figure 10 illustrates the evolution of real exchange rates and current account deficit as a percentage of GDP. During all periods, real exchange rates increased (appreciated) persistently, but relationship between current account deficits and real exchange rates is more complex. Current account deficits had increased substantially

![Figure 10: Real Exchange Rates and Current Account Deficits Between 1995 and 2001](www.tcmb.gov.tr and www.dpt.gov.tr)
1 year before the crises occurred. In contrast to preceding periods, during the last period high real exchange rates accompanied high current account deficits. When increasing shares of trade deficits are taken into consideration, this fact seems coherent.

Over the course of the first and second periods, there is no persistent relationship between real exchange rates and current account deficits, while in the last period that relationship is persistent due to increasing trade deficits. According to the conventional notion of sustainability, throughout the first and second periods, real exchange rates do not perform effectively in order to indicate current account reversals. Real exchange rates indicate the unsustainable nature of current account deficits only when increase in current account deficits is driven by increase in real exchange rates, as in the last period.

Source of the increase in the real exchange is also important in order to make an assessment about relationship between current account sustainability and real exchange rates. Surge in real exchange rates are mostly justified through increasing productivity in manufacturing sector due to its high shares on exported goods. Index of production per hour worked in the manufacturing sector increased almost 100% between 1988 and 1997, 65% between 1997 and 2006 and 20% between 2005 and 2006 (according to new series). Akcay and Ucer (2008) underline that increased productivity in the manufacturing sector cannot indicate the productivity growth in tradable good sectors. Akcay and Ucer exercise a coherent real exchange rate index which is more relevant to the Balassa-Samuelson effect as the ratio of service to tradable sectors and takes productivity differences between tradable and nontradable sectors. According to that calculation, real exchange rate increased just 10% while relative productivities of service and manufacturing sectors almost stable between 2000 and 2008. As a result, the Balassa-
Samuelson effect does not have a major contribution to real exchange rates in Turkey. Ciplak (2007) finds that real exchange rate is driven by nontradable sector’s relative prices in Turkey while that fact is not due to productivity differences between nontradable and tradable sectors; it is more relevant to nominal shocks against the exchange rate.

Exchange rate policy stance is the last conventional indicator of current account sustainability which is relevant to real exchanges. Turkey implied many exchange rate regimes. According to Reinhart and Rogoff’s (2004) exchange rate regimes classification, Turkey implemented managed float regime between 1981 and 1999; free floating regime between 1999 up to now. Under those exchange rate regimes Turkey experienced three current account reversals. Consequently, free exchange regimes cannot prevent the exchange rate misalignments and cannot indicate current account sustainability. To sum up, real exchange rate appreciation under free exchange rate regimes failed to indicate sustainability of current account deficits properly.

Foreign Exchange Reserves and Foreign Debt

The current account deficit is defined as the difference between national investment and savings which must be financed by accumulation of debt or capital inflows. Sustainability of current account deficits is highly related to sustainability of debts, since current account sustainability is defined as intertemporal solvency of a country. High debt burden imposes several constraints on economic growth, such as the fact that high debt service and interest payments can drain the export revenues of the country and restrict the transfer of income to the productive investments. Debt sustainability of a country is dependent on income generated in the future. In order to
assess the debt sustainability of a country, several frameworks are developed. World
Bank developed six operational indicators about sustainability of external debts on the
base of solvency criteria (Kappagoda, 2007). These can be listed as:

- Ratio of total debt service to exports of goods and services
- Ratio of interest payments to exports of goods and services
- Ratio of total external debt to exports of goods and services
- Ratio of total external debt to GNP
- Ratio of present value of external debts to GNP
- Ratio of present value of external debts to exports of goods and services

(Kappagoda, 2007; Ajayi, 2000)

In addition to the aforementioned measures, maturity of the debts and foreign
exchange reserves are also an important element in assessing the external debt
sustainability of a country on the base of liquidity criteria (IMF, 2003). High short term
debts relative to total debts and lower levels of foreign exchange reserves relative to short
term external debt refers to unsustainable debts. Those several practical measures indicate
the strength of the economy against debt repayments and they shape the lenders
expectations about domestic economy’s prospect.

Figures 11, 12, 13 and 14 summarize data about first four external debt indicators.
Due to lack of data about the present value of external debts last two indicators are not
illustrated.

Figure 11 summarizes ratio of total external debt to exports of goods and services.
That ratio is used as a measure of debt sustainability, since increasing debt to exports
ratio indicates that total debts grow faster than the country’s basic source of income for a
Figure 11: Total External Debt (%Exports of Goods and Services) Between 1985 and 2010 (www.dpt.gov.tr)

Figure 12: Total External Debt (%GNP) Between 1985 and 2010 (www.tcmb.gov.tr)
Figure 13: Interest Payments (%Exports) Between 1985 and 2010 (www.tcmb.gov.tr)

Figure 14: Interest Payments (%Exports) Between 1985 and 2010 (www.tcmb.gov.tr)
given interest rate (IMF, 2003). Critical threshold for ratio of total external debt to exports of goods and services is determined as 250 % with respect to calculations made on the basis of Global Development Finance Indicators of World Bank (Kappagoda, 2007). During periods of post 1980s–1994 and 1995-2001 debt-to-export ratios of Turkey are all higher from highly indebted limit. Before 1994 and 2001 current account reversals, debt-to-export ratio increased while that ratio mildly decreased before the last current account reversal. Consequently, high debt-to-export ratios are not eligible for assessing sustainability of current account deficits.

Figure 12 illustrates total external debt as a percentage of GNP between 1985 and 2010. Debt-to-GNP ratio provides useful information about whether a country is able to service its debts by channeling resources from production of domestic goods to the production of tradable goods (IMF, 2003). Debt-to-GNP ratio must be evaluated in conjunction with debt-to-export ratio and value added share of export in GDP. Low debt-to-GNP ratios accompanied with high debt-to-exports ratios and almost stable export-GDP ratios pose a problem about debt sustainability and hence current account sustainability. According to World Bank calculations based on the aforementioned notion, external debts higher than 50 % of GNP impose high risks on solvency of a country (Kappagoda, 2007). Debt-to-GNP ratio of Turkey exceeded that threshold in just 3 years. During the periods post 1980-1994 and 1995-2001, debt-to-GNP ratio exceeded just in years 1994, 2001 and 2002 when current account reversal occurred. And after the last current account reversal (2009), debt-to-GNP ratio has not exceeded the high risk threshold. As a result, debt-to-GNP ratio measure is not a sufficient indicator about sustainability of current account deficits as other conventional indicators.
Debt service as a percentage of exports of goods and services is represented in Figure 13. Debt service payment is composed of principal and interest payments for long term and short term debts. Debt service-to-export ratio is the portion of export revenues of a country that is used up in servicing its debts. Moreover, that measure indicates the vulnerability of debt service obligations to an unanticipated fall in export revenues (IMF, 2003). Debt services that exceed 30% of export revenues must be considered risky according to calculations of World Bank (Kappagoda, 2007). Turkey exceeded that threshold every year during the post-1980s period and experienced three current account reversals in the same period. Debt service-to-exports ratio dramatically increased in years when current account reversals occurred, due to a dramatic fall in export revenues. In the last period (2002-2009) Turkey run into current account reversal in conjunction with low debt service levels. As can be seen from Figure 4.19, debt service ratio must be an ex-post indicator; it just reflects the movements in the current account instead of indicating current account reversals.

The last solvency indicator is interest payments as a percentage of export earnings and manifests terms of domestic economy’s external indebtedness and thus the debt burden. Thresholds for interest payments ratio are calculated as 20% for high indebtedness and 12% for less indebtedness. Figure 14 manifests evolution of interest rate payments ratio to exports since 1985. Turkey experienced current account reversals at all indebtedness levels. At 1994, current account reversal Turkey was a highly indebted country, moderately indebted country at 2001 reversal and lastly was a less indebted country at 2009 current account reversal. As a result, the indebtedness level of Turkey is
independent of current reversals experienced. Consequently, interest payments-to-exports ratio is incapable of indicating current account reversals in Turkey after 1980s period.

Debt sustainability indicators according to liquidity terms can be listed as ratio of international reserves to short term debt and ratio of short term debt to total external debt. Figure 15 summarizes those ratios during the period between 1985 and 2010.

International reserves-to-short term debt ratio is the most important indicator of reserve adequacy of a country (IMF, 2000). It mainly shows whether a country can pay at least its short term debts during the period of current account reversal. According to IMF (2000), foreign exchange revenues must not fall behind the short-term external debts. As can be seen from Figure 15, after 1987, foreign exchange reserves have not been under a 100 % level. It mainly exposes that Turkey imposes a strong position against external shocks. However, that strong position of Turkey could not restrain the current account reversals and hence the capital outflows.

Figure 15: Foreign Exchange Reserves as a Percentage of Short Term Debts and Short Term Debts as a Percentage of Total Debts Between 1985 and 2010
Short term debt-to-total debts ratio denotes reliance on short term financing and thus provides information about future repayment risks (IMF, 2003). As illustrated in Figure 15, short term debt-to-total debt ratios gradually increased before first and second current account reversal (1994 and 2001). But before the last current account reversal (2009), that ratio was quite low with respect to preceding current account reversals. Milesi-Ferretti and Razin (1998) also discredit that ratio since it is found that there is no significant relationship between short-term debt-to-long term debt ratio and balance of payments related crisis.

Debt sustainability indicators, both solvency and liquidity indicators, cannot account for current account reversals since they are almost out of step with each other during periods before current account reversals occurred in Turkey at 1994, 2001 and 2010.

Fragility of Financial System

Financial system soundness, especially the banks, is another important indicator for making an assessment about a country’s current account sustainability. There are several financial soundness indicators that are determined by IMF. Financial soundness indicators represent capital adequacy, asset composition-quality and profitability of banks and core indicators are listed as capital adequacy ratio, ratio of nonperforming loans to total loans, ratio of net income to average total assets and ratio of net income to average total equity.

Capital adequacy and availability determines the strength of banks against shocks to their balance sheets. Aggregate risk based capital ratios, such as regulatory capital to risk weighted assets, are used in order to present that concept. According to Basel I
criteria, capital adequacy ratio cannot be under the 8 % (IMF, 2006). Decrease in the position of capital adequacy ratio represents “increased exposure to risk and possible capital adequacy problems” (IMF, 2006, p.155).

Solvency risks of banks and financial institutions can be measured through quality of assets that are held by banks and financial institutions. Ratio of nonperforming loans (NPL) to total loans is used as a proxy for asset quality and constitutes one of the core financial soundness indicators (IMF, 2006). Increase in that ratio increases banks’ exposure to risk and though banks confront solvency problems.

Profitability of banks is another aspect of financial soundness and most common indicators in order to assess bank’s profitability are ratio of net income to average total assets (known as return on assets) and ratio of net income to average equity (known as return on equities) (IMF, 2006).

Tables 4 and 5 summarize core financial soundness indicators for Turkey: capital adequacy ratio, NPLs-to- total loans, return on assets and return equities, during the period between 1990 and 2009.

Table 4: Core Financial Soundness Indicators Between 1990 and 1999

<table>
<thead>
<tr>
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<th>Return on Assets</th>
<th>Return on Equities</th>
<th>NPLs (%Total Loans)</th>
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Table 5: Core Financial Soundness Indicators Between 2000 and 2009

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<tr>
<th>Year</th>
<th>Return on Assets</th>
<th>Return on Equities</th>
<th>NPLs (%Total Loans)</th>
<th>Capital Adequacy Standard Ratio</th>
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The first core financial soundness indicator is capital adequacy ratio. Regulations about capital adequacy standard ratio were legislated in 2002 and it has been calculated since 2002 monthly by Banking Regulation and Supervision Agency in Turkey. Consequently there are no available data later than 2002. Capital adequacy ratio fluctuated between the range of 18 % and 31 % which is quite a bit higher than the Basel I criteria, 8 %. While capital adequacy ratio presented the strength of the banking system, the last period ended up with current account reversal associated with a shrink in economic growth.

Secondly, return on assets and return on equities give information about profitability of banking sector. As summarized in Tables 4 and 5, during the pre-1994 period, those two ratios were increasing and before 1994, highest levels of profitability were reached. After 1994 crisis, an upward trend in profitability of banks decreased in 2000 dramatically due to banking sector crisis and followed by balance of payments crisis in 2001. And in the last period (2002-2009), profitability levels of the banking
sector have stabilized and posed a strong position. In spite of strong profitability of banking system, current account deficits were not sustained.

Thirdly, in order to assess on asset quality of banks, ratio of nonperforming loans (NPL) to total loans is commonly used. According to Tables 4 and 5, during the period of pre-1994, nonperforming loans do not exceed 10% of total loans and 2002-2009 that ratio decreased gradually during the period except 2009. So, in the first and last period asset quality of banks performed well. However, in the period of 1995-2001 nonperforming loans-to-total loans ratio increased dramatically in the last period due to the banking crisis and continued to increase up to 2001 by balance of payment crisis.

Lastly, fluctuations in financial soundness cannot reflect current account sustainability in Turkey, due to its inconsistent relationship with current account reversals. Turkey experienced two current account reversals (1994 and 2009) inconsonant with a strong financial stance and one current account reversal (2001) that is led by the banking crisis (2000). To sum up, financial soundness is insufficient for making assessment on current account sustainability in Turkey.

Composition and Size of the Capital Inflows

The last conventional current account sustainability indicators are grouped as composition and size of the capital inflows. According to conventional wisdom, composition of capital inflows required to finance current account deficits is important determinant of sustainability (Roubini & Wachtel, 1998).

Firstly, current account deficits, financed through foreign direct investments (FDI), are considered more sustainable than those financed by portfolio investments. Secondly, equity inflows are praised against debt creating inflows due to the fact that
equity inflows are more stable than debt creating inflows. Figures 16 and 17 summarize aforementioned indicators during the period between 1989 and 2010.

Figure 16 discloses net direct and net portfolio investments between 1989 and 2010. Before 2001 capital inflows had taken place by mostly portfolio investments and reflect the vulnerability of external balances due to the highly volatile nature of portfolio investments. However, after 2001 foreign direct investments have increased dramatically and exceeded portfolio investments in quantity by 2005 which must improve the vulnerability of external imbalances in terms of conventional notion of current account sustainability. Increased proportion of foreign direct investments could not prevent 2009 current account reversal and those investments decreased 59.5% during that period. This fact discloses that an increased portion of foreign direct investments before the 2009 reversal negates conventional arguments which point out the importance of high foreign direct investments in order to sustain high current account deficits.

Figure 16: Net Direct and Net Portfolio Investments Between 1989 and 2010 (www.tcmb.gov.tr)
Portfolio inflows are composed of equity and debt securities. Both of them have relative advantages to each other. Debt securities have influential effects on domestic investment and hence economic growth, while equity securities provide lower fluctuations in domestic consumption (Lachler & Nunnenkamp, 1987). But after default of periphery economies after international debt and currency crises, equity securities tended to be favored due to their stable nature. According to intertemporal solvency notion, increasing equity securities share is an important indicator of current account sustainability.

Figure 17 shows composition of liabilities account of portfolio investments. During the whole period, debt securities dominate equity securities (except 2007 and 2009) which exposes domestic economy to vulnerability risk of external balances.

It is shown that conventional indicators about capital flows are insufficient for making assessments about current account sustainability, since their arbitrary fluctuations before current account reversal periods. The main underlying reason is conventional categorizations of capital inflows. Capital flows are categorized according to their levels

![Figure 17: Equity and Debt Securities Between 1989 and 2010](www.tcmb.gov.tr)
of volatility. However, recent studies assert the opposite of conventional wisdom. Neumann et al. (2009) find that financial liberalization leads to higher volatility in foreign direct investments relative to preliberalization period. Broto et al. (2011) find that in the presence of global economic indicators foreign direct investments are as volatile as portfolio investments. Claessens et al. (1995) cannot find inherent time series features of short term or long term capital flows.

**Overall Effectiveness of Conventional Indicators**

In Chapter IV, it is found that those indicators do not inform us about current account sustainability of Turkey, due to arbitrary fluctuations of conventional indicators during preceding periods of current account reversals. However some structural indicators have potential for giving information about current account sustainability of Turkey.

Structural high trade deficits experienced by Turkey during the preceding years of current account reversals are the first coherent conventional indicator about current account sustainability. Import dependency of manufacturing sector and quite low contributions of export demand to the GDP growth of Turkey disclose the structural features of trade deficits of Turkey. However, increasing trade deficits may be the outcome of a speculation-led economic growth rather than structural problems.

High capital flows experienced during preceding years of current account reversals stand as a second coherent indicator. Despite conventional emphasis on importance of composition of capital flows, data from Turkey disclose the opposite. Turkey experienced three current account reversal periods, which are 1994, 2001 and 2009. As illustrated in Figure 16, during the preceding years of current account reversal,
different types of foreign investments dominated capital flows. While portfolio investments are dominant during the first and second periods, foreign direct investments are dominant during the last period. However throughout all periods, gradual increase in capital flows is remarkable before current account reversals.

In the Chapter VI, causality tests will be done in order to test aforementioned interactions between current account balances and capital flows. Results will inform about whether current account deficits reflect structural problems of the domestic economy or those problems are the results of increased capital flows to domestic economy, which is called speculation-led growth.
CHAPTER V

CAPITAL ACCOUNT ORIENTED INDICATORS

Capital account oriented indicators are based on speculative-led economic growth theory. According to that theory, liberalization of domestic financial markets stimulates speculative investments and deters the financially hedged investments, by increasing interest rates and creates a speculative-led economic development-growth (Grabel, 1995). Additionally, international financial liberalization imposes foreign exchange rate risks on that crisis prone structure. Massive upsurge in capital inflows increases demand for financial assets and hence leads real exchange rate appreciation. Real exchange rate appreciation makes imported goods cheaper and growth gradually becomes dependent on cheap imports. Capital inflows and so speculative-led economic growth are sustained by increasing financial arbitrage revenues that are composed of interest and exchange rate revenues. The aforementioned cycle ends with the reversal in capital flows. Reversal in capital flows forces current account imbalances to adjust. During the adjustment period of current account imbalances, growth rate decreases dramatically due to import dependency of growth.

High and persistent current account deficits reflect high capital inflows to country. Speculative-led growth causes increasing trade deficit due to import dependency of growth. Current account reversals are simply reversals in capital flows. According to that view current account deficits are led by capital inflows and in order to achieve current
account sustainability, capital flows must be sustained by regulations imposed on capital flows.

In this chapter several indicators, relevant to the aforementioned structure, are illustrated and examined to determine whether those indicators are consistent with major current account reversals of Turkey. Paula and Alves (2000) developed an external financial fragility index which helps to evaluate country’s “dependence on refinancing in order to sustain the stability of its balance of payments and any given exchange rate” (Paula & Alves, 2000, p.598).

External financial fragility index compares the economy’s “actual and potential foreign currency liabilities with respective payment capacity” (Paula & Alves, 2000, p.598). External financial fragility index is calculated as:

\[
EFI = \frac{M + D_i + D_{OS} + A + STC_{-1} + NIP_{-1}}{X + R_i + R_{OS} + AR_{-1} + FDI + L_{ml}}
\]

The numerator of external financial fragility index stands for actual and potential currency liabilities and is composed of imports (M), expenditures on interest (D_i) and other services (D_{OS}), loan amortizations (A), stock of net investment in portfolio with a 3-month lag (NIP_{-1}) and short term capital stock with a 3-month lag (STC_{-1}). The denominator of external fragility index stands for payment capacity of the domestic economy and it is composed of export revenues (X), revenues from interest (R_i) and other services (R_{OS}), aggregate official reverses with a 3-month lag (AR_{-1}) foreign direct investments (FDI) and medium-long term loans (L_{ml}) (Paula & Alves, 2000).
High external financial fragility index refers to increasing fragile structure of domestic economy against capital flows and low ones refers to the relatively strong structure of domestic economy. Increasing external financial fragility associated with increasing growth rate can be shown as evidence of speculative-led economic growth.

Figure 18 illustrates external financial fragility index of Turkey between the first quarter of 1992 and the third quarter of 2011 calculated by balance of payments data, gathered from the Central Bank of the Republic of Turkey (CBRT).

Figure 18 discloses the speculative-led growth pattern of Turkey, after capital account liberalization, 1989. Growth rates are mostly associated with increasing external fragilities. Increasing imports and short term capital inflows result in external fragility and higher growth rates. Consequently, growth rates inherently increase the external fragility of Turkey, due to its speculative nature. The external fragility index also informs about current account reversals. Before three current account reversals associated with decline in growth rates (1994-2001-2009), external financial fragility index value peaks locally and due to high capital outflows it decreases dramatically.

Figure 18: External Fragility Index and Growth Rates of Turkey Between 1992 and 2011.
Short term capital flows to Turkey are mainly driven by high real interest rates and real exchange appreciation. High interest rates and real exchange rate appreciation fosters short-term, speculative capital inflows through high return on those inflows. Return on speculative, short term capital inflows can be calculated as:

\[ R_{si} = \frac{1 - i}{1 - e} - 1 \]

The aforementioned equation illustrates the return on short-term investments \((R_{si})\) per one Turkish Lira. According to that equation return on short-term investments is related positively to domestic interest rates \((i)\) and negatively to relative expected change in foreign exchange rate \((E)\). Figure 19 illustrates short-term capital inflows and return on those inflows. Interest rates are calculated from 3-month weighted bank deposit interest rates and the expected relative exchange rate change is calculated as realized change in exchange rate. These data are gathered from databank of CBRT.

Figure 19 displays the relationship between short-term foreign investments and return on those investments. As can be seen from the figure, short-term speculative foreign investments are driven by high return on those investments due to appreciated exchange and high interest rates. Correlation coefficient between short term foreign investments and return on those investments is 0.509745. A change in investors’ expectations about the sustainability of current foreign exchange rate policy leads to massive capital outflows and decreases the return on short-term investments. Consequently high massive capital flows lead to balance of payment crisis.
Interest rate differential between major economies and domestic economy are also an important indicator of speculative-led growth pattern of Turkey. Figures 20 and 21 compare interest rates experienced by Turkey with other major center and periphery countries. Due to lack of data, short term real interest rates are illustrated after 2000. Short term real interest rates are calculated on the base of monthly monetary and financial statistics of OECD, and nominal interest rates adjusted with annual inflation rate that is calculated again by OECD data.

Figure 20 and Figure 21 display short-term real interests of Turkey and other major OECD economies. Since 2001, Turkey’s short-term real interest rates constitute highest level among OECD countries. The high difference in Turkish short-term real interest rates from other economies makes short-term investments in Turkey more
Figure 20: Real Short-Term Interest Rates Experienced by Center OECD Countries and Turkey (2001-2009) (www.oecd.org)

Figure 21: Real Short-Term Interest Rates Experienced by Periphery OECD Countries and Turkey (2001-2009) (www.oecd.org)
profitable and stimulates short-term foreign investments.

Another important indicator of speculative-led growth is the real exchange rate appreciation and increasing imports of consumption and intermediate goods. Table 6 illustrates the correlation coefficients of consumption, investment and intermediate goods import and real exchange rate appreciation.

According to Table 6, intermediate and consumption goods are positively correlated with real exchange rate appreciation, while investment goods imports are negatively correlated. Real exchange rate appreciation stimulates the import of consumption goods and makes growth increasingly dependent on intermediate goods import in Turkey.

The relationship between Turkey’s current account deficits and growth rates is examined in Chapter 4. Increasing growth rates associated with high current account deficits are not a healthy indicator of Turkish economy and do not represent future export revenues. According to main demand contributions of growth in Turkey (illustrated in Figures 6 and 7), growth rates have been mainly driven through domestic demand and export demand has marginal contributions relative to domestic demand.


<table>
<thead>
<tr>
<th>Real Exchange Rate Appreciation</th>
<th>Investment Goods (%Imports)</th>
<th>Intermediate Goods (%Imports)</th>
<th>Consumption Goods (%Imports)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0,772128977</td>
<td>0,368113461</td>
<td>0,742203424</td>
<td></td>
</tr>
</tbody>
</table>
In this chapter, main indicators about speculative-led growth are examined. Growth rates experienced by Turkey after trade liberalization are dependent on mainly capital inflows. Growth in Turkey is inherently fragile and as illustrated in Figure 18, higher growth rates have been achieved at the expense of increasing external fragility. The main determinant of external fragility is short-term foreign investments. High returns on short-term foreign investments, demonstrated in Figure 19, have increased short-term foreign investment and hence increased the demand for domestic financial assets. The upsurge in short-term capital inflows leads to appreciation in real exchange rate and consequently results in increasing trade and current account deficits in Turkey. As a result, according to capital account oriented indicators, the main problem of the Turkish economy is the capital inflows and their speculative nature. Therefore high current account deficits are just a reflection of capital account surpluses. Sustainability of current account deficits is highly dependent on sustainability of capital inflows.

Overall Effectiveness of Capital Account Oriented Indicators

Turkey experienced three major current account reversals associated with dramatic fall in growth rates. As demonstrated in Figure 19, fluctuations of external financial fragility index are unique before major current account reversals. Before current account reversals, external fragility index increases, due to high short-term capital inflows and during the reversal period it decreases dramatically. However its relationship to growth rate is mixed. During the first period (first quarter of 1992 – first quarter of 1995) external financial fragility index is negatively correlated, but during the second (second quarter of 1995- last quarter of 2001) and third period (first quarter of 2002- third quarter of 2009), they are positively correlated. In contrast with correlation coefficients,
external financial fragility index is at locally peak level before decline in growth rates, and during recession periods it declines. High returns on short-term foreign investments also have unique fluctuations before major current account reversals.

In Chapter VI causal relationship between capital and current accounts will be investigated. Effectiveness of the capital account oriented indicators will be reviewed according to the results of the causality tests.
CHAPTER VI

CAUSAL RELATIONSHIP BETWEEN CURRENT AND FINANCIAL ACCOUNT BALANCES

The main discussion on sustainability of current account deficits has developed on the base of theoretical dichotomy, which are called “current account oriented” and “capital account oriented” views. According to the first approach, high and persistent current account deficits are the result of some structural problems about domestic economy, such as trade deficits, budget deficits, and saving-investment gap. According to the second approach, high and persistent current account deficits are just the reflection of massive capital inflows to domestic economy (financial account surplus) and hence current account sustainability can be achieved through sustained capital inflows. Several indicators are developed by both of those theoretical conceptions. In order to make a healthy assessment about current account sustainability of Turkish economy, causal relationship between current and capital-financial account balances must be investigated.

Balance of Payments Accounting

Balance of payments balance summarizes the foreign economic transactions of a country. Balance of payments account consists of two major accounts, except net error omissions which are called current and capital-financial accounts. Those accounts will be investigated in a detailed manner and possible causal relations will be examined.
Current Account (CA)

Current account balance summarizes the nonfinancial transactions of domestic agents with foreign ones. There are three major accounts which form the current account: goods and services, income and current transfers accounts. Goods and services account is the difference between exports and imports of goods and services. Income account is the difference between factor incomes received from abroad and factor payments to abroad. Lastly, current transfers account illustrates the transfers “that do not involve (i) transfers of ownership of fixed assets; (ii) transfers of funds linked to, or conditional upon, acquisition or disposal of fixed assets; (iii) forgiveness, without any counters being received in return, of liabilities by creditors” (IMF, 1993, p.74).

The sum of those subaccounts gives the current account balance and the current account is in deficit when the sum of those accounts is smaller than zero, while it is in surplus if the sum of aforementioned subaccounts is greater than zero.

Possible causal relationship between subaccounts and capital flows must be stated. Firstly, deficit in goods and services account can be the result of some domestic structural problems or main outcome of a speculative growth which is induced by capital flows. Increasing import dependency of Turkish manufacture sector is illustrated previously and that fact can be a structural problem of Turkey or again it can be induced by capital flows.

Secondly, income account balance summarizes the net factor income payments to abroad. It is composed of two subaccounts which are compensation of employees and investment. Compensation of employees account “covers wages, salaries, and other benefits, in cash or in kind, and includes those of border, seasonal, and other nonresident
workers” (IMF, 1993, p.40). Investment income covers the income earned by nonresidents (residents) from domestic (abroad) financial investments. And investment account is divided into three accounts which are direct investment account, portfolio investment account and lastly other investments account. Firstly, direct investment account summarizes the net income accrued to investors from ownership of direct investment (IMF, 1996). Secondly, portfolio investment account balance is the net income collected from financial investments (other than direct investments) by nonresidents (residents) from reporting country (abroad). Lastly, other investments income balance is the net interest income collected from deposits, loans and commercial loans. A deficit in income account is mainly induced by financial account. An increase in foreign investments must increase the payments to abroad in return for those investments.

The last subaccount of current account balance is current transfers. Current transfers are net unilateral transfers from abroad. Those transfers can be in kind of governmental (foreign aid, gifts and grants) and private transfers (workers’ remittances, other kind of private flows). Current transfers account has had surplus in Turkey due to high workers’ remittances from abroad. Average workers’ remittance share in current transfers is 0,758 while government transfers’ is 0,234 between 1991 and 2011. Current transfers account could not have significant relationship with capital flows. Relevant flows with current account transfers are mostly determined by various factors such as sociological factors.

To sum up, causal relations of subaccounts of current account balance with capital flows can be summarized as follow:
• Goods and Services Balance: Causality can be in both direction between capital flows and goods-services flows.

• Income Balance: Causality must be from capital inflows to income balance. Because increase in capital flows in both type, returns into payments abroad in the form of interest, profit and dividend payments.

• Current Transfers: There must be no causal relation between capital flows and current transfers.

Aforementioned causal relations will be tested at the last part of that section by Granger Causality tests.

Capital and Financial Account

Capital and financial account is composed of capital and financial accounts. Capital account shows “(a) capital transfers receivable and payable between residents and nonresidents and (b) the acquisition and disposal of nonproduced, nonfinancial assets between residents and nonresidents” (IMF, 2009, p.216). In line with the definition, capital account is divided into two parts: capital transfers and acquisition/disposal of nonproduced, nonfinancial assets. Capital transfers balance involves net unilateral transfers among residents and nonresidents related to fixed capital formation, like debt forgiveness and immigrant transfers etc. Acquisition and disposal of nonproduced, nonfinancial assets balance includes purchase and sale activities of nonproduced assets that are natural resources and of intangible assets like licenses, contracts, marketing assets. As regards capital account’s causal relation to current account, there must not be significant relationship between current account and capital account balances. The main reason is that transfers included in capital account do not create counter liability for
residents and nonresidents though it is not a sustained way of financing current account deficit.

Financial account summarizes financial assets and liabilities that take place between residents and nonresidents (IMF, 2009). Financial account classified according to functional and sectoral categories of financial investments. The first type of financial investments is foreign direct investments. Foreign direct investment is “a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy” (IMF, 2009, p.100).

Fry et al. (1995) analyze causal relationship between foreign direct investments and current account deficits among periphery economies. Fry et al. differentiate foreign direct investments with respect to their ability to change capital formation or to finance current account deficits. According to their analysis if foreign direct investments are independent from other types of capital flows, like portfolio and other investments, that type of investment increases the capital formation of a country rather than financing the current account deficits. Causal relationship between current account and foreign direct investments must be unidirectional due to foreign direct investments’ dual effect on balance of payments and capital formation of a country (Fry et al., 1995).

The second subaccount of financial account is portfolio investments. Portfolio investments can be briefly definable as investments in financial securities. Those investments are made in the form of purchasing government-private bonds, bills and equities. The most important feature of portfolio investments is that those investments are tradable. Portfolio investments provide flexibility for investors to sell securities before
their maturities (IMF, 1996). Due to the aforementioned fact that type of investments is quite dependent on interest rate differentials among countries, there is a direct causal relationship between current account and portfolio investments. According to current account oriented views causality is from current account to portfolio investments and according to capital account oriented views the causal relationship is totally opposite.

The third subaccount of financial account is other investments, which is the residual account that involves all of financial flows that are not considered as direct, portfolio and reverse assets. That account is composed of 5 subaccounts which are (1) trade credits, (2) use of at Fund credit and loans from the Fund, (3) other loans, (4) currency and deposits, and (5) other assets and liabilities (IMF, 1996). Trade credits are provided by suppliers to buyer, in order to finance goods and services trade due to time gap between the payment and transfer of the goods and services (IMF, 1996). Use of at Fund credit and loans from the Fund involves credits and loans provided by International Monetary Fund, to countries that faced with balance of payments problems. Those credits and loans are provided under certain conditions that are determined by IMF. Other loans are defined as:

Loans are financial assets created through the lending of funds by a creditor (lender) directly to a debtor (borrower); the lender receives no security evidencing the transaction or receives a nonnegotiable document or instrument. Included are loans (different from trade credits) to finance trade, mortgages, and other loans and advances. Financial leases and repurchase agreements are also considered loans (IMF, 1996, p.125).

Currency and deposits account summarizes the net currencies which are composed of foreign banknotes and coins issued by foreign countries and deposits of foreign exchange deposits held by residents. Lastly other assets and liabilities subaccount involves other financial assets and liabilities that are not classified above.
Causal relationship between other investments and current account is more complex than portfolio and foreign direct investments. The account mainly depends on conditional credits provided by IMF and export suppliers. That type of investments does not have a primary role in financing current account deficits. Consequently, there cannot be a causal relationship between current account deficits and other investments.

The last subaccount of financial account is reserve assets account. That account consists of “financial instruments available to the central authorities for financing or absorbing an imbalance of payments or for regulating the size of such imbalances” (IMF, 1996, p.129). Reserve assets are held for several reasons such as securing confidence, satisfying legal requirements, etc. Reserve assets do not continuously finance current account deficits as other balance of payments accounts. In that analysis reserve assets are not included to analysis.

Net Error and Omissions

The last account of balance of payments is net error and omissions account. Every transaction of balance of payments transactions is calculated by equal debit and credit records. Because of that current account balance and capital-financial account must be equal to each other in absolute terms. In practice that equality cannot be achieved, because derivation of data from various resources creates differences in record time, valuation and measurement. Net error and omissions account is simply residual of credit and debit records of balance of payments.
Causality Tests Between Capital Flows and Current Account Balances

In this section causal relations between current account balances and capital-financial account balances, between subaccounts of those major accounts will be tested by Granger Causality Tests. Causal relationship between current account and capital flows are analyzed by several studies (Yan, 2005, 2007; Yan & Yang, 2011; Fry et al., 1995; Wong & Carranza, 1999; Faroque & Veloce, 1990). Faroque and Veloce (1990) investigate the causal relationship between current account and capital-financial account balances of Canada during the period between 1961 and 1984. They find a feedback relation between current account and long term capital account. Wong and Caranza (1999) analyze causal relations between current and capital-financial account in four emerging countries which are Argentina, Mexico, Philippines and Thailand. According to their analysis before the mid-1980s, when capital mobility was highly restricted, current account deficits cause high capital flows, while after 1989 by increase in capital mobility current account balances are started to be caused by capital-financial account balances. Yan (2005) examines the same relationship among center - periphery countries and finds that among periphery countries causality runs from capital-financial account to current account while for center countries inverse is valid. Yan (2007) extends his previous analysis and searches for causal relation between subaccounts of financial account and current account balances and finds that among periphery countries, subaccounts of financial account have diverse causal relationship with current account deficits.

This work investigates causal relationship: i.) between current and capital-financial account, ii.) between current account and subaccounts of financial accounts, iii.)
between subaccounts of current account and financial account during the period between the last quarter of 1992 and the last quarter of 2009, and data are gathered from Balance of Payments data of Turkey which are issued by the Central Bank of the Republic of Turkey.

Causality Test Between Current and Capital Financial Accounts of Turkey

\[
CA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} KFA_{t-i} + e_{1t}
\]

\[
KFA = \beta_3 + \sum_{i=1}^{L} \beta_{4i} KFA_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + e_{2t}
\]

(1)

The first set of equations illustrates the possible causal relations between current (CA) and capital-financial account balances (KFA). According to Granger Causality Test procedure two hypotheses are tested. The first hypothesis states that “CA does not Granger Cause of KFA” (\(\beta_{2i} = 0\)) and second is “KFA does not Granger Cause of CA” (\(\beta_{5i} = 0\)). Tests are based on “restricted” versus “unrestricted” models. If CA’s (KFA’s) past values have greater explanatory power over KFA’s (CA’s) past values, it can be said that CA (KFA) does not Granger Cause of KFA (CA). (Watson and Teelucksingh, 2002)

In order to specify optimal joint lag order, VAR Lag Exclusion Wald Tests will be applied and Granger Causality between two series will be tested at the optimal lag. Table 7 illustrates Phillips-Perron Unit Root Test results.

As illustrated CA and KFA variables do not have unit roots and series are stationary. Table 8 summarizes the results of VAR Lag Exclusion Wald Test results.
Table 7: Phillips-Perron Unit Root Test Results of CA and KFA Series. * , ** and *** Represents the Rejection of Null Hypothesis (has unit roots) at 1 %, 5% and 10%, Respectively

<table>
<thead>
<tr>
<th>Phillips-Perron Unit Root Tests (1992Q1-2009Q4)</th>
<th>Drift</th>
<th>Trend and Drift</th>
<th>None</th>
</tr>
</thead>
<tbody>
<tr>
<td>CA</td>
<td>-3.16**</td>
<td>-3.92**</td>
<td>-2.74*</td>
</tr>
<tr>
<td>KFA</td>
<td>-3.89*</td>
<td>-4.68*</td>
<td>-3.13*</td>
</tr>
</tbody>
</table>

VAR Lag Exclusion Wald Test helps to find optimal lag levels. Optimal lags are those which have higher p-values than 1 % significance level.

According to Table 9, p-values of lags one and four are higher than 1 % significance level. Granger causality between CA and KFA series are tested at lag orders one and four.

According to Granger Causality test results, at lag order one unidirectional relation is found between KFA and CA series at 1 % significance level but despite that fact, the second hypothesis has lower p-value than the first one which states that the significance of the second hypothesis is greater than the first one. However, at lag order

Table 8: VAR Lag Exclusion Wald Test Results of CA and KFA Series of Turkey Between 1992Q1 and 2009Q4. (* = optimal lag level)

<table>
<thead>
<tr>
<th>CA</th>
<th>KFA</th>
<th>Joint</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lag 2</td>
<td>1.418161 [0.492096]</td>
<td>4.229954 [0.120636]</td>
</tr>
<tr>
<td>Lag 3</td>
<td>2.056236 [0.357680]</td>
<td>1.034132 [0.596267]</td>
</tr>
<tr>
<td>Lag 4</td>
<td>32.29338 [9.72e-08]</td>
<td>0.238730 [0.887484]</td>
</tr>
<tr>
<td>Lag 5</td>
<td>8.634286 [0.013338]</td>
<td>0.364116 [0.833553]</td>
</tr>
</tbody>
</table>
According to the results of Granger Causality test results, current account balances of Turkey are mainly driven by capital-financial account. However, that result is not sufficient to prove whether current account balances are driven by speculation-led growth. In order to capture speculative-led growth pattern of Turkey, causal relations of KFA’s (CA’s) subaccounts with CA (KFA) must be investigated.

Causality Tests Between Subaccounts of Capital-Financial Account and Current Account Balance of Turkey

Capital flows, which are constituents of capital financial account, are composed of three types of investments, which are foreign direct investments (FDI), portfolio investments (PI) and other investments (OI). Equations (2), (3) and (4) illustrate possible causal relationships between various types of capital flows and current account balances.

\[
CA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} FDI_{t-i} + e_{1t}
\]

\[
FDI = \beta_3 + \sum_{i=1}^{L} \beta_{3i} FDI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + e_{2t} \tag{2}
\]
\[ CA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} PI_{t-i} + e_{1t} \]

\[ PI = \beta_3 + \sum_{i=1}^{L} \beta_{4i} PI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + e_{2t} \]

\[ CA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} CA_{t-i} + \sum_{i=1}^{L} \beta_{2i} OI_{t-i} + e_{1t} \]

\[ OI = \beta_3 + \sum_{i=1}^{L} \beta_{4i} OI_{t-i} + \sum_{i=1}^{L} \beta_{5i} CA_{t-i} + e_{2t} \]

In order to test Granger Causality between aforementioned series, the same three-step procedure will be applied at preceding parts. Table 10 illustrates Phillips-Perron Unit Root Test.

As disclosed in Table 10 FDI, OI and PI series do not have any unit roots at least 5% significance level. Table 11 discloses the optimal joint lags that are chosen by VAR Lag Exclusion Wald Tests.

Causality tests are applied to optimal lag orders illustrated in Table 11. Table 12, 13 and 14 show the results of Granger Causality Test between i.) FDI and CA ii.) PI and CA ii) OI and CA.

Table 10: Phillips-Perron Unit Root Test Results of FDI, OI and PI series. *, ** and *** Represents the Rejection of Null Hypothesis (series have unit roots) at 1%, 5% and 10%, Respectively

<table>
<thead>
<tr>
<th>Phillips-Perron Unit Root Tests</th>
<th>FDI</th>
<th>OI</th>
<th>PI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drift</td>
<td>-3.481382*</td>
<td>-4.9061*</td>
<td>-6.048084*</td>
</tr>
<tr>
<td>Trend And Drift</td>
<td>-5.162528*</td>
<td>-5.450054*</td>
<td>-6.009096*</td>
</tr>
<tr>
<td>None</td>
<td>-2.64181**</td>
<td>-4.193583*</td>
<td>-5.974263*</td>
</tr>
</tbody>
</table>
Table 11: VAR Lag Exclusion Wald Test Results of FDI, PI and OI Series of Turkey Between 1992Q1 and 2009Q4. (* = optimal lag level)

<table>
<thead>
<tr>
<th>Lag</th>
<th>FDI-CA(Joint)</th>
<th>PI-CA(Joint)</th>
<th>OI-CA(Joint )</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>FDI-CA(Joint)</td>
<td>PI-CA(Joint)</td>
<td>OI-CA(Joint )</td>
</tr>
<tr>
<td>Lag 2</td>
<td>23.60463* [ 9.59e-05]</td>
<td>7.270705 [ 0.122256]</td>
<td>4.045900 [ 0.399830]</td>
</tr>
<tr>
<td>Lag 3</td>
<td>20.18070* [ 0.000460]</td>
<td>8.919928 [ 0.063132]</td>
<td>3.797086 [ 0.434163]</td>
</tr>
<tr>
<td>Lag 5</td>
<td>44.07854* [ 6.18e-09]</td>
<td>20.59743* [ 0.000380]</td>
<td>25.04786* [ 4.92e-05]</td>
</tr>
</tbody>
</table>

Table 12 summarizes the Granger Causality Test results of CA and FDI series of Turkey. Results show that there is no unique causal relation between CA and FDI series differently from causal relation relationship between KFA and CA series. There is a unidirectional relation between those series in lag orders one and 5 at 5 % significance level, while those series are independent at lag orders three-four and a causal relation from CA to FDI is found in lag order two at 5 % significance level. According to Table 13, PI series are found Granger Cause of CA series in lag order 1, 4, 5 at 10 % significance level. Finally, as illustrated in Table 14, OI and CA series are independent from each other.

FDI and OI series’ test results are in contradiction with predictions asserted in preceding chapters. There is no unidirectional causality between FDI and CA. There is no unique causal relationship with each other. Additionally, there is a feedback relationship between CA and OI inversely as it is asserted. A significant causal relationship from portfolio investments to current account balances is consistent with
Table 12: Granger Causality Test Results of CA and FDI Series of Turkey (1992Q1-2009Q4)

<table>
<thead>
<tr>
<th>Granger Causality Tests</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI does not Granger Cause CA</td>
<td>F=4.04245, p=0.0483</td>
<td>F=2.79568, p=0.0684</td>
<td>F=1.99492, p=0.1240</td>
<td>F=0.25843, p=0.9034</td>
<td>F=2.96875, p=0.0190</td>
</tr>
<tr>
<td>CA does not Granger Cause FDI</td>
<td>F=11.0104, p=0.0015</td>
<td>F=3.30541, p=0.0429</td>
<td>F=1.52805, p=0.2161</td>
<td>F=1.63962, p=0.1763</td>
<td>F=2.78529, p=0.0257</td>
</tr>
</tbody>
</table>

Table 13: Granger Causality Test Results of CA and PI Series of Turkey Between the Period 1992Q1-2009Q4

<table>
<thead>
<tr>
<th>Granger Causality Tests</th>
<th>Lag 1</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI does not Granger Cause CA</td>
<td>F=3.13349, p=0.0812</td>
<td>F=4.49501, p=0.0031</td>
<td>F=2.67692, p=0.0307</td>
</tr>
<tr>
<td>CA does not Granger Cause PI</td>
<td>F=1.0E-08, p=0.9999</td>
<td>F=0.77647, p=0.5449</td>
<td>F=0.64147, p=0.6690</td>
</tr>
</tbody>
</table>

Table 14: Granger Causality Test Results of CA and OI Series of Turkey Between the Period 1992Q1-2009Q4

<table>
<thead>
<tr>
<th>Granger Causality Tests</th>
<th>Lag 1</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>OI does not Granger Cause CA</td>
<td>F=8.81750, p=0.0041</td>
<td>F=5.35067, p=0.0010</td>
<td>F=3.39522, p=0.0095</td>
</tr>
<tr>
<td>CA does not Granger Cause OI</td>
<td>F=12.0860, p=0.0009</td>
<td>F=7.27582, p=8.0E-05</td>
<td>F=7.18447, p=3.0E-05</td>
</tr>
</tbody>
</table>
predictions and also with speculative led growth theory.

Causality Tests Between Subaccounts of Current Account and Capital-Financial Balance of Turkey

Causal relationship between subaccounts of current account balance and capital-financial account is also quite important. As asserted previously current account balance is composed of three major accounts which are goods and services balance (GS), income balance (INC) and finally current transfers balance (CT). According to speculative-led growth theory, surge in capital inflows induces risky investments and those investments deteriorate the current account balances through increasing trade deficits. If causality from KFA to CA is derived from trade deficits, it can be said that high current account deficits of Turkey are the results of speculative growth pattern after financial liberalization. The same three-step procedure will be applied in order to test causal relationship between subaccounts of current account balance and capital-financial account.

\[ KFA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} KFA_{t-i} + \sum_{i=1}^{L} \beta_{2i} GS_{t-i} + e_{1t} \]

\[ GS = \beta_3 + \sum_{i=1}^{L} \beta_{4i} GS_{t-i} + \sum_{i=1}^{L} \beta_{5i} KFA_{t-i} + e_{2t} \] (4)

\[ KFA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} KFA_{t-i} + \sum_{i=1}^{L} \beta_{2i} INC_{t-i} + e_{1t} \]

\[ INC = \beta_3 + \sum_{i=1}^{L} \beta_{4i} INC_{t-i} + \sum_{i=1}^{L} \beta_{5i} KFA_{t-i} + e_{2t} \] (5)

\[ KFA = \beta_0 + \sum_{i=1}^{L} \beta_{1i} KFA_{t-i} + \sum_{i=1}^{L} \beta_{2i} CT_{t-i} + e_{1t} \]

\[ CT = \beta_3 + \sum_{i=1}^{L} \beta_{4i} CT_{t-i} + \sum_{i=1}^{L} \beta_{5i} KFA_{t-i} + e_{2t} \] (6)
Table 15 discloses unit root test results of GS, INC and CT series of Turkey between 1992 and 2009. According to Table 15, GS, INC and CT series have unit roots. In order to eliminate unit roots, first difference of the series is taken. Table 16 illustrates unit root test results of first differences of GS, INC and CT series.

According to Table 16, first differences of the GS, INC and CT series do not have unit roots. Due to the unit roots problem, causality tests are applied to first differences of KFA, GS, INC and CT.

Table 17 illustrates Lag Exclusion Wald Test results. Granger Causality Tests are applied to GS(1) and KFA(1) series at lag orders one, two, three, four and five, to INC(1) and KFA(1) at lag orders one and two, to CT(1) and KFA(1) series at lag orders one, two and three. Tables 18, 19 and 20 illustrate the results of Granger Causality Test results between relevant series and KFA (1) at optimal joint lag levels.

According to the results of Granger Causality Test results, during the financial liberalization era, goods and services account is mainly induced by capital-financial account at lag orders one, two, three and four, while at lag five there is a feedback relation between those series at 5% significance level. However at lag order five, the first hypothesis still has lower p-value than the second hypothesis. Those results are found consistent with predictions asserted previously.

Table 15: Phillips-Perron Unit Root Test Results of GS, INC and CT Series. *, ** and *** Represents 1%, 5% and 10% Significance Levels, Respectively.

<table>
<thead>
<tr>
<th>Phillips-Perron Unit Root Tests</th>
<th>GS</th>
<th>INC</th>
<th>CT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drift</td>
<td>-3.25100*</td>
<td>-2.23893***</td>
<td>-2.22844***</td>
</tr>
<tr>
<td>Trend And Drift</td>
<td>-3.81693*</td>
<td>-5.63538</td>
<td>-2.97041***</td>
</tr>
<tr>
<td>None</td>
<td>-2.73994</td>
<td>-0.42204***</td>
<td>0.14780***</td>
</tr>
</tbody>
</table>
Table 16: Phillips-Perron Unit Root Test Results of GS (1), INC (1) and CT (1) Series. *, ** and *** Represents the Rejection of Null Hypothesis (series have unit roots) at 1%, 5% and 10%, Respectively

<table>
<thead>
<tr>
<th>Phillips-Perron Unit Root Tests</th>
<th>GS(1)</th>
<th>INC(1)</th>
<th>CT(1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drift</td>
<td>-24,32260*</td>
<td>-23,72501*</td>
<td>-12,48727*</td>
</tr>
<tr>
<td>Trend and Drift</td>
<td>-23,65957*</td>
<td>-23,68536*</td>
<td>-12,33800*</td>
</tr>
<tr>
<td>None</td>
<td>-15,43163*</td>
<td>-15,43163*</td>
<td>-12,58600*</td>
</tr>
</tbody>
</table>

Table 17: VAR Lag Exclusion Wald Test Results of GS (1), PI (1) and OI (1) Series of Turkey Between 1992Q1 and 2009Q4. (* = optimal lag level)

<table>
<thead>
<tr>
<th>Lag</th>
<th>GS(1)-KFA(1) (Joint)</th>
<th>INC(1)-KFA(1) (Joint)</th>
<th>CT(1)-KFA(1)(Joint)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lag 1</td>
<td>79.65867*</td>
<td>23.18616*</td>
<td>44.54297*</td>
</tr>
<tr>
<td></td>
<td>[ 2.22e-16]</td>
<td>[ 0.000116]</td>
<td>[ 4.95e-09]</td>
</tr>
<tr>
<td>Lag 2</td>
<td>57.82536*</td>
<td>15.75264*</td>
<td>20.86442*</td>
</tr>
<tr>
<td></td>
<td>[ 8.30e-12]</td>
<td>[ 0.003370]</td>
<td>[ 0.000337]</td>
</tr>
<tr>
<td>Lag 3</td>
<td>39.48918*</td>
<td>4.76092</td>
<td>18.99989*</td>
</tr>
<tr>
<td></td>
<td>[ 5.52e-08]</td>
<td>[ 0.312811]</td>
<td>[ 0.000786]</td>
</tr>
<tr>
<td>Lag 4</td>
<td>55.21165*</td>
<td>4.906814</td>
<td>5.099407</td>
</tr>
<tr>
<td></td>
<td>[ 2.93e-11]</td>
<td>[ 0.296993]</td>
<td>[ 0.277249]</td>
</tr>
<tr>
<td>Lag 5</td>
<td>19.49817*</td>
<td>3.478479</td>
<td>8.258452</td>
</tr>
<tr>
<td></td>
<td>[ 0.000627]</td>
<td>[ 0.481158]</td>
<td>[ 0.082557]</td>
</tr>
</tbody>
</table>

Table 18: Granger Causality Test Results of GS (1) and KFA (1) Series of Turkey Between the Period 1992Q1-2009Q4

<table>
<thead>
<tr>
<th>Granger Causality Test Results</th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
<th>Lag 4</th>
<th>Lag 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS(1) does not Granger Cause KFA(1)</td>
<td>F= 2.79603, p=0.0992</td>
<td>F= 4.91338, p=0.0103</td>
<td>F= 2.74419, p=0.0507</td>
<td>F= 2.04191, p=0.1004</td>
<td>F= 2.69008, p=0.0303</td>
</tr>
<tr>
<td>KFA(1) does not Granger Cause GS(1)</td>
<td>F= 13.0080, p=0.0006</td>
<td>F= 6.87650, p=0.0020</td>
<td>F= 4.65362, p=0.0054</td>
<td>F= 3.83463, p=0.0078</td>
<td>F= 2.55757, p=0.0376</td>
</tr>
</tbody>
</table>
Table 19: Granger Causality Test Results of INC (1) and KFA (1) Series of Turkey Between the Period 1992Q1-2009Q4

<table>
<thead>
<tr>
<th></th>
<th>Lag 1</th>
<th>Lag 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INC(1) does not Granger Cause KFA(1)</strong></td>
<td>$F=2.68037$, $p=0.1063$</td>
<td>$F=0.77256$, $p=0.4661$</td>
</tr>
<tr>
<td><strong>KFA(1) does not Granger Cause INC(1)</strong></td>
<td>$F=3.14561$, $p=0.0807$</td>
<td>$F=1.68812$, $p=0.1930$</td>
</tr>
</tbody>
</table>

Table 20: Granger Causality Test Results of CT (1) and KFA (1) Series of Turkey Between the Period 1992Q1-2009Q4

<table>
<thead>
<tr>
<th></th>
<th>Lag 1</th>
<th>Lag 2</th>
<th>Lag 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CT(1) does not Granger Cause KFA(1)</strong></td>
<td>$F=0.43038$, $p=0.5140$</td>
<td>$F=0.56897$, $p=0.5689$</td>
<td>$F=0.23741$, $p=0.8699$</td>
</tr>
<tr>
<td><strong>KFA(1) does not Granger Cause CT(1)</strong></td>
<td>$F=0.19833$, $p=0.6575$</td>
<td>$F=1.88045$, $p=0.1609$</td>
<td>$F=1.37681$, $p=0.2584$</td>
</tr>
</tbody>
</table>

KFA(1) and INC(1) series are found independent series from each other at lag orders 1 and 2, at 10% significance level. Lastly, it is found that CT(1) and KFA(1) series are independent from each other at lag orders 1, 2 and 3, at 10% significance level. Independent relation between KFA(1) and INC(1) series is in contradiction with prediction made previously. Those results show that direct causality from capital-financial account to current account arises from direct causality from capital-financial account to goods and services account.
CHAPTER VII

CONCLUSION

In this study, effectiveness of Turkey’s current account sustainability indicators that are based on theoretical dichotomy are investigated by applying Granger Causality Tests to current account and capital financial account balances during the postfinancial liberalization era of Turkey.

There are two main theoretical conceptions of current account imbalances and they can be grouped as “current account oriented views” and “capital account oriented views.” According to current account oriented views, higher current account deficit levels constitute structural problems of an economy, unless those balances are derived due to high increasing investment rates. As regards capital account oriented views, current account deficits are just a reflection of capital-financial account surplus. According to capital account oriented views, surge in capital inflows leads exchange rate appreciation and thus deteriorates trade balances through increasing import dependency of speculative-led growth. Current account sustainability can be achieved by regulations imposed on capital flows.

From that theoretical dichotomy about current account sustainability, several current account sustainability indicators are established, which are called in that work “current account oriented indicators” and “capital account oriented indicators.” Effectiveness of those indicators is investigated through testing causal relationship
between current account and capital-financial account, between subaccounts of capital-
financial account and current account balances, between subaccounts of current account
and capital-financial account. According to the results of Granger-Causality Test results,
current account deficits of Turkey are mainly induced by portfolio investments and that
causality arises from strong causal relationship from capital-financial account to goods
and services account. Those results indicate that in Turkey, during the period after
international financial liberalization, “capital-account oriented indicators” are more
effective in informing about current account sustainability than “current-account oriented
indicators.” And finally, current account sustainability in Turkey can be achieved
through imposing regulations on capital flows.

There are two main deficiencies of that work. The first one is lack of comparative
analysis between the prefinancial liberalization and postfinancial liberalization period due
to lack of Turkey’s balance of payments data for preliberalization period. Comparative
analysis can show that whether the same causal relationship between current and capital-
financial account is valid for prefinancial liberalization era. Secondly, in the Turkish
case, the causal relationship between foreign direct investments and current account
balance, between other investments and current account balance contradicts the
predictions made. Those different causal relationships must be investigated.

Finally, in that work it is found that current account deficits are mainly induced
by capital flows through speculative-led growth and current account deficits are
unsustainable due to the unstable nature of capital flows. On that account, in order to
achieve current account sustainability, Turkish authorities should impose regulations on
capital flows.
REFERENCES


