MARMARA ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI
İKTİSAT (İNGİLİZCE) BİLİM DALI

IS CURRENT ACCOUNT DEFICIT SUSTAINABLE IN TURKEY? A MACROECONOMETRIC APPROACH

Phd. Thesis

FAZIL KAYIKÇI

İstanbul, 2011

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Danışman: Prof. Dr. AYSU İNSEL

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Marmara Üniversitesi
Sosyal Bilimler Enstitüsü Müdürlüğü

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ÖZET

TÜRKİYE'DE CARİ İŞLEMLER DENGESİ AÇIĞI SÜRDÜRÜLEBİLİR Mİ? MAKRO EKONOMETRİK BİR YAKLAŞIM

Son yıllarda gelişmekte olan ülkelerin birçoğunun cari işlemler dengesinde sürekli ve büyük miktarlarda açıkları görüldü. Bu ülkelerin yaşadıkları para krizleri çoklukla kalıcı ve büyük cari işlemler dengesi açıklarıyla ilişkilendirilince de açıkların sürdürülebilirliği önem kazandı. Buradan yola çıkarak bu tezde, Türkiye'nin ödemeler dengesi serüveninden kısaca bahsettikten sonra, Latin Amerika ve Güney Doğu Asya ülkeleri ile karşılaştırmalar ve teorik tartışmaların ışığında Türkiye'nin yaşadığı cari işlemler dengesi açıklarının makroekonomik nedenleri Vektör Oto Regresyon ve Gecikmesi Dağıtılmış Oto Regresyon Modelleri ile belirlenmeye çalışıldı. Ardından bu açıkların sürdürülebilirliği, ödeyebilirlik ve aşırılık kriterlerine göre farklı ampirik metotlarla analiz edildi. İhracat ile ithalatın, ayrıca ulusal nakit akışıyla harcamaların arasında uzun dönemli ilişki olup olmadığı araştırıldı. Sonrasında ise, sürdürülebilir ve sürdürülemez periyotları belirleyebilmek için Markov rejim değişimi modeli kullanıldı. Cari işlemler dengesinin sürdürülebilirliği ile ilgili öngörüler elde etmek için temel makroekonomik değişkenlerin etkileri, açıkların kompozisyonu ve finanse edilme şekilleri teorik çerçevede tartışıldı. Başlıca iki nedenle cari açıkların kaynağıyla ilgili sorunun yapısal olduğu sonucuna varıldı. Birincisi, açıkların kısa vadeli aşırı tüketimden çok yatırımlardaki artıştan kaynaklanmasıydı. İkincisi ise, üretim ve ihracatın ara malı ithalatına dayanması sonucu ortaya çıkan dış ticaret açıklarından kaynaklanması oldu. Ayrıca, son yıllarda cari açıkların finansmanında doğrudan yabancı yatırımlardan çok borçlanmayla yapılması gibi negatif gelişmeler olduğu görüldü. Sonuç olarak, Türkiye'nin önümüzdeki birkaç yılda da cari işlemler dengesinde açık vermeye devam edeceği ve bu açıkların sürdürülebilirliğinin gittikçe daha zor hale geleceği öngörüldü.

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ABSTRACT

**IS CURRENT ACCOUNT DEFICIT SUSTAINABLE IN TURKEY?
A MACROECONOMETRIC APPROACH**

Many developing countries have experienced substantial and persistent current account deficits in recent years; this has raised the issue of sustainability since currency crises were often associated with large and persistent current account deficits. With this motivation, after presenting a brief history about balance of payments in Turkey, macroeconomic determinants of the current account deficits in Turkey were investigated by Vector Auto Regression and Auto Regressive Distributed Lag models in lights of the theoretical arguments made about Turkish Economy through making comparisons with Latin American and East Asian countries. Then, sustainability of the current account deficit was analyzed by different empirical techniques associated with solvency and excessiveness concepts. Both the long run relationship between exports and imports together with national cash flow and consumption were analyzed. In order to distinguish between sustainable and unsustainable periods for current account deficits, Markov regime switching model was used thereafter. Finally, sustainability of the current account deficits in Turkey was evaluated according to the macroeconomic fundamentals together with discussing the composition of current account deficit and the way of financing to have insights about the future path of current account balance. Problem about current account deficits were considered as structural for two reasons. First, the deficits were mainly caused by high rate of investments rather than temporary over-consumption decisions. Second, they were caused by foreign trade deficits largely as an outcome of dependence of production and exports on imported intermediate goods. Furthermore, there were negative developments about the way of financing in last years that share of debt instruments in financing has increased against FDI. As a result, it has seen that Turkey would continue to have current account deficits in the next years and sustainability of these deficits has become increasingly difficult.

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İstanbul, 2011 Fazıl KAYIKÇI

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ABBREVIATOINS

ADF	Augmented Dickey-Fuller
AIC	Akaike Information Criterion
ARCH	Auto Regressive Conditional Heteroskedasticity
ARDL	Auto Regressive Distributed Lag
ASEAN	Association of South East Asian Nations
BRSA	Banking Regulation and Supervision Agency
CBRT	Central Bank Republic of Turkey
CIS	Commonwealth of Independent States
DF GLS	Dickey-Fuller Generalized Least Square
ECLAC	Economic Commission for Latin America and the Caribbean
Eq.	Equation
ERM	European exchange rate mechanism
et al	And others
EU	European Union
FDI	Foreign Direct Investment
FPE	Final Prediction Error
FX	Foreign Exchange
G7	Group of Seven Countries
GDP	Gross Domestic Product
GNP	Gross Nation Product
HLM	Harberger-Laursen-Metzler
HQ	Hannan-Quinn Information Criterion
I(0)	Integrated of order zero
I(1)	Integrated of order one

IMF	International Money Fund
IS	Investment Saving
ISI	Import Substitution Industrialization
KPSS	Kwiatkowski-Phillips-Schmidt-Shin
LM	Liquidity Money
LM Test	Lagrange Multiplier Test
LR	Likelihood Ratio
MENA	Middle East and North Africa
NFA	Net Foreign Assets
Obs.	Observations
OECD	Organization of Economic Cooperation Countries
OLS	Ordinary Least Squares
PP	Phillips-Perron
SC	Schwartz Information Criterion
Std. Dev.	Standard Deviation
TB	Trade Balance
TL	Turkish Lira
TURKSTAT	Turkish Statistical Institute
UFT	Undersecreteriat of the Foreign Trade
US	United States
VAR	Vector Auto Regression
VEC	Vector Error Correction

1. INTRODUCTION

The current account balance of an economy is an important legend for its performance and has many significant roles in policymakers' analyses of economic growth and development. First, its importance stems from the reality that the current account balance is closely related to the level of the saving-investment ratio which is one of the key factors for economic growth. Second, a country's the current account balance reflects mainly the trade balance, which is the sum of domestic residents' transactions with all of the world in the markets for goods and services. Third, since the current account balance determines the evolution of a country's stock of net claims on the rest of the world, it represents the intertemp oral decisions of residents. Also, it has implications for imbalances between saving and investment, especially in terms of accumulation of foreign debt, which may not be sustainable. In this respect, growing debt stock of the country matters because it requires trade surpluses in the future to pay it back. Consequently, economists are trying to explain the change in the current account balances, estimate their sustainable levels and look to cause required changes in the balance through policy actions (Aristovnik, 2007, p.1).

As the liberalization of the economies after 1980s, differentiation of the exchange rate regimes in the countries, with the technological improvements in the financial markets and globalization of the world, international capital flows become more mobile and increase in the magnitude. This introduced new problems such as more severe and frequent crises in developing countries. These crises in developing countries have showed the need for a clear understanding of the factors underlying a country's current account position. Despite the relatively extensive body of theoretical literature on the subject, there are only a few comprehensive cross-country studies that empirically analyze the effect of macroeconomic variables on the current account deficit. This lack of cross-country empirical evidence is surprising given the fact that the position of the current account is typically used as one of the main leading indicators for future behavior of an economy and is part of the everyday decision process of policy makers. One of the objectives of this thesis is to examine the theoretical and empirical linkage between current account deficits and a broad set of economic variables. Current

account balance is associated with many components of the economy; hence, it has implications for economic growth, exchange rate and competitiveness as well as the capital flows and some other macroeconomic variables. Thus, not only the determinants of the current account deficits, but also the interrelationship between the current account and other macroeconomic components will be analyzed for the purpose of search for policy measures.

Several developing countries have experienced substantial and persistent current account deficits in recent years; this has raised the issue of sustainability and increased the volume of studies about the measures of sustainable current account deficits in the economic literature. Researches are especially concentrated on the issue that whether the deficits result with a balance of payments crisis or not. In this respect, some sustainability criteria were developed and these were used as indicators for the crises. Several studies have used the econometric techniques such as unit roots and cointegration analyses in order to evaluate the notion of sustainability. However, if we interpret the current account as a dynamic process in which it is determined by the outcome of the actions and expectations of forward-looking private agents, these empirical researches will not be sufficient for understanding the sustainability of the current account deficits. The issue should be analyzed both from empirical and theoretical perspectives. For example, the current account deficit may seem to be sustainable with the unit root tests but this can only be true for considering the ability to pay concept; it does not take into account the willingness of foreigners to continue to provide funds for the domestic country to sustain its deficits, furthermore, it does not make judgments about whether the continuing deficits would be desirable or which policies should be implemented to reduce the deficits without deteriorating the other macroeconomic conditions. Thus, the main objectives of this thesis are to provide both empirical criteria to sustain the current account deficit and policy implications by considering the interrelationship of the current account deficit with other economic variables such as the level of international competitiveness, the composition of external liabilities, the strength of the financial system, the degree of political stability, etc.

1.1. A BRIEF LITERATURE ON THE CURRENT ACCOUNT DYNAMICS

The pattern of current account imbalances has received considerable attention in the economics literature for many years. However, growth of current account deficits and financial crisis in the last decades has made the policymakers and economists to pay more attention and to work more frequently on the issue. The literature has especially focused on the determinants and the sustainability of the current account deficits from different points of views. Even though it can be partitioned into these two broad categories, the literature on the current account has much more variety both within these groups and in other relevant theoretical considerations.

Until recently, most empirical studies have mainly dealt with the response of the current account balance to the shocks in the one specific determinant. A broad part of the literature consists of from the studies that specifically choose a structural parameter and analyze its effects on the current account such as demography in Kim and Lee (2008), inflation in Mansoorian and Mohsin (2006), inflation stabilization in Calvo (2007), interest rates in Boileau and Normandin (2008), exchange rate adjustments in Obstfeld and Rogoff (2005), Devereux and Genberg (2007), exchange rate intervention in Mann (2004), terms of trade shocks in Matsuyama (1988), Kent and Cashin (2003), terms of trade shocks as Harberger-Laursen-Metzler effect in Obstfeld (1982), Bouakez and Kano (2008), economic integration in Blanchard and Gravazzi (2002), financial development in Chinn and Ito (2007), capital mobility in Adalet and Eichengreen (2005), Yan (2007), openness in Cavallo and Frenkel (2008), liberalization in Paulino (2002), uncertainty in Ghosh and Ostry (1997).

Despite the great amount of work about the specific candidates of determinants of current account it has been difficult to assess all of the factors jointly and compare their separate contributions. Thus, comprehensive empirical studies on the determinants of current account are quite scarce. An early attempt to provide comprehensive cross country study with a set of macroeconomic variables was performed by Debelle and Faruqee (1996). Following that, Clarida and Prendergast (1999), Calderon, Chong and

Loayza (2000), Chinn and Prasad (2000), Özmen (2005) have contributed to the literature by analyzing current account deficit for developing countries, Gruber and Kamin (2007) for Asian countries and Aristovnik (2007) for Middle East and North African countries.

One part of the literature considers the intertemporal approach to the current account according to which forward looking dynamic saving and investment decisions determine the current account deficits such as Obstfeld and Rogoff (1994) Ghosh and Ostry (1995), Matsubayashi (2005), Campa and Gavilan (2006), Oğuş and Sohrabji (2006). A related literature investigates the Feldstein-Horioka puzzle of persistent saving and investment correlation such as Kollias, Mylonidis and Paleologou (2006). Also, intertemporal approach has been used to evaluate the impact on the current account of fiscal policy in Leiderman and Razin (1991), the real exchange rate in Dornbusch and Fischer (1980), terms of trade fluctuations in Mansoorian (1998), capital controls in Mendoza (1991), and global productivity shocks in Glick and Rogoff (1995).

There are some examples in below table about the determinants of the current account deficit from the literature:

Table 1.1

Determinants of Current Account Deficits

	Glick, Rogoff (1995)	Milesi-Ferretti, Razin(1998)	Clarida, Prendergast (1999)	Calderon, et.al. (2000)	Chinn, Prasad (2000)	Özmen (2005)	Aristovnik (2007)	Gruber, Kamin (2007)
Growth		+	+	+	–			+
Relative Income					–		–	
Investment	+	+ / -					+	
Saving		–		–				
Government Spending							+	
Budget Deficit		+			+			+
Inflation				–		+	+ / -	
Financial Deepening					–	+ / -		
Demographic Profile					+			+
Political Instability		+						–
Openness					+	–	–	–
Real Exchange Rate		+	+	+		–		
Terms of Trade		–		–	–			
World Interest Rate		–		–			+	
Local Productivity Shock	+ / -							
Net Foreign Assets to GDP					–			+

Sustainability of current account deficit is one of the popular subjects among the researchers since most of the countries persistently had deficits for the last years. Thus, different methodologies and related empirical works have emerged to determine the sustainability of current account deficits. A common feature in existing literature is the finding of nonstationary current accounts using unit root tests such as Wu (2000) for Organization of Economic Cooperation Countries (OECD). Another approach is to examine the cointegration between exports and imports such as Husted (1992),

Leachman and Francis (2000) and Wu, Chenn and Lee (2001) for Group of Seven Countries (G7). There are also some studies that apply both methodology such as Baharumshah, Lau and Fountans (2003) and Ongan (2008). Furthermore, some researchers apply these methodologies by using intertemporal solvency approach such as Kalyoncu (2007), Matsubayashi (2005), Campa and Gavilan (2006), or by using Markov switching process such as Raybaudi, Sola and Spagnolo (2004). Some researchers try to find indicators for the sustainability without implying an empirical work such as Milesi-Ferretti and Razin (1996c), Oğuş and Sohrabji (2008b). Unsustainability of current account deficits which results with policy and regime shift or balance of payment crisis are also popular subjects in the literature as in Krugman (1979), Milesi-Ferretti and Razin (1998). There are some studies and their results about the sustainability of current accounts for different regions of the world in below table:

Table 1.2

Sustainability of Current Account Deficits

	Sample	Dates	Sustainable
Leachman, Francis (2000)	United States	1974 – 1994	No
Matsubayashi (2005)	United States	1975 – 1998	Yes
Lau, Baharumshah (2003)	Malaysia	1961 – 2001	No
Lau, Baharumshah (2001)	East Asia (4 Countries)	1961 – 1999	No
Wu, Chen and Lee (2001)	G7 Countries	1973 – 1998	Yes
Kalyoncu (2006)	OECD (22 Countries)	1960 – 2002	Yes
Wu (2000)	10 OECD Countries	1977 – 1997	Yes
Chortareas et. al. (2003)	Latin America (12 Countries)	1969 – 1999	Yes
Ongan (2008)	Turkey	1980 – 2005	No
Oğuş, Sohrabji (2008c)	Turkey	1991 - 2006	Yes
Adedeji, Handa (2008)	Nigeria	1960 - 2003	No
Holmes, Otero and Panagiotidis (2007)	European Union (EU) (13 old members)	1975 - 2005	Yes
Zanghieri (2007)	EU (10 new members)	1990 - 2003	Yes

2. THEORIES ON BALANCE OF PAYMENTS AND CURRENT ACCOUNT

2.1. BALANCE OF PAYMENTS ACCOUNT

The "Balance of Payments" can be formally defined as the statistical record of a country's international transactions, over a certain period of time in the form of a double entry book-keeping. An international transaction refers to the exchange of a good, service or asset between the residents of one country and the rest of the world. Because it is prepared in the form of a double entry book-keeping, any transaction that results in a receipt from foreigners will be recorded as a credit, with a positive sign; and any transaction that results in a payment to a foreigner will be recorded as a debit, with a negative sign. Credit entries increase the demand for the country's currency, whereas debit entries increase the supply of the country's currency in foreign exchange markets. Every credit in the account is balanced with a matching debit and vice versa. The main purpose of the balance of payments is to inform the government about the international position of the country and guide it for formulation of monetary, fiscal and trade policies. Another motivation for publishing the balance of payments account is a desire to maintain a record of the factors behind the supply of and demand for a country's currency. It follows that if we know the factors that influence the demand for and supply of currency, we also know what should be considered in a theory of exchange rates.

2.2. COMPONENTS OF BALANCE OF PAYMENTS ACCOUNT

Generally, a country's transactions with the rest of the world are presented in three main groups; current account, capital account and official reserve account. The current account includes export and import of goods and services, whereas capital account includes purchases and sales of stocks, bonds, bank accounts, real estate, and business. The official reserve account covers all purchases and sales of international reserve assets such as foreign exchanges, special drawing rights, gold and other precious metals. In the below figure, there is a detailed description of the components of the balance of payments:

1. Current Account
    1.1. Exports
        1.1.1. Merchandise Exports
        1.1.2. Investment Income Received
        1.1.3. Services
    1.2. Imports
        1.2.1. Merchandise Imports
        1.2.2. Investment Income Paid
        1.2.3. Services
    1.3. Net Unilateral Transfers

2. Capital Account
    2.1. Domestic Assets Held Abroad
    2.2. Foreign Assets Held in Domestic Country
    2.3. Statistical Discrepancy

3. Official Reserve Transactions
    3.1. Domestic Official Reserve Assets Held Abroad
        3.1.1. Gold
        3.1.2. Special Drawing Rights
        3.1.3. Reserve Position in the IMF
        3.1.4. Foreign Currencies
    3.2. Foreign Official Reserve Assets Held in Domestic Country
        3.2.1. Government Securities
        3.2.2. Liabilities of Domestic Banks

Figure 2.1: **Balance of Payments and its Components**

Source: International Economics: Theory and Policy. Krugman P. and Obstfeld M. (2000). Pages 316, 322.

When the balance of payments is recorded correctly, the combined balance of the current account, capital account and the reserves account must be zero. That is:

$$CA + KA + RA = 0 \qquad \text{(Equation 1)}$$

Where, CA is current account, KA is capital account and RA is reserve account. The above equation (Eq.) is the "Balance of Payments Identity" that must be necessarily hold. This identity indicates that a country can run a balance of payments surplus or deficit by changing official reserves that allow them to have balance of payments disequilibrium. Under a fixed exchange rate regime, the combined balance on the current and capital accounts will be equal in size but opposite in sign to the change in reserves. That is,

$$CA + KA = - RA \qquad \text{(Eq. 2)}$$

2.3. CURRENT ACCOUNT

Current account is a part of the balance of payments account that records the transactions of the residents with the rest of the world which includes the sales of goods and services to foreigners, purchase of goods and services from them, net investment incomes and transfers.

Exports and imports are divided into three categories; merchandise trade represents the export or import of the goods, services represents the items such as payments for legal assistance, tourists' expenditures, royalties for patents and intellectual properties, insurance premiums and shipping fees, investment income represents international interest and dividend payments and the earnings of domestically owned firms operating abroad. The balance of these is especially called trade balance. Unilateral transfers include payments such as foreign aid, reparations, official and private gifts and donations that do not correspond to the purchase of any goods or services. These items are called unilateral transfers because, unlike the case of other items in the balance of payments where the item being traded goes in one direction and payment goes in the other, in the case of gifts and aid there is a flow in only one

direction. For the purpose of double entry book-keeping, unilateral transfers are treated as if the donor buys goodwill from the recipient.

2.4 DIFFERENT APPROACHES TO CURRENT ACCOUNT

2.4.1 Elasticities Approach

This approach explains the determination of the exchange rate and the external balance adjustment under different foreign exchange rate regimes by using demand and supply schedules of foreign exchange rate with home and foreign demand-supply elasticities of exports and imports. Exchange rate serves as the price that clears the foreign exchange market. The change in exports and imports as a result of changes in relative prices is considered as current account adjustment.

Under flexible exchange rate system, the adjustment mechanism is automatic. Any deviation from the equilibrium exchange rate will end up with the establishment of the new equilibrium level by the demand and supply forces and resulting depreciation or appreciation of the currency. For a given devaluation to improve trade balance of the devaluating country, sum of the foreign export demand elasticity and home import demand elasticity must be greater than one (Marshall-Lerner Condition).

Under the gold standard, the adjustment of the external balance took place by movements of gold as a result of change in demand and supply for foreign exchange. In this system, all countries established a fixed parity for the exchange rate in terms of gold. Domestic money supply was determined by the direction of flows of gold, in response to a adjustments in terms of wages, prices and interest take place and consequently equilibrium was restored.

Under the pegged exchange rate systems, the determination of the exchange rate is similar to the gold standard system, the exchange rate is defended by the Central Bank reserves with the only difference that gold is not the crucial item that is being exported or imported as the balancing factor. (Yücel, 2006, p.52).

Price elasticity of export and import for Turkey has been estimated by Akal (2010) such that import is little more elastic (-0.43) than exports (-0.41). Furthermore,

in the same study, income elasticity of import (2.24) has been found much greater than the income elasticity of export (1.99). These calculations imply that as the economy grows, current account deficits are unavoidable which will be explained in the empirical part for the determinants of the current account in detail.

2.4.2 Keynesian Approach

Keynesian model of balance of payments was developed, in which the emphasis has shifted to change in output as the key to attain external balance and foreign trade multipliers in determining the change in exports and imports. Keynesian view of external balance (also known as income approach) associated the changes in national income with the fluctuations in external balance. The basic assumptions forming the Keynesian Approach were as follows: constant marginal propensity to save and import together with fixed exchange rate. Domestic investment is independent by changes in foreign trade. It started with a national income below full employment levels against the assumption of unchanging output in elasticities approach,. This allowed the expenditure switching effects of devaluation to increase the level of domestic output. With these assumptions, foreign trade multipliers are estimated, which show the extent the changes in exports and investment will induce a change in income.

Some propositions of this approach are as follows. First, the devaluation of domestic currency is expansionary in the sense that it raises domestic output and reduces foreign output. Following the devaluation of the domestic currency, the demand for domestic goods rises whereas the rise in the relative price of the foreign good reduces the demand for foreign good. Second, due to the impact of devaluation on output of both the domestic and the foreign countries, the improvement of the trade balance of the devaluating country will be less than the Marshall-Lerner condition would predict. This is known to be the transmission problem in the literature, which evaluates the impact of change in the national income of one country upon the balance of trade of another country. Third, a change in the exchange rate is an optimal policy response to a spontaneous switch in expenditure and a shift in foreign expenditure. For example, faced with an unexpected shift in domestic expenditures, which increases foreign country's income and yields a current account surplus in that country, the home

country should at best devalue its currency to restore both internal and international equilibrium again. Finally, devaluation will not improve a country's current account balance, which has started at full employment, if the demand for domestic goods cannot be reduced. If domestic output cannot be increased following the rise in demand for the domestic good after devaluation, the result will be a price increase in the home country offsetting the positive impact of the devaluation. This proposition, however, ignited another line of study in which the economists searched the way devaluation effects absorption, namely savings and investments. (Yücel, 2006, p.54)

However, this approach received considerable criticisms. First, it was argued that it can be applied only to the depression conditions of the interwar period. Its conclusions are claimed to be plausible only in the case that income could expand without leading to rise in prices. It was also criticized on the basis that it ignored the implications of the elasticities approach like the influence of exchange rate expectations, relationship between foreign and domestic interest rates and the problem of controlling the money supply. Arguments of the Keynesian approach do not apply for Turkey either. All of the devaluation periods after economic crises have end up with a current account improvement but there were not clear relationship between the devaluations and Industrial Production Index growth since 1987 which is opposed to the implications of the Keynesian Approach for domestic output expansion.

2.4.3 Monetary Approach

In the Monetary Approach, as opposed to the disregarding of monetary implications in the Keynesian Approach, money has been added to the model as one of the important determinants of balance of payments realizations. According to this approach, balance of payments were influenced mostly by monetary developments. Hence, any imbalances in the balance of payments would be solved not through adjustment in real variables but through the money markets. "For example, under fixed exchange rates, expansion in the money supply by the monetary authority would create excess supply of cash balances and the households try to exhaust this excess by demanding foreign goods, services and financial assets. In this way, the money supply would flow out the country, output movements restoring the equilibrium in the supply

of and demand for real balances. Under flexible exchange rates, however, the adjustment is rendered through autonomous change in the level of exchange rates. The domestic money expansion will simultaneously lead to a depreciation of the domestic currency." (Yücel, 2006, p.57).

The basic assumption in the monetary approach is that the foreign exchange flows may not be sterilized which can have direct consequences on the money supply. When full employment is obtained in the long run equilibrium, both prices and domestic interest rate levels are equalized at world levels, the result of the domestic credit expansion will result in a decline in reserves. When the issue comes to the comparison of these two views, Keynesian and Monetarist approaches differ in their analysis of where the loss in reserves comes from even though both of them end up with the result that the domestic credit expansion eventually leads to a decline in reserves. Monetary approach suggests that the decline in reserves corresponds to the excess money in the economy, while Keynesians argue that the corresponding changes in the real variables such as imports lead to a decline in reserves as the money supply slowly increase. According to the Keynesian approach, decrease in the interest rates that follows domestic credit expansion could encourage output, investment and employment, and hence demand for imports. Nevertheless, increase in domestic demand would be faster when compared with the increase in money supply, as the latter would be provoked rapidly with the perception of a rise in total incomes. Thus, aggregate demand would lead to decline in reserves, instead of increase in unwanted cash balances at any point in time in the economy. (Yücel, 2006, p.58).

Predictions of the monetary approach for the current account seem to fit the behavior of the current account balance and money supply dynamics of Turkey. Monetary approach argues that the domestic money expansion will lead to an inflation and depreciation of the domestic currency which ends up with current account improvement. Following the analysis of inflation and current account balance data for Turkey it can be seen that average inflation rate between 1987 and 2001 was 73% with an average current account deficit 0,6% whereas average inflation rate between 2002 and 2009 was 8,6% with an average current account deficit 5,6%. This data demonstrate

that there is a trade of between inflation and current account balance. Since the 2001 crisis, government and central bank have focused on decreasing inflation rate and adopted an appreciated Turkish Lira that has caused to worsen the current account deficit.

2.4.4 Mundell-Fleming Model

Adaptation of Keynes' General Theory on open economy and implementation of different variations of this theory by Metzler, Machlup and Meade provide a basis for this approach. According to Mundell (1963) and Fleming (1962), the primary objective of the governments was to maintain full employment and the governments were able to attain both external and internal balance through various policy means. This has very important policy implications according to different exchange rate regimes and capital mobility assumptions and in this setting, the balance of payments emerges as a problem or a constraint in order to achieve the domestic policy goal. Mundell-Fleming model is an application of the Investment Saving – Liquidity Money (IS-LM) model for the open economy framework. It has a three dimensions where the market for goods, foreign exchange and money are cleared to produce pairs of income and interest rates. The model argues that, if the monetary authority does not sterilize the depletion of reserves the effectiveness of expansionary fiscal policy increases with capital mobility under fixed exchange rate regime while expansionary monetary policy is not effective neither with capital controls nor with perfect capital mobility. (Yücel, 2006, p.59).

Predictions of the Mundell-Fleming model for the flexible exchange rate system are more or less similar to what has been seen in the last decade in Turkey; while export growth rate was falling behind import growth rate as a result of high interest-low exchange rate policy, high interest rates have attracted capital flows which lead to the appreciation of the exchange rate and current account deficits. At the same time, as being a part of exchange rate policy, as the prices were suppressed in domestic market by cheapening importation, fighting with inflation was supported and remarkable increase was seen in households' income. However, this increase in income is mostly offsetted by the current account deficits.

2.4.5 Competitiveness Approach

According to the competitiveness approach, the competitiveness of an economy as a whole results in a current account surplus whereas the low competitiveness is a cause for current account deficits. This approach is mainly based on two notions: First, the competitiveness of a whole economy can be interpreted as the ability of local enterprises to sell their goods in world markets. Therefore competitiveness is interpreted as the ability to sell. Second, a rise in the overall competitiveness leads directly to a surplus on current account because of local goods attracting a larger share of world demand. This suggests a quite robust relationship between competitiveness and the current account. In the literature, two different types of competitiveness are distinguished: price and non-price competitiveness. Price competitiveness depends on the price of the local goods and the exchange rate. Non-price competitiveness depends on the quality, service, timely delivery etc. Nevertheless, these two concepts are not independent of each other. As it is obvious, measuring the changes in non-price competitiveness is very difficult, therefore distinguishing price and non-price competitiveness is not an easy task. For example, an increase in the price of local goods or an appreciation of the exchange rate may be the result of an increase in the quality. For this reason, the interest of economists mainly focuses on overall competitiveness of the economy instead of trying to measure the changes in price and non-price competitiveness.

On the other hand, the relationship between competitiveness and the current account is vulnerable. First, the ability to sell concept is not a good indicator of competitiveness, not only for an economy, but also for a firm. A firm may lower its price in order to be able to sell its product. But as the microeconomic theory explains, a firm should set its price above the minimum value of the average variable cost; otherwise it could not be able to pay the prices of factors and the mobile factors of production (such as labor) will move to other firms or sectors. In short, the ability to sell is not a sufficient condition for survival. Second, the ability to sell approach indicates that the balance on current account is derived from bilateral or sectoral balances which

are simply added up. The assumption that the competitiveness of a nation is simply the aggregation of the competitiveness of single firms is not realistic. To add-up the competitiveness of local firms or sectors, the competitiveness of each firm or sector should be independent of the others. But if we assume that capital is internationally mobile whereas labor is not, we see that the international competitiveness for factors is restricted to the capital. On the national level, firms also compete for labor. So the competitiveness of a firm or sector is not only adversely affected when foreign firms offer better or cheaper products, but also when other local firms or sectors increase their competitiveness and offer higher wages. Since the adverse effects of a wage increase of local firms are restricted to the home country and the foreign competitors are not affected, their competitive position is improved. As a result, assuming that the competitiveness of one sector or firm reflects the competitiveness of the whole economy is not realistic. Yet, as the standard international economics theory indicates, a country always has a comparative advantage in some sectors, regardless of the productivity levels of the other countries.

When the arguments of this approach are considered for Turkey; after 1980s the incentives that had been applied to export, devaluations of TL, decreasing the production costs by suppressing the wages and reducing the internal demands, financial liberalization and institutionalization, obviously had been important factors for increasing the competitiveness of Turkey and export oriented growth of the economy. Increasing the weight of current account balance and balance of payments on the economy, and particularly on export by decreasing production costs have provided significant increase in exports comparing with previous periods. Exports had doubled, especially in the first half of 1980s with a continuous and high rate of increase and this increase had continued even though it had lost some of its acceleration thereafter. However, this price competitiveness obtained by suppressing the wages has come to an end in 1990s. Furthermore, China's penetration to the world markets for the last years has made more difficult for Turkey and similar countries to compete with prices. As the volume of international trade has been accelerating over the last decade and both the bilateral and regional trade agreements, the definition of the competitiveness had already change slightly from the price competitiveness to the non-price competitiveness.

As a response to these developments, the notion of compete with quality had been adopted and more priority had been given to the some key sectors in the development plans of Turkey.

2.4.6 Intertemporal Approach

The former models of the current account had fallen short of capturing new issues and problems related to the foreign exchange flows in the early 1980s and a need to develop another approach to the current account developments has emerged. With the extraordinary increase oil prices in the oil crisis of 1973-74 as unexpectedly, the current account deficits of almost all oil importing countries had risen substantially and increased lending to these developing countries for the deficits had opened the debate of intertemporality of the balance of payments decisions and the sustainability of the current account imbalances. These developments have caused a need for a new line of studies in the current account analysis. Thus, a dynamic analysis of balance of payments has been developed, which focused on forward looking agent's dynamic behaviors about saving and investment as the determinants of current account balance instead of static analysis attempting to investigate the event in the short run. This tradition of current account models which were inspired by Sachs (1982) labeled as the intertemporal model of current account. The starting point of the intertemporal approach was Lucas's critique of the econometric policy such that he suggested that open economy models might be more reliable if they depend on optimization problems of households rather than econometric specifications. According to Obstfeld and Rogoff's (1994) characterization of intertemporal models, the mechanism behind the current account fluctuations is the consumption smoothing. The representative consumer, who has a perfect foresight, maximizes an intertemporal utility function with respect to her time separable budget constraint. According to the budget constraint of the individual, the discounted value of her future consumptions must equal to the present values of income flows that includes stock of interest earning assets, real wage and the real value of securities of the firms. This dynamic process can be translated into equilibrium in a small open economy by aggregating all identical individuals. Like that, the economy has a budget constraint and therefore the present value of the economy's expenditures

must equal to the present value of its net foreign wealth and domestic production. (Yücel, 2006, p.60-62).

Intertemporal model is one of the useful tools especially for determining the sustainability of the current account by examining whether the intertemporal budget constraint is satisfied or not. Such that, in the empirical work of this thesis, this approach is going to be used to search for evidences about violation of the intertemporal balance of Turkey; decision for the sustainability of the current account deficits that emerged in the last decades in Turkey will be made according to the empirical results in which the country smoothes its consumption optimally or not.

2.5 BALANCE OF PAYMENTS IMBALANCES

In the 1990s, balance of payments became a very popular subject of research for economists because of the many balance of payments crises that occured in different regions of the world. Yücel (2006) argues that those took the form of currency crises accompanied by substantial capital outflows. In the late 1970s and early 1980s, there were few cases of currency crises especially in Latin America. Later, the European exchange rate mechanism (ERM) collapsed in 1992. Mexican peso crisis in 1994 and subsequent currency crises in the Latin America were followed by a wave of currency crises of Asia and Russia in 1997 and 1998. Finally we have seen the collapse of local currencies followed by free floating of the currencies in Turkey at the beginning and in Argentina at the end of 2001. “These series of crises in the last decade were so frequent that the existing models were inadequate in explaining them; hence, a significant collection of studies accumulated, giving way to different interpretations of the currency and balance of payments crises.” (Yücel, 2006, p.37)

In this respect, in the recent studies current account balance is considered to be an indicator, showing that the country is spending beyond its means (Calvo and Vegh, 1999). Various sustainability indicators have been proposed, by which an acceptable level of current account deficit that the country can bear without endangering its solvency position. The following sections briefly explore those different perspectives

that evolved on sustainability of the current account and balance of payments crises since 1980s.

2.5.1 Sustainability of Current Account

Different behavior of foreign exchange flows in the 1990s from the former periods was the expansion in the size of the flows throughout the world. Parallel to this development, persistent current account deficits were observed in some developing countries receiving substantial foreign capital. Furthermore, in contrast to the 1980s, when current account deficits were regarded as being closely related to the fiscal deficits, the private saving and investment decisions assumed to play a major role in the determination of capital flows in the 1990s. Likewise, the former periods were characterized by external borrowings whereas in the 1990s, portfolio and foreign direct investment occupied the bulk of the foreign exchange flows (Milesi-Ferretti and Razin, 1996a).

Three concepts have been proposed in the recent economic literature to evaluate whether persistent current account deficits pose serious problems. These are; solvency of foreign debt, sustainability of the current account deficit and the excessiveness of the current account deficit, which rest on the intertemporal allocation of resources and intertemporal feature of decisions of the economic agents. Solvency is defined as a state where a country's discounted value of the expected stock of its foreign debt in the infinitely distant future is non-positive (Corsetti, Presenti and Roubini, 1998). Sustainability is defined as a case where current economic policies can be maintained at the same time fulfilling the solvency condition, that is, by maintaining the ratio of external debt to Gross Domestic Product (GDP) at stable levels (Milesi-Ferretti and Razin, 1996a). Excessiveness can only be measured by relying on a model that specifies the behavior of consumption, investment, output and yields predictions about the equilibrium external imbalances. Actual imbalances can then be compared to the theoretically predicted ones in order to judge whether the imbalances have been excessive or not.

2.5.2 First Generation Models of Balance of Payments Crisis

According to first generation models, the monetary expansion stands at the core of the crisis by the government to finance its budget deficit while pursuing a fixed exchange rate regime. Most celebrated example of these models is the Krugman's model (1979). In that model, a country has a pegged currency and the government prints money and thus finances its budget deficit. The country looses its reserves slowly by doing this, which cannot be carrying on until the international reserves totally exhausted. At a point in time around some threshold level, a speculative attack to the international reserves occurs as the investors, who foresee that a jump in the foreign exchange would take place whenever reserves are exhausted, attempt to maintain their existing capital. (Yücel, 2006, p.43).

There are many theoretical contributions of the first generation models. First, they stress the importance of fundamentals as the causes of a crisis. Second, they define the case where crisis breakouts without the government having completely exhausted its reserves. Third, the models propose that for a central bank to be able to defend its parity, it should be well endowed with sufficient exchange reserves. Finally, it is implied that being able to defend a currency by the central bank is very hard in any case (Eichengreen, Rose and Wyplosz, 1997). In sum, the first generation balance of payments crisis models explain the crisis as the outcome of the inconsistency between the domestic economic policies and maintaining the fixed exchange rate regime.

2.5.3. Second Generation Models of Balance of Payments Crisis

Second generation models have emerged in response to the criticism directed to the first generation models. According to Yücel (2006), one of the major criticisms was that those were mechanical due to their assumption that a government only printed money to finance its deficits. In contrast, it is argued that the authorities were endowed with wide range of instruments other than selling foreign exchange to maintain the exchange rate, such as the short term interest rates and tight monetary policy (Krugman, 1999). Hence, this approach has offered a new explanation for the causes of balance of payments crisis by modeling multiple equilibria and self-fulfilling attacks. Obstfeld

developed this type of models in his paper (1994), where he constructed two models in which the government finally responses to market's expectations of devaluation.

"Second generation models bring into question the expectations and self-fulfilling elements in triggering the crisis. Even in a case of equilibrium in its balance of payments and its fiscal budget, a country may find itself obliged to leave the fixed exchange rate or devalue the domestic currency merely due to a speculative attack." (Yücel, 2006, p.45).These models show that speculative attack is ultimately generated and the fixed exchange rate regime collapses if the investors realize a tension between the intention of the government to abandon the peg and the obligation of preserving it and they believe that the current situation is not sustainable. According to Krugman (1999), three basic elements that together generate a crisis are the following. The first one is a reason to depreciate, the second is a reason to keep the fixed exchange rate regime and the third one is a reason for the expectation of devaluation to increase the cost of maintaining the level of exchange rate. As a result, this type of crisis is ultimately the outcome of the inconsistencies in the economic fundamentals.

Turkey has experienced a crisis in 2001 that can be more or less considered as this type. At the end of 1999, it embarked on an exchange rate based disinflation program backed by a three year stand by arrangement with the IMF (International Monetary Fund). A tight fiscal stance, structural reform and a firm exchange rate commitment were the main pillars of the program which also featured a quasi-currency board arrangement for the central bank. The program has established a framework for using the exchange rate as nominal anchor and supporting the exchange rate policy with various structural arrangements and with strict finance policy. The exchange-rate-based stabilization program followed a familiar path with a surge in capital inflows, an upturn in economic activity, a significant appreciation of the currency, mounting trade deficits, worsening balance sheets and rising exchange-rate risks. Due to seasonal or some external factors as well as delayed reforms and stabilizations, an outflow has started, liquidity in the system was reduced, overnight interest rates have increased which lead to sales of government securities by banks who were desperately seeking funds and are not able to obtain from the inter-bank market because their credit lines are cut due to

increase in vulnerability. Capital outflow has lead to a reduction in the international reserves causing an upward pressure on the exchange rate risk, prompting a speculative attack. The central bank had to abandon the exchange rate anchor.

Turkey is not the only country that has experienced failed stabilization attempts. In the last four decades, countries with the chronic inflation problem have undertaken repeated stabilization attempts and most of these attempts have resulted in balance of payments crises, loss of international reserves and costly devaluations. In the exchange rate based stabilization programs, appreciation of domestic currency and the increase in the demand for import was analyzed in a theoretical model by many economists. Calvo and Vegh (1999), in their model, define the behavior of the consumers who search for an optimal equilibrium in an intergenerational budget constraint environment. Ertuğrul and Yeldan (2003) also argue that, the programs that are based on an exchange rate anchor initially generate a demand-based expansion accompanied by rising and usually unsustainable trade and current account deficits followed by a contractionary phase, the magnitude of which depends on the size of the earlier external deficits. In their analysis of the Mexican crisis in 1994, Sachs, Tornel and Velasco (1996) suggest that, apart from the weak fundamentals like appreciated real exchange rate, weak banking system and devaluation expectations due to these weak fundamentals prior to the crisis; self-fulfilling speculative attack played the major role in activating the crisis. "As the possibility of a crisis was realized, the panic has spread to neighboring countries such as Argentina, Brazil and Philippines leading to self fulfilling crisis known in the literature as Tequila Effect" (Sachs et. al., 1996, p.149).

Even though there were no inflation and exchange rate stabilization program in effect for recent years in Turkey, this crisis and developments can be a good illustration about possible outcomes of pegged exchange rate policies in terms of current account balance.

2.5.4. Recent Studies on Balance of Payments Crisis

When the agressive devaluations in East Asia took place in 1997, none of the above models could explain the determinants of the crisis. The government's budget

deficits were not significantly large that would alert for a crisis. Also, choosing between maintaining the exchange rate and reducing unemployment by expansionary policies was not a necessary. Thus, explaining the currency crisis with the self fulfilling motive did not seem to sufficient. Therefore, the researchers turned on to banking sector to find the possible causes of balance of payments crisis. (Yücel, 2006, p.47).

Most of the approaches have placed the problems related to the banking sector at the core of the arguments. Particularly, the role of various problems in triggering currency crisis, such as over-borrowing and moral hazard lending of banks driven by the government's implicit guarantees or a self fulfilling loss of confidence that leads to early liquidation of investments were explored by the several studies (Corsetti et. al., 1998). In those studies, weaknesses in the banking system that are associated with the currency crisis were stated as follows: firstly, the excessive lending of the international institutions to banks without comprehensive risk evaluations deteriorated the quality of the bank loans, as the banks, endowed with large funds competed to extend credits, neglected and extensive evaluation of their customers. Secondly, the government's hidden or open guarantees become another source of disturbance in the banking system, by providing shelter for over risky projects undertaken by banks. Thirdly, the short term nature of the banks' borrowing from abroad was another factor, which added to the fragility of the banking sector.

Kaminsky and Reinhart (1998), in their analysis of the latest crisis in Asia introduce a term "twin crisis" referring the simultaneous crises in both banking sector and balance of payments, especially in 1980s and 1990s. The specificity of the time period indicates that the twin crisis are an otcome of financial liberalization. In their study, Kaminsky and Reinhart found that the two crises have common origins in weak economic fundamentals and external shocks and both are closely interrelated such that the crisis in one of the fields feeds the other. Despite this interrelationship, however, the they also argue that the balance of payments crisis does not start immediately due to the weaknesses in the banking sector, although banking crisis usually precedes the currency crisis., they claim that such problems in the banking sector aggravate the latter rather than being the source of balance of payments crisis. (Yücel, 2006, p.48).

High liquidity in the international markets and resulting excessive borrowing of banks have also created a crisis potential in Turkey. According to Bildirici, Alp and Kayıkçı (2011, p.1061), through the effect of high interest rate policy, banking sector has changed its borrowing policy. As the increase of interest rates makes public bonds attractive in terms of banks, in order to benefit from high interest inside the country, banks were borrowing through low interest from overseas and lending to the treasury by using these funds. Through the effect of foreign exchange coming from this way, while importation becomes cheaper exportation becomes more expensive, foreign trade deficit and hence the current account deficit was growing. Because banking sector and private sector raised short term foreign loans, which were called informally as locally originated hot money, when the government tended to apply to external borrowing instead of domestic borrowing, this policy acted as an intensifier of crisis at the ongoing process. Such that, open positions of banks increased to 3.782 million dollars in 1993, 2.070 million dollars in 1999 and 1.741 million dollars in 2000. Some regulations that are imposed to banks after 2001 crisis changed this process relatively. Although banks were partly hindered from using this channel after 2001 crisis through the banking reformations, it was not possible to extinguish totally. According to BRSA (Banking Regulation and Supervision Agency) 2009 report, banks' foreign currency position gap is 10 billion 511 million dollars in their balance sheets.

2.6. Current Account Developments in Selected Regions

Industrialized countries had current account surpluses in the last decades in general. In Japan, current account surplus was 2,36% of GDP, which has become increasingly large and reached to 3,29% in 2000s. The amount of its current account surplus was reduced to 142 billion dollars in 2009 after global crisis, which had reached to its highest level in 2007 by 210 billion dollars. In Russia, current account surplus was 3,19% of GDP, which has become increasingly large and reached to 9,27% in 2000s. The amount of its current account surplus was reduced to 49 billion dollars in 2009 after global crisis, which had reached to its highest level in 2008 by 103 billion dollars. In China, current account surplus was 1,70% of GDP, which has become increasingly large and reached to 5,45% in 2000s. The amount of its current account surplus was

reduced to 297 billion dollars in 2009 after global crisis, which had reached to its highest level in 2008 by 436 billion dollars. In Germany, current account deficit was 0,56% of GDP, which has become a surplus and reached to 3,70% in 2000s. The amount of its current account surplus was reduced to 165 billion dollars in 2009 after global crisis, which had reached to its highest level in 2007 by 254 billion dollars. For the last decades, United States has emerged as the only industrialized high income country that has run large current account deficits. In the 1990s, average current account deficit was 1,57% of GDP, which has become increasingly large and reached to 4,68% in 2000s. The amount of the US current account deficit was reduced to 378 billion dollars in 2009 after global crisis, which had reached to its highest level in 2006 by 802 billion dollars.

While the aggregate European Union current account was close to a balance with little bit surplus, it has started to be in a deficit after the global crisis. However, aggregate level hides the remarkably different evolution of the current account balances across member states. Some of the member states (especially the new members) had large current account deficits with a worsening trend. In Greece, average current account deficit was 2,50% of GDP in1990s, which has become increasingly large and reached to 9,25% in 2000s. Its current account deficit was reduced to 36 billion dollars in 2009 after global crisis, which had reached to its highest level in 2008 by 51 billion dollars. In Portugal, average current account deficit was 2,81% of GDP in1990s, which has become increasingly large and reached to 9,81% in 2000s. Its current account deficit was reduced to 24 billion dollars in 2009 after global crisis, which had reached to its highest level in 2008 by 32 billion dollars. In Spain, average current account deficit was 1,79% of GDP in1990s, which has become increasingly large and reached to 6,16% in 2000s. Its current account deficit was reduced to 80 billion dollars in 2009 after global crisis, which had reached to its highest level in 2008 by 156 billion dollars. Ireland, United Kingdom and Italy were other countries which had large current account deficits in 2000s with averages of 2,40% 2,18% 1,68% of GDP respectively. The situation was even worse for the 12 new member states that unweighted average deficit in their current accounts was 6,55 % of their GDP's in 2000s. Finland, Netherlands, Sweden

and Germany were the countries which have helped the current account for balancing in aggregate level in Euro area.

Oil exporting countries had the highest current account surpluses in the last decades as expected. Their current account surplus was average of 14,6% of their GDP unweightedly in the 1970s as a result of peaks in oil prices. Those surpluses has decreased in the 1980s and even turned into deficits for some of them in the 1990s. However, unweighted average of the current account surplus was increased to 18,52% in 2000s. For example, Saudi Arabia had 132 billion dollars current account surplus in 2008.

MENA countries, as a contrary to their oil exporting neighbors, had mostly deficits in their current account balances. Especially Tunisia, Jordan and Lebanon were the countries which had increasingly high current account deficits in 2000s as compared to their near balanced levels in 1990s. However, Egypt, Israel and Morocco were the countries that had balanced current accounts for the last two decades.

Current account imbalances for ASEAN (Association of South East Asian Nations) in 1990s were interestingly similar with Turkey from some aspects. They had deficits when their economies and imports were growing fast and they were attracting foreign capital flows. Their budget deficits were not much enough to create current account imbalances but private sector's investment and saving decisions were the main causes of the current account deficits. All of them had a history of several episodes of current account imbalances that coincide with some common events, but the extent of the deficit varies across countries. They had current account deficits continuously until 1997 Asian financial crisis which affected them significantly. The sharp depreciation that realized in their domestic currencies turned the current account deficits into surpluses in the post crisis period. While Thailand, Philippines, Malaysia and Indonesia (ASEAN -4) were having current account deficits averagely 2,79%, 3,45%, 1,56% and 1,12% in 1990s, all of them had surpluses averagely 3,30%, 1,55%, 12,95% and 2,47% in 2000s respectively.

Most Latin American countries have been living in an environment of economic crises and significant current account deficits for several years. From this perspective, they were the other group of countries that had similarities with Turkish economy for the last decades. Even though the current account balances of Argentina, Chile and Paraguay had small surpluses in 2000s, Latin American countries were generally remembered as their current account deficits. In Argentina, average current account deficit was 4,49% of GDP in1990s, which has become to small surpluses in 2000s. Its current account was in a surplus of 8 billion dollars in 2009 after global crisis, which was in a deficit of 14 billion dollars in 1998. In Brazil, average current account deficit was 1,68% of GDP in1990s, which has reduced to 0,72% in 2000s. Its current account deficit was reduced to 24 billion dollars in 2009 after global crisis, which had reached to its highest level in 1998 by 34 billion dollars. In Mexico, average current account deficit was 3,70% of GDP in1990s, which has reduced to 1,41% in 2000s. Its current account deficit was reduced to 6 billion dollars in 2009 after global crisis, which had reached to its highest level in 2000 by 19 billion dollars.

An analysis of current account balances in transition economies indicates that the opening up to external trade has been resulted with significant current account deficits. However, they had differences in both the level and the cause of the deficits. After their independence, Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Bosnia and Herzegovina, Croatia, Macedonia, Moldova and Serbia had all current account deficits averagely as 10,47%, 5,19%, 11,36%, 2,30%, 7,90%, 12,53%, 4,80%, 6,16%, 8,72%, 13,39% of their GDP's respectively. Also, African countries had always current account deficits except for oil exporters like Nigeria. Their deficits can be considered as high in terms of percentage of their GDPs; however those could be minor in billion dollars since most of them were the poorest countries among the world.

As it can be seen from the brief survey of current account dynamics of selected regions in the world, current account behavior of these regions differs according to the economic and political characteristics of the countries in that region. When analyzing the determinants of current account balance of Turkey in the empirical work, the similarities and differences between some countries in the world and Turkey can be

used to search for the relationship between macro variables and the current account deficits. Latin America seems to be the most appropriate region as Latin American Countries have been registering significant current account deficits for several years beside their crisis and fluctuated growth behaviors like Turkey.

3. THEORIES ABOUT THE DETERMINANTS OF THE CURRENT ACCOUNT

In the light of the different theoretical approaches mentioned in above sections, an overview about the factors underlying the current account balance of a country and the open debates revolving around these factors in the current economic literature will be presented in this section.

It has been very difficult to assess all of the factors jointly and compare their separate contributions to the international pattern of current account imbalances; no single theoretical model can capture the entire range of empirical relationships and there is no consensus for explanation about the pattern of current account dynamics (Gruber and Kamin, 2007, p.2). As Chinn and Prasad (2003, p.48) affirm that "alternative theoretical models have different predictions about the factors determining current account balances and about the signs and magnitudes of the relationships between the current account fluctuations and these factors."

As Aristovnik (2007, p.2) sets, the approach taken in this thesis is to view current account positions of countries as a reflection of their saving and investment balances and thus characterize the fundamental determinants of their levels in the long term perspective rather than the factors influencing the short run dynamics of the current account. Even though such an approach is essentially empirical, it also relies on various theoretical models for identifying these fundamental determinants and interpreting their impacts on the current account levels. The choice of the set of explanatory variables which are listed below are motivated by existing debates of these various theories about the current account behavior assuming that there is stationary underlying structure that links the current account balance to these macroeconomic variables.

3.1 DOMESTIC FACTORS

3.1.1 Structural Macroeconomic Factors

3.1.1.1 Domestic Output Growth

It has been argued traditionally that beside the exchange rate, import demand is a function of domestic country's income whereas export supply is a function of foreign countries' income. Thus, when a domestic country's output (income) grows, its demand for foreign goods and services accelerates which results with the deterioration in the trade balance and causes the current account to deteriorate since the trade balance is a largest component of size in the current account. Corsetti et al (1998) clarify simultaneous increase in the growth rates of output and the current account deficit for the eight Asian countries in the 1990s before the financial crisis. Calderon, Chong and Loayza (2000) also show the positive relationship between the output growth rates and the current account deficits for 44 developing countries by arguing that correlation of growth with investment is larger than with saving so that growth of the output increases the current account deficit through change in the difference between saving and investment in national income identity. Moreover, if growth is associated mostly with investment, it can be a signal for higher output in the future due to increase in the productive capacity which causes current account deficits today since the probability of the ability of a country to pay its deficits in the future increases (Gruber and Kamin, 2007).

Although an increase in the domestic output is expected to cause a current account deficit; there are some alternative views about the issue. Aristovnik (2007) argues that growth is more correlated with saving than investment and leads to an improvement in the current account balance. In his work on MENA countries he finds that a rise in the GDP growth rate causes an improvement in the current account and he supports this with the observation that many MENA countries have generally been net creditors to other countries over the sample period used. Chinn and Prasad (2000) declare similar results for their panel estimates of 18 industrial and 71 developing

countries that the output growth accounts for smaller current account deficits for industrial countries.

Contradicting theoretical views and empirical results may be explained by the behavior of growth and household's perceptions about it. Considering the representative household trying to maximize the intertemporal utility with respect to budget constraints of each period, we can claim that if the increase in output is permanent households will increase consumption which leads to a current account deficits, and if the increase in output is temporary households will smooth their consumption and save more which leads to a current account surpluses (Glick and Rogoff, 1995).

3.1.1.2 Investment

Investment, by increasing the productive capacity and expected future income, is an indicator for sustainability and thus expected to increase current account deficits today. Also, national income identity reveals that the current account can be defined as saving minus investment, hence it can be expected theoretically that increase in the investment level leads to a current account deficit. Aristovnik (2007) shows this negative correlation for the MENA countries empirically. He also distinguishes between temporary and permanent shocks in investment activities that in the short term, investment activities are more greatly financed with foreign capital inflows. However, sustainability feature of the investment is to be carefully implemented. If the investment is directed to the less productive sectors which leads to the return from that investment is lower than the cost of borrowing, or heavily to the nontrading sectors which do not induce foreign exchange revenue, it will be one of the major reasons impeding the country's external debt repayments. Corsetti et al (1998) considers these to explain why the Asian financial crisis occurred even though the Asian countries prior to crisis had credible investment/GDP ratios up to %40.

3.1.1.3 Saving

Cross country empirical works suggest that current account deficits are mainly due to fall in saving rather than increase in investment. Fall in savings means increasing consumption and import demand resulting with current account deficits. Freund (2000),

by analyzing 25 industrial countries in terms of current account reversals, points out that decrease in the saving rate is one of the important reasons for the deterioration of the current account balance. Calderon et al (2000) also find this relationship but they distinguish between the public and the private saving rates. According to their results, public saving variable is more significant and substantial than private saving for the current account deficits. They claim that shocks in the private saving rate are more heavily offsetted by increase in the investment rates than shocks in the public saving rates. Thus, implementing an increase in the public saving rate emerges as a more powerful policy action for short run improvement in the current account. Corsetti et al (1998) compare the effects of the public and the private saving rates on the current account and conclude that decrease in the public saving rate is more detrimental since the decline in the public saving is interpreted as reflecting some structural shift whereas decline in the private saving is seen as temporary.

Saving rates of the other countries may also be determinants for the current account. If the total saving in the world increases, availability of the funds is going to increase and make it easier to borrow for the countries which want to consume more. Bernanke (2005) argues that an excess of saving abroad has simultaneously boosted the US current account deficit and depressed the US private saving.

3.1.1.4 Fiscal Deficit

The link between the economy's current account and the government's budget deficit is the subject of considerable policy debate and empirical testing among the economists. The traditional view suggests that increase in the fiscal deficit derives the current account into deficit by expanding the demand for goods and services including demand for imports. Large budget deficits also raise the domestic interest rates and hence the exchange rate which both causes a deficit in the current accounts (Hashemzadeh and Wilson, 2006). Also, "overlapping generations models suggest that government budget deficits tend to induce current account deficit by redistributing income from future to present generations" (Obstfeld and Rogoff, 1998). Therefore, government can impose new taxes to eliminate the current account deficits, which both reduce budget deficits and private spending (Enders and Lee, 1990). However, if the

households believe that the budget deficits today will be resulted with higher taxes in the future, they increase their saving to be able to pay higher future taxes which neutralize the impact of negative public saving due to budget deficit. This view is known as 'Ricardian Equivalence' due to David Ricardo (Ricardo, 1817). He suggests that the private sector views budget deficits as public investment and treats the public and the private investments as perfect substitutes. Thus, fiscal policies to influence aggregate demand are not useful as households reduce consumption in anticipation of future tax liabilities. The probable effects of the budget deficit on the current account are still the subject of much debate. A claim that there is a positive correlation between the fiscal and current account deficits, the twin deficit hypothesis is tested by many empirical works. However, there is no consensus about the issue until now.

3.1.1.5 Openness

Even though it has many alternative measures, openness is generally measured as the ratio of sum of the exports and imports to GDP. "The degree of openness reflects policy choices such as liberalized trade; it also indicates receptiveness to technology transfers and capacity to generate export and foreign exchange earnings to pay external debt." (Chinn and Prasad, 2003, p. 51-52). However, as more open economies attract more foreign capital, openness may increase current account deficits through increasing investment. Chinn and Prasad find a negative relationship between openness ratio and the current account balances for developing countries and positive relationship for industrial countries. Aristovnik (2007) and Gruber and Kamin (2007) and Özmen (2005) find that the degree of openness of an economy is positively correlated with its current account position.

3.1.1.6 Demography

According to Life-Cycle Hypothesis of Modigliani (1986), income varies systematically over people's lives and saving allows them to stabilize their income level. In particular, people save and accumulate wealth in their working years and dissave during the retirement or in their youth. When these dissaving periods are used to define the youth dependency ratio (the ratio of youth people to working age population)

and the old dependency ratio (the ratio of old people to working age population), the effect of the demographic profile on the current account balance can be analyzed. If these ratios are high, saving will be low which lowers the current account. Both Chinn and Prasad (2003) and Gruber and Kamin (2007) explore that the lower the youth and the old dependency ratios the better the current account balance.

3.1.1.7 Stage of Development Hypothesis (Relative Income)

Stage of Development Hypothesis for the balance of payments claims that; developing countries which are at the first stages of the development run current account deficits and when they become a developed country they start to have current account surpluses. The reason for this outcome can be presented as developing countries are especially labor abundant and poor in terms of capital; they import capital from the developed countries and record a current account deficits. Furthermore, Life-Cycle Theory can be applied to the countries and we can expect that countries with low income dissaves (borrows) at the expense of future income. Stage of Development Hypothesis is tested by using the relative income variable which is the ratio of per capita income of the country to the average of all countries. Hypothesis predicts that the lower the relative income, the higher the current account deficit. Findings of Chinn and Prasad (2003) support this hypothesis.

3.1.2 Financial Factors

3.1.2.1 Financial Deepening

The definition of this variable can be viewed as a measure of the depth and sophistication of the financial system which offers greater liquidity, security and opportunities for diversification. The ratio of some monetary aggregates to GDP or credit expansion is often used as a proxy for financial deepening.

In a more secure and complicated financial environment, people are encouraged to save more which makes the current account balance better. Thus, we can mention about the positive correlation between the financial deepening and the current account. Financial deepening also affects investment decision; it broadens investment

opportunities and causes the current account to deteriorate. “Financial deepening can also lead to higher current account deficit by increasing consumption via loosening liquidity constraints.” (Özmen, 2005, p.558). Hence, the net effect of this variable on the current account depends on whether it affects saving or investment more. Chinn and Prasad (2003) and Aristovnik (2007) find positive relationship between the current account balance and financial deepening and interpret this as financial deepening induces more saving than investment. In contrast, Gruber and Kamin (2007) find a negative relationship and thus put investment forward rather than saving.

3.1.2.2 Inflation

Inflation serves as a macroeconomic uncertainty and lack of monetary credibility. In such an environment, people do not make much investment and increase their saving through precautionary motive leading to a lower current account deficit. While Calderon et al (2000) find that inflation lowers the current account deficit by using inflation itself; Özmen (2005) finds the similar result by using macroeconomic credibility variable as inverse of the logarithm of the inflation.

3.1.2.3 Net Foreign Assets (NFA) Position (Or Persistency of the Current Account Deficit

Net Foreign Assets position of a country affects its investment income and the current account balance since the current account is the sum of the trade balance and the net investment income. Current account can be defined as the change in the NFA; by the same way, NFA is the accumulation of past current account balances. Thus, NFA or prior periods’ current account balances can measure the persistency in the current account deficits (or surpluses). Calderon et al (2000) find that the current account deficits are persistent by using the lagged value of the current deficit as an explanatory variable. Gruber and Kamin (2007) use NFA position and support the persistency in the current account balances. However, Milesi-Ferretti and Razin (1998) detect that reversals in the current account occur if the lagged values of the current account deficits are high which indicates a negative correlation between the current account and its lagged value. This result can be illustrated with the intertemporal model of the current

account because if the country's NFA position is negative today, it will have to generate current account surpluses in the future to pay its debt.

3.2 EXTERNAL FACTORS

3.2.1 Structural Macroeconomic Factors

3.2.1.1 Industrial Countries' (or OECD) Growth

An increase in the growth rate of industrial countries leads to a reduction in the current account deficits of developing countries by means of increased export demands of industrial countries and capital flows between these countries at the expense of developing countries (Calderon et al, 2000). Furthermore, Clarida and Prendergast (1999) show that deviation of the global GDP growth from its long run average leads to an improvement in the current account balance of Germany and Japan.

3.2.1.2 Real Exchange Rate

The current account of a country can be deteriorated when the real depreciation in that country takes place since the depreciation raises the value of predetermined level of imports while it decreases the value of exports. As the time passes, decrease in the value of the home currency in terms of others stimulates the volume of exports according to the law of demand. This worsening of the current account immediately after real currency depreciation and beginning to improve later, is called a J curve hypothesis. However, the change in the export revenue and the import receipt depend on the elasticities. When the sum of import demand and export supply elasticities are greater than unity in absolute terms, i.e. Marshall-Lerner condition holds, depreciation of the real exchange rate improves the current account.

3.2.1.3 Terms of Trade

Terms of Trade, which are defined as the price of exports divided by the price of imports affects the current account balance positively. When there is a decrease in the terms of trade (terms of trade shock), there will be a decline in the foreign trade income which causes a decrease in the savings and deterioration in the current account balance.

This is called Harberger-Laursen-Metzler (HLM) effect in the economics literature. Even though low levels of income cause imports to fall, effect of the terms of trade shock on the savings dominate this import decline. Calderon et al (2000) find supporting evidence for HLM effect by obtaining negative relationship between terms of trade and the current account deficit.

Terms of trade volatility can be another candidate for the determination of the current account balance. Chinn and Prasad (2003) argue that countries with more volatile terms of trades are less attractive for international capital and this volatility induce more precautionary saving with lower investment. Thus, higher terms of trade volatility should associated with better current account balances. Nevertheless, their argument is supported with by only for African countries such that they find negative relationship between the current account balances and the terms of trade volatility for industrial countries in their sample.

3.2.2 Financial Factors

3.2.2.1 World Interest Rate

International real interest rate is used as a measure of cost of external borrowing and determines the capital flows between countries. Milesi-Ferretti and Razin (1998) argues that high real interest rates increase the cost of borrowing for developing countries and reduce the incentive for capital to flow to developing countries. Obstfeld and Rogoff (1998) note that when the world interest rate is above its permanent level, the current account surplus will be higher than usual for creditor countries as agents in those countries save more and widen their supply of financial capital. By the same way, as Reisen (1998) argues, debtor countries narrow their demand for international capital in response to interest rate increase.

4. SUSTAINABILITY OF THE CURRENT ACCOUNT DEFICITS

The current account balance and its sustainability are important parameters to both policymakers and investors since they measure both the economic performance of a country and change in its national net indebtedness.

> *It is not only important to determine the sources of the current account deficit but also the size and the time profile of the balancing adjustment, such an evaluation will make long run sustainability and persistency of the current account deficit a benchmark which authorities should be aware. (Reisen, 1998, 15).*

Large and persistent current account deficits are often assumed to play an important role in the dissemination of currency crises and are considered as early warning indicators (Zanghieri, 2004). The currency crises in the Chile, Mexico and Argentina are often associated with large and persistent current account deficits. Edwards (2001) provides empirical evidence that probability of a country experiencing currency crisis increase with large current account deficits. However, external imbalances need not to be end up with currency crisis. Kaminsky, Lizondo and Reinhart (1998) outline that in various studies carried out to explain financial crises; there is no single best indicator and a large number of explanatory indicators are used in the prediction of potential financial crisis.

A country will be able to sustain its current account deficit as long as it can find external borrowing. Although this can be feasible in the short run, the ability of the country to service its debt by referring to further borrowing is likely to be questioned once the deficit become persistent. As Hakkio (1995) states, temporary current account deficits present fewer problems as the imbalances represent the natural outcome of reallocating capital to the country that the factor of production tends to receive the highest possible returns. However, large and persistent current account deficits tend to cause more serious problems for a country and may require a policy response. “They are causes for both domestic and international concern because of undesirable consequences of a forced adjustment in the economic policies if such deficits are

expected to continue." (Baharumshah, 2003, p. 466). As Wu (2000) claims, sustaining an increasing current account deficit implies measures such as increasing domestic interest rates relative to foreign to attract more foreign capital for financing the deficit. This imposes an excessive burden on future generations as the accumulation of larger debt will imply increasing interest payments and thus a lower standard of living. Hence, instead of emphasizing the current account deficits of a country at any particular point in time, economists are more concerned with its sustainability through the country's intertemporal solvency constraint.

Current account deficit as a ratio to GDP is a simple and commonly used method, which provides an opinion on the sustainability of the current account deficits. This ratio may imply the sustainability of a country's external position in that it measures the excess of domestic expenditure over domestic production as a fraction of GDP (Holman, 2001). However, an evaluation based on this ratio may not always provide sufficient information on the sustainability of the current account deficits of a country since it ignores the specific characteristics of economies of countries. Different current account deficit to GDP ratios can be accepted as sustainable for different countries according to the financial and macroeconomic fundamentals of those countries. Thus, more comprehensive concepts have been proposed in the recent economics literature to evaluate whether persistent current account deficits impose serious problems. These concepts are; solvency of foreign debt, sustainability of the current account deficit and excessiveness of the current account deficit.

Solvency is theoretically defined in relation to a country's present value budget constraint. "A country is solvent if its discounted value of the expected stock of foreign debt in the infinitely distant future is non-positive." (Corsetti et al, 1998, p.8). If a country has a current account deficit today, which has to be repaid in the future with an interest payment, it must have trade surpluses at some date in the future. A country is considered to be solvent if its economy has a capacity to generate enough trade surpluses to pay the current debt in the future.

Sustainability is defined as a case where current economic policies can be maintained at the same time fulfilling the solvency condition (Milesi-Ferretti and Razin

1996b). In other words, the current account deficit of a country is sustainable if the continuation of the current macroeconomic policy in the future does not violate the solvency constraint. Particularly, Mann explains this 'current macroeconomic policy' concept with some economic variables;

> *A current account deficit is sustainable at a point in time if neither it nor the associated foreign capital inflows, nor the negative net international investment position are large enough to induce significant changes in economic variables such as consumption, investment, interest rates or exchange rates. (Mann, 2002, 134.)*

Hence, sustainability should not require any drastic shift in the economic policies or lead to crisis in order to ensure solvency. On the contrary, if the solvency criterion is obtained by a shift in the economic policies, then the current account deficit will be regarded as unsustainable.

Different empirical approaches have emerged to measure the excessiveness of the current account deficits in the literature; Glick and Rogoff (1995) rely on structural estimation of the model and focus on estimated responses to various types of shocks whereas Ghosh and Ostry (1995) use vector auto regression analysis to estimate the consumption-smoothing current account.

> *Excessiveness can only be measured by relying on a model that specifies the behavior of consumption, investment and output and yields predictions about the equilibrium in external imbalances. Then, actual imbalances can be compared to the theoretically predicted ones in order to judge whether they have been excessive or not. (Milesi-Ferretti and Razin, 1996b).*

Many developing countries have experienced substantial and persistent current account deficits in recent years; this has raised the issue of sustainability and increased the volume of studies about the measures of sustainable current account deficits in the economic literature. Researches were especially concentrated on the issue that whether the deficits result with a balance of payments crisis or not. In this respect, some sustainability criteria were developed and these were used as indicators for the crises. Several studies have used the econometric techniques such as unit roots and

cointegration analyses in order to evaluate the notion of sustainability. However, if we interpret the current account as a dynamic process in which it is determined by the outcome of the actions and expectations of forward-looking private agents, these empirical researches will not be sufficient for understanding the sustainability of the current account deficits. The issue should be analyzed both from empirical and theoretical perspectives for two main reasons. First, the current account deficit may seemed to be sustainable with the unit root tests but this can only be true for considering the ability to pay concept; it does not take into account the willingness of foreigners to continue to provide funds for the domestic country to sustain its deficits. Mann (2002) argues that in order for a country to sustain its current account deficits, foreign investors must continue to be willing to purchase its assets. If the demand for its assets is lower than the amount of supply needed for the sustainability, the interest rate it offers will be higher since the foreigners demand higher return and/or the exchange rate will be depreciate since the excess demand for foreign currencies which are treated as signals of unsustainability from the point of view of the foreign investors. Second, it does not make judgments about whether the continuing deficits would be desirable or which policies should be implemented to reduce the deficits without deteriorating the other macroeconomic conditions. Milesi-Ferreti and Razin (1996b, p.2) criticize the solvency and empirical studies related to it by arguing that those consider only ability to pay but abstract from the willingness to pay; "The present value of the trade surpluses may theoretically be sufficient to repay the country's external debt, but the country may lack sufficient incentives to divert output from domestic to external use in order to service the debt." (1996b, p.2). Hence, they claim that, in order to understand the potential implications of current account imbalances, the notion of sustainability should be analyzed in a broader sense which takes into account both willingness to pay and willingness to lend considerations as well as ability to pay. Thus, in this part of the thesis, both theoretical and empirical criteria to sustain the current account deficit will be provided by considering ability to pay, willingness to pay and willingness to lend concepts. Also, policy implications will be derived by considering the interrelationship of the current account with some other variables such as the level of international competitiveness, the strength of the financial system and the degree of political stability.

4.1. SELECTIVE THEORETICAL INDICATORS FOR SUSTAINABILITY

There are several factors that contribute to current account unsustainability. Studies that use first generation crisis models such as Krugman (1979) focus on weakened fiscal conditions such as high deficits, interest payments and debt. In addition, Özatay (1996) also highlights the need to consider financing of the fiscal position. Now, the focus is the fragile financial sector which is emphasized by third generation models including Krugman (1999) and Aghion, Bacchetta and Banerjee (2000 and 2001).

In addition to the above, there are important trade and investment factors that contribute to sustainability. Second generation crisis models such as Obstfeld (1994) and Eichengreen, Rose and Wyplosz (1997) emphasize the contagion effect. Through trade and investment linkages, countries can face a weakening current account position which can lead to a crisis. If a country's exports decline because its trade partners are facing a crisis, then it hurts the trade balance and thus leads to a worsened current account position. Similarly, a country can be faced with a crisis through contagion capital outflows in neighboring countries. This is a crucial issue for a country that has large foreign portfolio investment.

Milesi-Ferretti and Razin (1996a) provide a sustainability framework that encompasses some of these factors and includes others that can impact a country's current account sustainability. They study the experiences of six countries based on this framework and identify the main indicators of sustainability. They conclude that among the indicators they study; only high exports to GDP ratios, high interest payments and appreciated real exchange rates differentiate between crisis and non-crisis episodes and the rest do not show a consistent pattern for the episodes in the sample. They also emphasize external influences, the fragility of the financial sector and political instability as playing important roles. Thus, in order to analyze whether Turkey is susceptible to a crisis we need to examine a comprehensive list of indicators which include all the relevant factors.

Persistency can be counted as a leading factor for the unsustainability of the current account deficits. A large and persistent current account deficit causes a negative net international investment position that grows larger. The financial payments arising from this position may become large enough to cut current consumption and investment. In this case, the current account deficit itself generate changes in GDP growth and thus in import spending, which make its present level unsustainable. However, if the economy grows fast, the persistency cannot itself generate these dangerous feedbacks. The higher the growth rate of the economy, the easier it is to service accumulated stock of its net international investment obligations without significantly affecting the behavior of domestic spending. Hence, higher long run growth allows a country to continue running a current account deficit for longer than a country with slower long run growth. In addition, growth signals confidence to foreign investors which increase their willingness to lend. Thus, factors that cause higher growth become important in determining the sustainability of external imbalances since they determine the country's ability to service its external obligations in the future.

Higher investment levels may imply higher future growth by constructing larger productive capacity and providing intertemporal solvency. Beside investment, high saving rates also send creditworthiness signals to international investors since they raise the ability of a country to service its debt from the investors' perspective. However, high saving and investment ratios will not be enough for future growth if the financial and capital markets are not developed enough and investment funds are not allocated according to efficiency and profitability criteria. Accumulation of human capital, increase in total factor productivity and FDI in high value added sectors are some other factors for high and stable growth in the future.

Composition of international financial obligations has strong influence on the ability of an economy to sustain its deficits. Equity financing such as FDI and portfolio investments do not require payments to investors and share the burden of negative shocks between the home country and international investors. However, debt financing such as bonds and other loans require payments at specific dates and home country bears the whole burden of negative shocks (Milesi-Ferretti and Razin, 1996a). Thus, the

lower the stream of payments that is required to international investors, the longer the country can run current account deficits. The structure and composition of these financing alternatives are also important. In case of equity financing; FDI are more stable and have long term structure than portfolio investment and higher FDI can have positive impact on sustainability whereas excessive dependence on portfolio investment increases the potential of a crisis. In case of debt financing; currency composition, interest rates and maturities determine the vulnerability of country. The higher the share of obligations in the country's own currency, the less vulnerable the country is to negative shocks such as exchange rate adjustments. Hence, a country that issues assets mostly in its own currency, at low interest rates and with a high share of equity can continue along its path of consumption and saving for longer than could a country that borrows in currencies other than its own, at high interest rates with a high share of debt.

Openness, in both type of its definition, improves a country's ability to repay its debt. If it is defined as export to GDP ratio; higher levels of exports provide necessary foreign exchange to reduce external indebtedness, and debt service absorb lower fraction of the export receipts (Milesi-Ferretti and Razin, 1996a). Growth and the growth potential of the export sectors are also important for sustainable current account deficits. In case of capital inflow fluctuations, high growth rate export sectors can be safeguards for the source of foreign exchange; if a country can increase its export revenue, it does not have to decrease its imports to balance the payments which have adverse consequences on the domestic industries relying on imported inputs (Sachs and Williamson, 1985). If openness is defined as sum of exports and imports to GDP ratio; international investors will perceive the more open economy as less risky and thus sudden reversals of capital inflows will be less likely since the cost of unsustainability of the current account deficit in terms of debt default will be higher through trade deteriorations if the economy is more open. Also, open capital account could serve as a signal of a country's commitment to pursuit of sustainable policies and thereby raise foreign investors' perception of the country's creditworthiness (Milesi-Ferreti and Razin, 1996a). However, heavy dependence on export sector increases a country's vulnerability to external shocks such as decline in foreign demand in recessions or terms of trade fluctuations. From a policy perspective, protectionist trade policies limit the

export and import base hence make countries more vulnerable and their current account deficit less sustainable.

Complicated and strength financial sector with alternative forms of financial intermediation have considerable impact on the willingness to lend from the international investors' point of view. Also, countries with higher Foreign Exchange (FX) reserves to Foreign Debt ratio and higher interest rates attract more capital inflow since these are the indicators for secure and profitable portfolio investment. There are so many other factors that determine the investors' willingness to lend such as risk-return profile of the home country relative to other countries, the growth rate of the investors' portfolio of wealth, transaction costs, information and regulation (Branson and Henderson 1985).

Political situation of a country can affect the sustainability of the current account deficits since investors become more susceptible to the risk of a sudden policy reversal in case of a political instability. A government may have difficulties in implementing necessary economic policies to accommodate a negative shock in current account because of a lack of enough political power and support of public. Moreover, it may be unwilling to implement some economic policies or reforms if it is facing with election in the near future although it has sufficient power. Timing of elections, the party composition of government and the degree of support of the government can be counted as the indicators of political situation in a country (Milesi-Ferretti and Razin, 1996a).

Fiscal unsustainability can lead to current account unsustainability. Higher fiscal deficit to GDP and interest payments to GDP ratios indicate a poor fiscal position and are detrimental to a country's ability to pay and foreign investors willing to lend. Hence, a weaker fiscal position has the potential to make the current account deficit unsustainable.

When the global economic factors are considered, world growth rates affect the sustainability of the current account of a country through trade and investment channels. Lower growth rate in the world decreases capital inflows, FDI and import demand of

other countries which all causes the current account deficit become unsustainable. In addition, world interest rates emerge as an important indicator for unsustainablity. Higher world interest rates have potential to draw resources away from a country through both affecting a country's ability to pay and foreigners' willingness to lend.

4.2. SOLVENCY OF DEBT IN INTERTEMPORAL MODEL

Husted (1992) developed a theoretical framework to test for sustainability of current account based on the long run relationship between the exports and imports by adopting Hakkio and Rush's (1991) procedure for the fiscal sustainability.

The model starts with a representative consumer who lives in a small open economy that produces and exports a single composite good and has no government. The agent is able to borrow and lend in international markets using one-period financial instruments, faces a given world rate of interest, and is assumed to maximize lifetime utility subject to budget constraints. The agent's resources are composed of endowments of output and redistributed profits from firms. These resources are used for consumption and saving. The budget constraint of this individual in any period is given by;

$$C_t = Y_t + B_t - I_t - (1+r_t)B_{t-1} \qquad \text{(Eq. 3)}$$

where C_t denotes current consumption; Y_t is output; I_t is investment; r_t is the world interest rate; B_t is international borrowing, which could be positive or negative; and $(1+r)B_{t-1}$ is the initial debt of the representative household, corresponding to the country's external debt. Since equation (3) must hold for every time period, all periods' budget constraints can be added up to form the economy's intertemporal budget constraint as;

$$B_t = \sum_{i=1}^{\infty} \mu_i TB_{t+i} + \lim_{n\to\infty} \mu_n B_{t+n} \qquad \text{(Eq. 4)}$$

μ is discount factor which is $\mu_i = \prod_{s=1}^{i} \beta_s$ and $\beta_s = \frac{1}{1+r_{t+s}}$

where $TB_t = Y_t - C_t - I_t = X_t - M_t$ (Eq. 5)

represents the trade balance in period t, X is exports, M is imports. Assuming the world interest rate is stationary with unconditional mean r, equation (3) can be expressed as;

$$M_t + (r_t - r)B_{t-1} + (1+r)B_{t-1} = X_t + B_t \qquad \text{(Eq. 6)}$$

Rearranging this equation for B_t and defining the

$$Z_t = M_t + (r_t - r)B_{t-1} \qquad \text{(Eq. 7)}$$

Hakkio and Rush (1991) and Husted (1992) obtain the following relationship;

$$Z_t + r_t B_{t-1} = X_t + \sum_{j=1}^{\infty} (\mu)^j \left(\Delta X_{t+j} - \Delta Z_{t+j}\right) + r \lim_{n\to\infty} (\mu)^{n+1} B_{t+n} \qquad \text{(Eq. 8)}$$

Subtracting X_t from both side of equation (8) and multiplying by (-1), left hand side of equation becomes the current account of an economy. Furthermore, by assuming the limit term that appears in equation is zero, X_t and Z_t follow random walk with drift and adding the residual term, the following regression model can be obtained;

$$X_t = \alpha + \beta MM_t + \varepsilon_t \qquad \text{(Eq. 9)}$$

where $MM_t = M_t + r_t B_{t-1}$ (Eq. 10)

measures imports of goods and services plus net interest payments plus net unilateral transfers. The necessary condition (weak form) for the economy to satisfy its intertemporal budget constraint is the existence of a stationary error structure, that is, ϵ_t in equation (9) should be an I(0) process. On the other hand, failure to detect co-movements between exports (inflows) and imports (outflows) would indicate the economy fails to satisfy its budget constraint, and therefore, is expected to default on its debt (Hakkio and Rush, 1991). Hence, such a finding provides evidence against the sustainability of the current account balance. One can then use this criterion to search for the sustainability of the current account deficit.

The necessary and sufficient condition (strong form) for the intertemporal budget constraint model is the existence of a vector (α,β) such that ϵ_t is a stationary process and (α,β) = (0,1). In other words, if exports and imports are cointegrated with cointegrating vector b = (1,-1), then the economy is said to satisfy its strong form of the intertemporal budget constraint in the long run. Such a relationship would imply that the two series would never drift too far apart. Equation (9) above provides a useful framework for testing the sustainability of current account deficits (or surpluses).

4.3. EXCESSIVENESS OF CURRENT ACCOUNT

According to intertemporal model of current account determination by Ghosh and Ostry (1995), when national cash flow increases there will be a current account deficit where national cash flow is computed as the difference between GDP and investment and government spending. $(y_t - i_t - g_t)$

Ghosh and Ostry (1995) argue that a country is more likely to borrow if they are growing. The model assumes a small open economy that has a single infinitely lived representative agent. The agent's utility function is given by

$$U = \sum_{i=0}^{\infty} \beta^i E[U(C_{t+i})] \qquad \text{(Eq. 11)}$$

where β is the discount rate between 0 and 1, u is the utility function and c is consumption of a single traded good. The period utility function $u(C)$ is strictly increasing in consumption and strictly concave: $U'(C) > 0$ and $U''(C) < 0$. Utility is maximized subject to a dynamic budget constraint given by

$$b_{t+1} = (1+r)b_t + y_t - c_t - i_t - g_t \qquad \text{(Eq. 12)}$$

where b is the level of foreign bonds held by the economy, r is the world rate of interest, y is GDP, i is the level of investment, and g is government expenditure. The current account balance is given by

$$ca_t = b_{t+1} - b_t \qquad \text{(Eq. 13)}$$

Taking expectations and eliminating future values of the stock of foreign assets results with the intertemporal budget constraint;

$$-(1+r)b_t = \sum_{j=0}^{\infty} \frac{1}{(1+r)^j}\left[E_t\left(y_{t+j} - c_{t+j} - i_{t+j} - g_{t+j}\right)\right] + \lim_{T\to\infty}\frac{1}{(1+r)^T}E_t(-b_{t+T+1}) \quad \text{(Eq. 14)}$$

In order to the country's budget processes be externally solvent, necessary conditions for the representative agent's optimal consumption decision problem include;

$$U'(C_t) = \beta(1+r)E_t[U'(C_{t+1})] \quad \text{(Eq. 15)}$$

$$c_t^* = \frac{r}{\theta}\left\{b_t + \frac{1}{1+r}E_t\left[\sum_{j=0}^{\infty}\frac{1}{1+r^j}\left(y_{t+j} - i_{t+j} - g_{t+j}\right)\right]\right\} \quad \text{(Eq. 16)}$$

where c_t^* is the optimal path of consumption and θ is the proportion that reflect consumption tilting which is given by the relation between rate of interest r and the rate of time preference β. If $\theta < 1$, then the country is consuming more than the national cash flow which means the country is tilting consumption to the present. If $\theta > 1$ then the country is consuming less than the national cash flow which implies that the country is tilting consumption to the future. If $\theta = 1$ then consumption equals the national cash flow. There is no consumption tilting in this case. From optimal consumption c_t^*, we can compute the optimal consumption smoothing current account ca^* as follows

$$ca^* = q_t - i_t - g_t - \theta c_t^* \quad \text{(Eq. 17)}$$

where $$q_t = y_t + rb_t \quad \text{(Eq. 18)}$$

If output rises relative to its permanent value, then there is a current account surplus implying that the country is lending. If output falls below its permanent value, there is a deficit reflecting borrowing. This is consumption smoothing behavior. Ghosh (1995) argues that the focus on the consumption-smoothing current account is valid for two reasons. Firstly, it is simpler to model borrowing or lending behavior for consumption smoothing rather than consumption tilting. Also, consumption smoothing

is a stationary series which implies that standard econometric techniques may be used. Combining equations (16) and (17) we get the optimal consumption smoothing current account

$$ca_t^* = -\sum_{j=1}^{\infty} \frac{1}{(1+r)^j}\left[E_t\Delta\left(y_{t+j} - i_{t+j} - g_{t+j}\right)\right] \qquad \text{(Eq. 19)}$$

or in short;

$$ca_t^* = -\sum_{j=1}^{\infty} \frac{1}{(1+r)^j}\left[E_t\Delta\left(Z_{t+j}\right)\right] \qquad \text{(Eq. 20)}$$

where Δ is the backward difference operator such that $\Delta = x_t - x_{t-1}$ From above equation, the optimal consumption smoothing current account is related to the present discounted value of the expected changes in the national cash flow. And comparing this optimal consumption smoothing current account with actual consumption smoothing current account, it can be judged whether the current account deficit is sustainable or not.

4.4. SUSTAINABILITY IN MILESSI-FERRETTI-RAZIN (1996)

FRAMEWORK

Milesi-Ferretti and Razin (1996a) develop a simple accounting methodology in order to calculate the sustainable level of the current account deficit. They define it as the level at which external debt is stabilized at the observed level, so that the country's intertemporal budget constraint is respected. The current account identity can be rewritten, recalling that the current account position corresponds to the variation in the stock of foreign assets, as

$$s_t p_t^* F_t - s_t p_{t-1}^* F_{t-1} = p_t(Y_t - C_t - I_t - G_t) + i_t^* s_t p_{t-1}^* F_{t-1} \qquad \text{(Eq. 21)}$$

where F is the stock of net foreign assets, denominated in foreign goods, s, p and p* are the nominal exchange rate, the domestic and foreign GDP deflator, Y,C,G,I are real GDP, private consumption, government consumption and investment. The trade balance

(TB) is the difference between GDP and expenditure. Dividing both sides by nominal GDP and rearranging, we can obtain

$$f_{t+1} - f_t = \frac{1}{(1+\gamma_t)(1+\varepsilon_t)}\left[tb_t + f_t\left(r^* - \varepsilon_t - \gamma_\tau - \varepsilon_t\gamma_t\right)\right] \qquad \text{(Eq. 22)}$$

where lowercase letters indicate the ratio of the variable to nominal GDP, γ is the rate of real growth and ε the rate of real appreciation of the domestic currency. This expression states that the dynamics of foreign assets accumulation is driven by the trade balance and by a term proportional to the existing asset stock, that increases with world real rates and decreases with real appreciation and growth. If the economy is at the steady state, consumption (both public and private), investment and the stock of foreign assets are constant as a fraction of GDP. From this expression, calculated at the steady state, we can obtain the level of trade surplus a country must have in order to keep the external debt to GDP ratio constant, i.e. $f_{t-1} = f_t = f$

$$tb = 1 - i - c - g = f(r^* - \varepsilon - \gamma) \qquad \text{(Eq. 23)}$$

If FDI is taken into account, the sustainable current accounts as a percentage of GDP can be written as

$$ca = f(r^* - \varepsilon - \gamma) - fdi \qquad \text{(Eq. 24)}$$

where tb, i, c, g and f are the long-run trade balance, domestic investment, private consumption, current government consumption, and external debt as a ratio to GDP respectively. The first part of the expression reflects the fact that the economy has to be in a steady state for stabilization of the debt to GDP ratio to correspond to a sustainable trade balance. The latter part of the expression indicates the role played by the average future value of world interest rates, domestic growth and the long-run trend in the real exchange rate in determining the resource transfers needed to keep the debt to GDP ratio from increasing. This Condition also indicates that the economy's long-run absorption can be higher than its income only if the economy is a net creditor. On the other hand, net debtor economies, like transition economies, have to run long-run trade

surpluses and pay the interest on its external liabilities in order for the foreign debt to GDP ratio to remain constant. In addition, higher economic growth and real exchange rate appreciation or a lower real interest rate can sustain a larger debt to GDP ratio.

4.5. MARKOV SWITCHING MODELS TO ASSESS SUSTAINABILITY

Different tests have been developed to provide an answer to the question of whether accumulating debt due to current account deficits over time is sustainable. These tests basically assume the rate of growth of the economy and the pattern for the trade balance as given, therefore implying that the economy will go on to progressing as it did in the past. These types of tests typically provide a definite answer: they reject sustainability or not. This method offers an alternative complementary procedure inspired by the reality that the stochastic properties of the variables in the analysis are generally subject to structural breaks which are expressions of policy changes taking place over the period. It imposes identifying restrictions which describes states for the current account as being related to the stationary and nonstationary periods in the sample period, and hence, it appears to be consistent with the long run budget constraint. This type of analysis can accommodate situations when the debt might be sustainable in the long-run even though the economy may depart from the sustainable path for some sub periods. (Raybaudi, Sola and Spagnolo, 2004, p. 217).

Since the solvency concept is evaluated in the long-run, countries may be faced with debt problems for sub periods even though the condition of long-run sustainability holds. The purpose of the usage of Markov switching model is to discover the circumstances where the countries might satisfy the solvency criterion, but faced with important short run imbalances which may become high enough to violate solvency in the future: when the long-run sustainability condition is satisfied but the presence of temporary deviations from this condition providing a danger that country may likely to facedebt problems in the future. Therefore, it tries to identify sub periods in which the current account deficits look as nonstationary: If the time period that economy stays in these subperiods become longer, the probability of the violation of solvency will

increase. The econometric methodology proposed in the Markov switching models allows us to distinguish periods that are associated with unsustainable outcomes from those in which the solvency condition holds. (Raybaudi et al, 2004, p. 219).

5. BRIEF HISTORY OF TURKISH ECONOMY IN TERMS OF CURRENT ACCOUNT BALANCE

5.1 INTRODUCTION

Since the Turkish Republic has been established, current account balance has often been one of the central themes in constituting economic policies by attributing different significance and priorities either to itself or its sub branches in various economic regimes and has been shaped according to changing conditions and needs during that period. Whereas in 1930s creating surplus in the current account balance was a political goal for development, in the 1950s economic growth was objected by reducing the restrictions on foreign trading. While current account balance had emerged as a result of development plans during 1960s and 1970s, after 1980s liberalism on the foreign trade as well as on capital movement and export-driven growth have become a main policy.

After 1980s, there had been important changes in the balance of payments, and especially in the current account balance as well as in the policies of stabilization and liberalization. With the deregulation of foreign exchange flows and flexibility in foreign trade and capital flows, balance of payments has become result of decisions which made by economic divisions in both public and private sectors in relation to received signals from both internal and external. Current account balance stepped out of being made up of controlled foreign trade and has become a whole by integrating with net investment incomes, tourism incomes, and unilateral transfers, mainly composed of workers' remittances. The condition of current account balance after 1980s, therefore, will be examined and explained in more details comparing with previous years.

5.2 BEFORE 1980'S

5.2.1 The First Foreign Affairs of the Republic

In the early years of the Republic, Turkey's economy had shown a feature of being open to and dependent on foreign economies because of inhibitory articles of Lausanne Treaty on customs tariffs and of the privileges which foreign companies had

on the domestic economy. Since the transformation of the agricultural based structure had not been done yet nor the industry had been established, there were attempts to offset the import of industrial and consumption goods by exporting agricultural goods and raw minerals (Şahin, 2002). The compound of the export, which had been composed of a few numbers of products with 80% of them being agricultural goods, had not changed until 1930s; while the import of consumption goods was over 70%, there had been also an increase, even though in small amounts, in the import of machines during the same period. Significant increase in both imports and exports had been recorded in the beginning of the period. Continuing increase in the world's economic conjuncture and addition of convenient climate to the increase in the demand of agricultural goods had led to an improvement of exports both in the sense of price and quantity. On the other hand, although products' prices were high, imports had increased only because of low customs tariffs and thus the current account balance had a deficit. Capital movements during the period had usually been in the form of long term industrial loan and significantly low. Current account deficit had been compensated by international reserves of the country. Italy and Germany were the important foreign partners in that period because of bilateral trade agreements.

Table 5.1

Foreign Trade and Current Account Balance Developments (Million US Dollar)

	1923	1924	1925	1926	1927	1928	1929
Exports	51	95.4	112.2	108	101	112	92
Imports	87	112.8	131	135	122	126	137
Trade Balance	-36	-17.4	-18.2	-27	-21	-14	-45
Current Account Balance	-36	-18	-19	-28	-22	-11	-50

Source: Yücel (2006), Turkstat : Statistical Yearbook (2009)

5.2.2. Great Depression and Afterward

The most important reason for the rapid decrease of the volume of foreign trade, which had increased during the early years of the Republic, was the Great Depression. When the price of raw materials had hit the bottom versus consumption goods by the effect of the Great Depression, the terms of trades had been increased against Turkey, just like it had been for any other developing country at that time; with the decrease in import demand of developed countries, exports and foreign exchange

gains had been decreased and with the collapse of the international finance market, important sources of credit were closed. In addition to the Ottoman debts and foreign exchange needs resulted from the nationalization of railways, some exporters had stockpiled in expectation that customs tariff would be increased after 1929 and consequently external deficit had shown an extraordinary increase in that year.

Balance of payments problems that emerged with the great depression had been solved successfully by restrictive and inhibitory foreign trade policies. Unlike other developing countries, exchange rates were fixed and very heavy controls had been applied to foreign exchange trade. With customs law in 1929, customs tariff were significantly increased, especially against consumption goods. By issuing the Law Regarding the Protection of the Value of Turkish Currency in 1930, there had been quantity restrictions and strict controls on the imported goods. After this shrinkage in the foreign trade and hitting the bottom in 1932, it had shown increase again. Thanks to protective and restrictive policies, current account balance had shown a surplus which has led to an increase in the reserves.

Bilateral agreements and clearing agreements were mostly used policies during this period and together with import restrictions these agreements had made the economy to give surpluses in the foreign trade. By this way, structure of the imports had become compatible with industrialization policies. Tezel (1994) emphasized that bilateral clearing agreements and quotas were comprised 84% and 81% of total imports and exports respectively between 1934 and 1939. At the end of the period, with more restrictions in the imports of final consumption products with import substituted industrialization policies, compound of the imports had profoundly changed. While the share of capital and intermediate goods in the imports increased from 14% to 37%, imports of textile and foods were declined from 61% to 31%. When we analyze it from a quantitative perspective, we can see that whereas the proportion of export to GNP was 8,7% in 1926, this ratio had declined to 4,8% in 1936 and the proportion of imports to GNP in the same period had declined from 11% to 3,8%. In this period Germany had not only become most important trade partner but also had taken the foreign trade of Turkey under its control through keeping the value of Turkish currency high, tying the

foreign trade to bilateral agreements and through foreign trade organizations. Its share in the import and export volumes was over 40% by the end of 1930s.

Table 5.2

Foreign Trade and Current Account Balance Developments (Million US Dollar)

	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939
Exports	71	60	48	58	73	76	94	109	115	101
Imports	69	60	41	45	69	71	74	91	119	94
Trade Balance	2	0	7	7	4	5	20	18	-4	7
Current Account Balance	1	-4	4	14	4	5	20	18	-4	7

Sources: Tezel (1994), Hale (1981)

5.2.3. Agricultural Exports at the Course of World War II

Because of the tension in the world during the World War II, foreign trade had been barely carried out and had shown shrinkage. Taken whole control of the foreign trade through National Protection Law in 1940, the government had transferred a significant amount of income from its non-Muslim citizens by charging wealth tax on non-Muslim community in 1942, who realized the most part of the import activities. Increased import activities during 1930s had almost stopped with the explosion of the war and with the decline of the supply of imported goods. The exports on the other hand had increased, even though it showed a decline at the beginning of the era due to food and raw materials demand of Germany and its allies beginning from 1942 and so on, resulted with current account balance surpluses and reserve accumulations which had started in 1930s and could be maintained until the end of 1946 (Tezel, 1994).

Right after the war, the value of US dollar versus Turkish Lira (TL) had been increased from 1,3 TL to 2,8 TL by a serious devaluation. While this decision was criticized by some economists, the government had explained the reasons of that devaluation as; to decrease the amount of stocks that had been piled up during the war and to place the competitive power of export goods and TL value which had highly appreciated by the high inflation within reasonable levels (Kepenek and Yentürk, 1996).

Table 5.3

Foreign Trade and Current Account Balance Developments (Million US Dollar)

	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
Exports	81	91	126	197	178	168	238	222	196	246
Imports	50	53	113	155	126	97	124	243	274	288
Trade Balance	31	37	13	42	52	71	114	-21	-78	-42
Current Account Balance	30	36	12	40	51	70	132	-9	-66	-30

Source: Tezel (1994)

With the change of government in 1950, foreign trade, after the tight control and constrictions during World War II, had finally begun to liberalize. The Korean War and the economic conjuncture of the world, together with convenient climate conditions had enhanced the yield in the agriculture and improved the exports around 50%. Krueger (1974, p.182) had even argued that Turkey had a monopoly power with its production ratio of 15% in the total global exports of products such as dried grape, dried fin, and nut. However, the over-liberalized policy that had been followed during that period had caused the import demand to incline dramatically, and with the adverse climate conditions export activities had shrunk. Gold and foreign exchange reserves had melted, and the unwillingness of the government to devaluate the over appreciated TL, which was trying to fund the external deficits through external loans, as well as it's unwillingness to apply economic stability measures had caused the foreign credits to decline. It had also failed to overcome high inflation and deficit of payment balance. The government had finally commenced a stabilization program by reforming the foreign trade through several decisions taken on August 4, 1958. According to that two years program the value of the US dollar had been increased from 2,8 TL to 9 TL, the emission had been limited, bank credits had been frozen, prices of products of state economic enterprises had been raised, foreign trade had been reliberalized and consequently foreign debts had been consolidated and reconstructed. Furthermore, long-term new loans had been able to be taken. Finally, by the increase of foreign loans and export, the economy had been survived. But even though foreign trade had improved, imports activities had improved more than the exports, and the deficit in the current account balance had been increased.

Table 5.4

Foreign Trade and Current Account Balance Developments (Million US Dollar)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Exports	263	314	363	396	335	313	305	345	247	354	321
Imports	286	402	556	533	478	498	407	397	315	470	468
Trade Balance	-23	-88	-193	-137	-143	-185	-102	-52	-68	-116	-147
Current Account Balance	-50	-94	-198	-164	-177	-177	-75	-64	-64	-145	-139

Source: Karluk (2004)

5.2.4 Current Accounts in the Development Plans

When planned industrialization attempts had replaced the 1950s' agricultural based economy in 1960s, balance of payments were placed as secondary aim of those plans. During the First Five Year Development Plan (1963-1967), beside the success of import substitution industrialization (ISI) policy, exports had increased more than it is expected to have. Imports had also improved and the share of imports of consumption goods in total import had declined to 3,5%. On the other hand, in the second five-year development plan (1968-1972), expected capital inflows had not been realized and increased value of TL had caused the exports to improve less than it is expected.

Also, despite the industrialization policy, exports had kept its agricultural based structure and exports of industrial goods had not shown a distinctive improvement. While the current account deficit was increasing before 1970s, expectation of funding this deficit through foreign resources had not been realized and foreign exchange bottleneck had emerged. Failing on closing the gap by a multiple exchange rate system, the government had increased the value of US Dollar from 9 TL to 15 TL by re-devaluation of TL on August 10, 1970 against the pressure of foreign credit resources. Decisions of 1970 had resulted in positive outcomes during the subsequent 4 years; the increase in foreign currencies through workers' remittances and export had partially offsetted the foreign trade deficit, gold and foreign currency reserves had been increased and current account balance even had a surplus in 1973. In 1974, however, oil price had increased by four times and consequently import payments had increased; exports could not be improved because of the recession in the countries where the foreign trade had been done mostly. Because of the appreciation of TL; the deficit of foreign trade had

begun to increase again. While the deficit of current account deficits had reached a record level in 1977, government had to borrow short term credit with high interest rates because of the decrease in feign currency of workers' remittances and the challenge of finding new loans. After the second shock of oil prices, the economic crises and exchange currency bottleneck had been followed by new devaluations and Decisions of January 1980.

Table 5.5

Foreign Trade and Current Account Balance Developments (Million US Dollar)

	1963	1968	1973	1978
Exports	368	496	1317	2288
Imports	688	764	2086	4599
Trade Balance	-320	-268	-769	-2311
Current Account Balance	-300	-231	484	-1420

Source: Şahin (2002)

5.3 A JOURNEY FROM FOREIGN TRADE BALANCE TO CURRENT ACCOUNT BALANCE

5.3.1 Export as a Passion in the Liberalizing Economy: 1980s and Transformation

The balance of payments of Turkey had undergone significant changes in the 1980s along with the stabilization and liberalization programs that had been introduced in 1980. With the opening of trade and capital movements, the key position of balance of payments as a development means of the earlier periods had shifted with the lifting of controls and restrictions on the foreign exchange flows between residents and non-residents. Instead, the balance of payments had become the consequences of the decisions of economic agents from public and private sector in response to domestic and external signals. In this context, while this overall change in the structure of balance of payments was taking place, the relationship between balance of payments and economic growth had also changed. In the pre-1980 period when the capital flows were negligible, the changes in the components

of the current account balance (namely, exports, imports and workers' remittances) was bound to strict controls and regulations on foreign trade and exchange rate. The main objective of the government was to attain economic growth and all the domestic policies as well as foreign trade and foreign exchange rate policies were diverted at this objective. In this sense, inflows in the balance of payments (namely, in the current account balance) had contributed to economic growth before the 1980s. In contrast, in the post-1980 period, with the financial, trade and capital account liberalization, the capital inflows had started to play an increasing role in the domestic economy and become one of the major factors behind the economic growth. Therefore, economic growth fuelled by capital inflows had become the major determinant of the current account balance in the aftermath of the liberalization of the economy. Besides, current account deficits had become a source of concern in the 1990s reflecting dangers in the economy that may lead to a balance of payments crisis (Yücel, 2006).

The most prominent issues in the policies of 1980s had been regarded as overcoming the foreign debt payments problems by increasing the foreign currency stocks and achieving export-based growth by improving external economic relations. In this context, the most important feature of decisions of January 24 that had been taken after the foreign currency bottleneck caused by oil shocks was the necessity of openness of the economy and continuation of this openness. It had also emphasized the necessity of all sectors have to tend toward to export and it had achieved this objective successfully (Serin, 2001).

The main goals that had objected by decisions of January 24, which can be regarded as the beginning of the period prominent with liberalization of foreign trade, internal markets, and international capital movement respectively, were to find solutions for external payments, to decline the inflation and, to enhance the growth rate (Owen and Pamuk, 1998). When we examine the decisions in terms of current account balance, primary subjects were the devaluations that had been done in TL in order to improve the export inducements, export inducements, removing the controls and quotas on import step by step in order to liberate the importation, and liberation of financial system.

While the value of the US Dollar had been increased from 47 TL to 70 TL as a result of those decisions, there had been other devaluations in small range afterward and following the daily exchange rates which means that exchange rates had been determined by Central Bank of Turkey in short intervals from 1981 on, which had been switched to floating exchange rate system in 1984. Beside the devaluation of Turkish Lira, the tax-return application on export had been maintained in order to stimulate the exports. Also, the exporters had been given priorities for achieving foreign exchange and taking loans for their transactions. However, due to misuse of these incentives, tax-return that was provided to the exporters had been decreased in 1984 and totally abolished in 1988. The liberalization of imports, on the other hand, had been slower and narrowly scoped. While quota limitations were removed step by step until 1985, tariffs remained same and even raised in 1986-1987. Financial reforms had started with establishment of institutions such as Istanbul Stock Exchange, Capital Markets Board, and markets of exchange and gold along with the treasury's export of bonds to international markets and had been continued by liberalization of capital markets and complete convertibility of TL in 1989. The goals of these liberalization attempts had been thought to be enhancing foreign trade volume by facilitating the exchange market and trading, improving the tourism incomes, decreasing the off the books activities and attraction of foreign investments which had been done with relative success.

Table 5.6

Selected Items from the Current Account Balance (Million US Dollar)

	1983	1984	1985	1986	1987	1988	1989	1990
Exports	5905	7134	7959	7457	10190	11662	11625	12959
Imports	8895	10044	10935	10475	13396	13475	15815	22407
Trade Balance	-2990	-2910	-2976	-3018	-3206	-1813	-4190	-9448
Net Tourism Income	220	271	770	637	1028	1997	1992	2705
Net Investment Income	-1441	-1503	-1553	-1877	-2085	-2513	-2327	-2508
Net Interest Income	-1081	-1440	-1455	-1793	-2005	-2425	-2223	-2347
Current Transfers	2011	1988	1916	1840	2323	2089	3427	4365
Workers' Remittances	1553	1807	1714	1634	2021	1776	3040	3246
Current Account Balance	-1828	-1439	-1013	-1465	-806	1596	938	-2625

Source: CBRT Statistical Data (Balance of Payments Analytical Presentation)

As it is understood from the table above, successful results had been achieved in foreign trade and current accounts from implemented policies in 1980s. Exports had doubled, especially in the first half of 1980s with a continuous and high rate of increase and this increase had continued even though it had lost some of its acceleration. In this period, as a result of liberalization of the imports, import volume had increased, together with the significant decrease on import of banned goods and reduction in tariffs by 1990s had caused the deficit of foreign trade balance to deepen but thanks to ensured increases in service accounts the huge deficits in the current accounts had been prevented.

By the rearrangement of the balance of payments account according to international standards since 1984, the scope of current accounts balance had been expanded and from that year on, with increase in both service accounts and workers' remittances current accounts had reached significant amounts quantitatively. The net tourism incomes that had been barely visible, had shown continuous increase with the provided aids to the sector during 1980s and even though it was remained low comparing with similar Mediterranean countries', it had constituted 21% of total exports by 1990s. Newly take place in the current account balance, workers' remittances in the same period had been high enough to be considered even though it had been highly volatile. The payments of interest of external loans, however, had always been a burden on the balance. Although it had been started to gain interest income on sales of credited goods and service, net interest income had never been positive.

The incentives that had been applied to export, devaluations of TL, decreasing the production costs by suppressing the wages and reducing the internal demands, financial liberalization and institutionalization, obviously had been important factors for export oriented openness of Turkey's Economy on increasing the weight of current account balance and balance of payments on the economy, and particularly on export to show significant increase comparing with previous periods. This growth in the export during the 1980s had not been depended only on economic policies but also had been effected by external developments. Increased purchasing power of Middle East

countries and the war between Iran and Iraq in this period could be counted among the factors that had increased the exports. However, the decrease in the oil prices after 1980s and the increase in incomes of service trade and foreign investment in form of external loan had caused an increase in imports so that current accounts had deficit.

Table 5.7

Composition of Exports and Imports

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
	Composition of Exports (% Share in Total Exports)										
Agriculture	56,5	46,6	36,5	32,3	23,9	20,8	24,1	17,6	19,7	15,9	15,8
Industry	36,9	49,3	60,4	64,4	72,7	76,1	72,7	79,7	77,2	80,5	81,7
Mining	6,6	4,1	3,1	3,3	3,4	3,0	3,3	2,7	3,1	3,6	2,5
	Composition of Imports (% Share in Total Imports)										
Investment Goods	10,1	12,7	14	13,8	13,1	16,1	21	16,8	17,8	16	18
Intermediate Goods	85,3	83	81,2	81,8	82,1	78	71,7	76,1	75,5	79,3	72,5
Consumption Goods	4,6	4,2	4,8	4,4	4,9	5,9	7,3	7,2	6,7	4,7	9,4

Source: TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Economic Activities, ISIC REV.3" ;
TURKSTAT, Foreign Trade Statistics "Foreign Trade by Classification of Broad Economic Categories"

Beside the quantitative developments in foreign trade, there had also been some important structural transformations and it had been observed that there were changes within the composition of export and import during the period. While the rate of agricultural products in total exports was 56% in 1980, this rate was 15% in 1989 and the rate of industrial products in total exports had increased from 37% in 1980 to 80% in 1989. In the composition of the imports, however, even though investment goods and intermediate goods had partly protected their place as a result of applied industrialization policies until that period, it had been seen a small increase in the proportion of consumption goods as a result of liberalization of imports. While the rate of consumption goods was 4% at beginning of the period, by the end of the period this rate was closing to 10% and the share of raw materials and intermediate goods had declined from 85% to 72%.

5.3.2 The Lost Years: 1990s and Current Account Deficits in the Shadow of Crises

When the Turkish economy is examined in a historical sense, it is seen that the most memorable feature of this period were, unfortunately, the economic crises that

country had gone through. The characteristics of this period in which the foreign oriented economy structure had been completed following to full convertibility in 1989 were economic fluctuations and crises caused by both internal and external reasons (Yücel, 2006). While it has integrated with the world in terms of economy, Turkey had been significantly affected by external events such as gulf crisis, South East Asia crisis in 1997, and lastly by Russian crisis in 1998 and in the meantime it had heavy crises in 1994 and 2001 because of economy had not been managed well.

Liberalization of capital movements and increase of capital flows had enabled the governments to carry out easy macroeconomic policies which had led to an increase in budget deficit. Moreover, foreign trade with regional neighbors had not only been narrowed before and after the Gulf War but also the military expenses had been outstandingly increased because of the terror in southeastern Anatolia and this had been another factor for increase in public deficit and for the necessity of borrowing (Şenesen, 2002). In order to ensure loan from both internal and external markets the interest rates had been continuously increased and sustaining of this debt-interest circle had not only made the country dependent on short term capital flows and fragile but it had also caused the demand for foreign exchange within the domestic market as well as an increase in value of the TL and consequently the deficit in both foreign trade and current account balance had reached a point that can be seen as a record in 1993. As a solution, government had tried to control the interest rate and cancelled the treasury auctions which led to a financial crisis in 1994 that can be categorized as second generation balance of payments crises (Özatay, 1996). The subsequent decisions that had been taken on April 5 were intended to ensure the financial stability as well as to decrease the public sector's borrowing and to close the deficit of payment balance.

If we are to examine the decision of April 5 in terms of current account balance; exports had been improved by expanding the scope of export insurance and by decreasing the value of the TL in half. Reduction in the production and increase in the price together with devaluation of TL had led to a reduction in import so that foreign trade deficit had been significantly dropped. There had been even a surplus in the current account balance. But, persistent increase in both current account and foreign

trade deficits had shown that decisions of April 5 had not achieved their goals except for the year of 1994.

The economic crises occurred in Southeast Asian countries and in Russia had caused the international capital to resign from the developing countries like Turkey, which were seen risky. This had led to economic recession and decrease in import activities thus current account balance had a surplus in 1998. After the crises, however, the demand had narrowed in the entire world and Southeast Asian countries had to make devaluations which had affected the export negatively and current account balance had started to give deficit once again.

Persistent problems like budget and foreign trade deficits, high interest rates and the inflation had forced the government to take measures and in this context, the government had signed a close monitoring agreement with IMF and with the stand-by agreement in 1999 the government had put the Fighting with Inflation Program into action.

The program had been built on the principles of controlling cash flow and nominal exchange rates anchor. It had anticipated 20% decrease in value of TL against the exchange basket by the end of the year, in this way it had been expected that uncertainty of the markets as well as inflation expectations would be reduced. But in the economic literature it was known that this type of exchange rates anchor programs would increase the domestic demand due to the capital inflows and appreciate the domestic currency which often results with an increase of current account deficit and mostly balance of payments crisis. Eventually, this result had also applied for Turkey and the program had to be abolished in 2000 even before reaching the level of transition to free floating exchange rates in 2001 because of the excessive increase in both domestic demand and import that had caused enormous current account deficit which had led to deepest economic crisis in the history of the country in February 2001.

Table 5.8

Selected Items from the Current Account Balance (Million US Dollar)

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Exports	13593	14715	15345	18106	21636	32067	32110	30741	29031	30825	34719
Imports	20883	22791	29426	22273	34788	42331	47158	44779	38802	52882	38092
Trade Balance	-7290	-8076	-14081	-41670	-13152	-10264	-15048	-14038	-9771	-22057	-3363
Net Tourism Income	2062	2863	3025	3455	4046	4385	5286	5423	3732	5923	6352
Net Investment Income	-2663	-2625	-2744	-3264	-3205	-2927	-3013	-2985	-3537	-4002	-5000
Net Interest Income	-2505	-2444	-2765	-2620	-2192	-2235	-2818	-2773	-3459	-3657	-4358
Current Transfers	5039	3920	3652	3010	4398	4097	4511	5505	4881	4764	2987
Workers Remittances	2819	3008	2919	2627	3327	3542	4197	5356	4529	4560	2786
Current Account Balance	250	-974	-6433	2631	-2339	-2437	-2638	2000	-925	-9920	3760

Source: CBRT Statistical Data (Balance of Payments Analytical Presentation)

When we examine the quantitative developments it is seen that until the crises there had been steady increase in the exports and the imports had been fluctuated depending on the crises and the demand shrinkage. While the export had increased until the Customs Union agreement in 1996 and the crises in Asia and Russia in the subsequent years, the increase in the import had stopped with the slow down trend in the economy in 1998 and 1999 so that foreign trade deficits had been reduced. An interesting feature in the current accounts of 1990s that the tourism incomes as well as workers' remittances had reached such a volume that they had been actually capable of closing the foreign trade deficits in that period. The tourist number as well as the foreign exchange gain per tourist had increased but because of insufficient promotion and negative events such as terrorism had prevented the expected contribution of tourism incomes to current account balance. Because the debts had been paid with new debts interest payments had been remained as a burden not only on current account but also on the whole economy. The continuous increase of investment in abroad and their incomes had helped the net interest incomes to be stable in 1990s. The factors such as improvement of stock and financial markets and convertibility of TL had improved the workers' remittances and it had remained as important foreign exchange resource of the country.

Table 5.9

Composition of Exports and Imports

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
	Composition of Exports (% Share in Total Exports)										
Agriculture	17,6	13,2	13,6	11,3	8,6	9,3	9	8,8	7,8	6	6,3
Industry	80,3	85	84,9	87,2	89,6	89,1	89,4	89,8	90,8	92,5	92,5
Mining	2,1	1,8	1,5	1,5	1,8	1,6	1,5	1,4	1,5	1,5	1,1
	Composition of Imports (% Share in Total Imports)										
Investment Goods	20,5	21,1	25	22,4	22,7	23,6	23	23,4	21,6	20,9	16,9
Intermediate Goods	71,7	71,1	66,4	71,8	70,7	67,1	66,5	65,6	66,5	66,3	73,8
Consumption Goods	7,9	7,8	8,5	5,8	6,5	9,3	10,5	11	11,9	12,8	9,3

Source: TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Economic Activities, ISIC REV.3" ;
TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Classification of Broad Economic Categories"

When we analyze the foreign trade from structural perspective in terms of product and product groups, it is seen that the transformation of 1980s has been still continued. Being reduced to 17% at early 1990s, the export of agricultural products had maintained to the level of 6% by the 2000. Export of industrial products, on the other hand, had been stable at the level of 90% in the second half of 1990s whereas it had been at 80% in the beginnings of the period. There had not been observed any change within the composition of imports. While the import rate of intermediate products and investments goods had been same with their rates in 1980s, the import of consumption goods had remained limited. This situation shows that Turkey had achieved a certain progress on production the consumption goods domestically but the industry still heavily depended on import in terms of intermediate products.

5.3.3 The Period of Stable Growth : 2000s and the Records in the Current Account Deficits

Outstanding increase in the interest and exchange rates in February 2001 together with the collapse of Fighting with Inflation Program had shown to the government that there was a need of an economic program that contains more extensive reconstruction reforms and new economic measures had to be taken. Government announced a program called "Transition to the Strong Economy" on April 14, 2001 in the direction of IMF's advises and credit supports. Kazgan (2004) criticizes the program as being "a program for financial capitals to escape from the crisis" imposed by IMF. However, balance of payment was in a really bad situation because of the net capital

outflows which was equal to 10% of GNP even though there were surplus of current account balance after the crisis 2001 and making an agreement with IMF in order to ensure credit supports and arranging a program towards the recommendations of IMF had been seen as only option to rescue the economy. Program had been aimed at solving the problems such as high interest rates caused by huge public debts, exchange rate fluctuations caused by short term capital inflows and outflows because of deficit in the current account balance which were already thought by previous program. According to Şahin (2002), the program had given priority to the structural reforms which previous program had not paid attention, thus expectations could be drawn to positive levels and the program had been made more consistent.

Table 5.10

Selected Items from the Current Account Balance (Million US Dollar)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Exports	40719	52394	68535	78365	93611	115364	140999	109647	121000
Imports	47109	65883	91271	111366	134573	162041	193843	-134497	-177346
Trade Balance	-6390	-13489	-22736	-33001	-40962	-46677	-52844	-24850	-56346
Net Tourism Income	6599	11090	13364	15280	14110	15227	18445	17103	15981
Net Investment Income	-4554	-5557	-5609	-5779	-6584	-7038	-7889	-8084	-7693
Net Interest Income	-3611	-3910	-3615	-4005	-4869	-5321	-6507	-5619	-4336
Current Transfers	2433	1020	1117	1454	1908	2243	2006	2299	1329
Workers' Remittances	1936	729	804	851	1111	1209	1431	934	829
Current Account Balance	-626	-7515	-14431	-22088	-32051	-38219	-41289	-13991	-48424

Source: CBRT Statistical Data (Balance of Payments Analytical Presentation)

Giving priority to the structural reforms in the new Transition to Strong Economy program with the abundance of liquidity in the international markets plus political stability of the country had made the economy to enter a regular and rapid grow process after the crisis of 2001 and this situation had reflected in the current account balance as rapid growth in the imports with demand increase. Developments in the global economy had brought improvement in exports but these had not been enough to offset the import and trade deficits had hit the record levels concurrently. Some developments had been seen in the workers' remittances and in tourism incomes. However, they could not prevent the current account balance to have record deficits.

Table 5.11

Composition of Exports and Imports

	2002	2003	2004	2005	2006	2007	2008	2009	2010
	Composition of Exports (% Share in Total Exports)								
Agriculture	4,9	4,5	4	4,6	4,1	3,5	3	4,2	4,3
Industry	94	94,5	94,9	94,3	94,5	94,9	95,4	94,2	93,4
Mining	1,1	1	1	1,1	1,4	1,6	1,6	1,6	2,3
	Composition of Imports (% Share in Total Imports)								
Investment Goods	16,5	16,4	17,9	17,5	16,8	16	13,9	15,3	15,6
Intermediate Goods	73,9	72,2	69,6	70,5	71,6	73	75,4	70,9	71,1
Consumption Goods	9,6	11,3	12,5	12	11,6	11	10,7	13,8	13,3

Source: TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Economic Activities, ISIC REV.3" ;
TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Classification of Broad Economic Categories"

5.4 THE OUTLOOK OF FOREIGN TRADE ACCORDING TO COUNTRY GROUPS

When we examine the distribution of the country groups that Turkey has an exports relation with, for the last 30 years, it is seen that the almost more than half of the total exports has been done with OECD countries. This group is mainly composed of European Union countries which are part of Customs Union agreement. Germany has always taken the first place in Turkey's exports and often followed by other major European countries. When the appreciation in the Euro is taken into account, improved volume of exports of Turkey in the last decade become more meaningful since most of the exports are directed to the European Union. Turkey exports to Middle East have mainly depended on their purchasing power, namely oil prices so that it shows a fluctuating manner. While Turkey's export to such countries had increase during Iran-Iraq War, it has begun to decrease due to Customs Union agreement and attempts to improve the relationship with Turkic Republics since 1990s. Exports to Turkic Republics on the other hand are still in small amount but it shows signs of improvements.

Table 5.12

Exports by Selected Country Groups (% share in Total Exports)

	1980	1985	1990	1995	2000	2005	2010
OECD	68	53	71	66	62	57	54
European Union (27)	57	44	58	56	51	53	46
Islamic Conference	23	42	18	17	12	17	29
Black sea Economic Cooperation	4	2	1	11	8	11	13
CIS	0	0	0	10	5	6	9
Economic Cooperation	3	14	4	4	3	3	4
Turkic Republics	0	0	0	3	2	2	3
Africa, Caribbean and Pacific	0	0	1	1	1	2	2
Mediterranean Countries	13	9	10	10	9	9	13

Sources: TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Country Groups" ;
UFT, Foreign Trade Statistics, "Exports by Country Groups"

As it can be understood from Table below, there is similar structure in terms of imports. Most of the imports are made with OECD countries and again most of this group constituted of European Countries. Because the Black Sea Economic Cooperation organization and Commonwealths of Independent States and Turkic Republics, and economy of Turkey show complementary qualifications, our trade with these countries are increasing in terms of imports as it is in the case of exports.

Table 5.13

Imports by Selected Country Groups (% share in Total Imports)

	1980	1985	1990	1995	2000	2005	2010
OECD	53	61	68	72	67	59	54
European Union (27)	40	41	47	52	54	47	39
Islamic Conference	41	34	13	13	13	18	15
Black sea Economic Cooperation	6	2	2	11	11	15	18
CIS	0	0	0	10	12	13	16
Economic Cooperation	10	12	3	3	3	5	5
Turkic Republics	0	0	0	1	2	4	2
Africa, Caribbean and Pacific	0	2	2	1	1	2	1
Mediterranean Countries	13	10	6	5	7	5	4

Sources: TURKSTAT, Foreign Trade Statistics, "Foreign Trade by Country Groups"
UFT, Foreign Trade Statistics, "Imports by Country Groups"

5.5 WHERE IS CURRENT ACCOUNT DEFICIT GOING?

As it's seen in the Tables above, since the certain production and consumption ways were established, there had not occurred any change with the composition of

import and export and Turkey has reached the 2000s as being an industrial goods exporter country which imports mainly raw materials. Despite this, the deficits in the current accounts are still in worrying levels and at these levels there are many examples of reversal of international capitals which seems to fund these deficits.

When we examine the recent current account deficit problem of Turkey structurally, we can see some reasons reducing the concerns about new crisis. The results show that the deficit is not originated by decrease in the saving but rather because of increase in investment, which increases the possibility of maintaining the deficit. Furthermore, unlike previous years the deficit is financed by direct investments rather than debt creating instruments which reduces the risk of reversal of international capitals (Akçay and Üçer, 2006). Because of the economic crisis that have occured in all of the world at the end of 2008, there has been a decrease in both import and export and even in foreign trade and current account deficits in 2009. However, due to production structure of the economy, current account deficits will remain as important problem for Turkish economy in the next years as it starts to increase steadily in 2010.

6. EMPIRICAL WORK

Purposes of this thesis are to determine the dynamics of the current account, to develop and compare empirical criteria to judge its sustainability in cases of deficits in general, to determine the causes of the current account deficits in Turkey and to assess their sustainability through the empirical criteria in particular. For those goals the empirical and theoretical works are going to follow these steps: Firstly, the determinants of the current account deficit will be searched through Vector Auto Regresion (VAR) and Auto Regressive Distributed Lag (ARDL) models. Secondly, sustainability of the current account balance will be tested according to the different empirical methods. Thirdly, discussion of the current account position of the Turkish Economy theoretically in the light of the selective theoretical sustainability indicators will be made with generating some policy implications about the subject. Finally, evaluation of the current account position of the Turkish Economy according to the empirical results will be presented.

6.1 DETERMINANTS OF THE CURRENT ACCOUNT BALANCE

It has been very difficult to assess all of the factors jointly and compare their separate contributions to the pattern of current account balances; no single theoretical model can capture the entire range of theoretical and empirical relationships and there is no consensus for explanation about the pattern of current account dynamics. (Gruber and Kamin, 2007, p.2). As Chinn and Prasad (2003, p.48) affirm that "alternative theoretical models have different predictions about the factors determining current account balances and about the signs and magnitudes of the relationships between the current account fluctuations and these factors." Furthermore, determinants of the current account balance can vary from country to country since most of the countries have different characteristics, resources, economic structures and economic policies according to their different needs. Thus, characteristics of the economy being analyzed should be given more priority than standard econometric techniques to discover the determinants of the current account balance. In this respect, the factors that contribute to the current account balance of Turkey will be determined by comparing the Turkish economy with some other regions in the world, which are both have similarities and

differences with Turkey from different aspects. East Asian and Latin American Countries were selected for comparison since they are especially known as their persistent current account surpluses and deficits for last years respectively. In the figures below, there are average annual data about some macroeconomic variables for those regions which are expected to give insights about the structural similarities and differences between them.

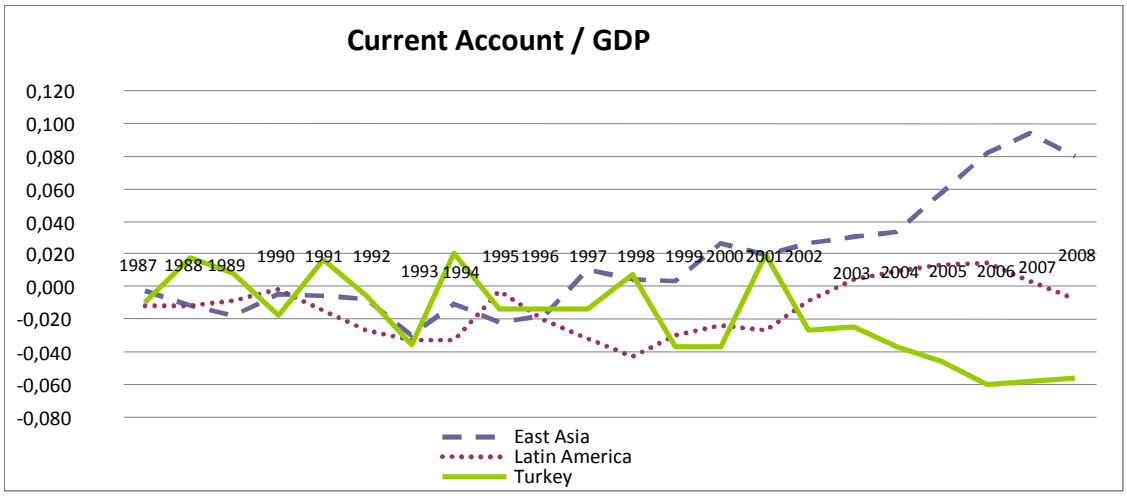

Figure 6.1: Current Account Balances of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

Since 1980s, Turkey has implemented extensive trade liberalization programs like most of the Latin American countries either voluntarily or under pressure from international economic institutions. The purpose was to improve macroeconomic performance, especially to reach high growth rates with a better balance of payments because neoclassical theory argues that opening up to international trade brings technology transfers and capital accumulation together with capital inflows which are seen as a source of rapid growth for developing countries. However, it can be much easier for imports to respond to lower trade barriers than for domestic producers to switch resources from producing for home market to exports. According to Economic Commission for Latin America and the Caribbean (ECLAC) framework; contrary to the developed countries, income elasticity of imports is higher than income elasticity of exports for most of the developing countries. Thirlwall and Hussain (1995) formalized this approach and applied it to a group of developing and developed countries to explain

the differences in growth and balance of payment statistics. Vos, Taylor and Barros (2002) proved this framework in their survey of balance of payment liberalization of some selected countries that higher import propensities offset the growth impacts of export expansion for nearly all countries. Thus, it can be claimed that East Asia's export lead growth strategies cannot be implemented in all economies. This was especially what happened in Turkey as we understand from the figures 6.2, 6.3 and 6.4. Together with growth, the imports have increased much more than the exports and trade balance has deteriorated which, then served as a constraint for growth. Hence, openness and growth may be appropriate candidates to explain the current account position of the Turkish economy.

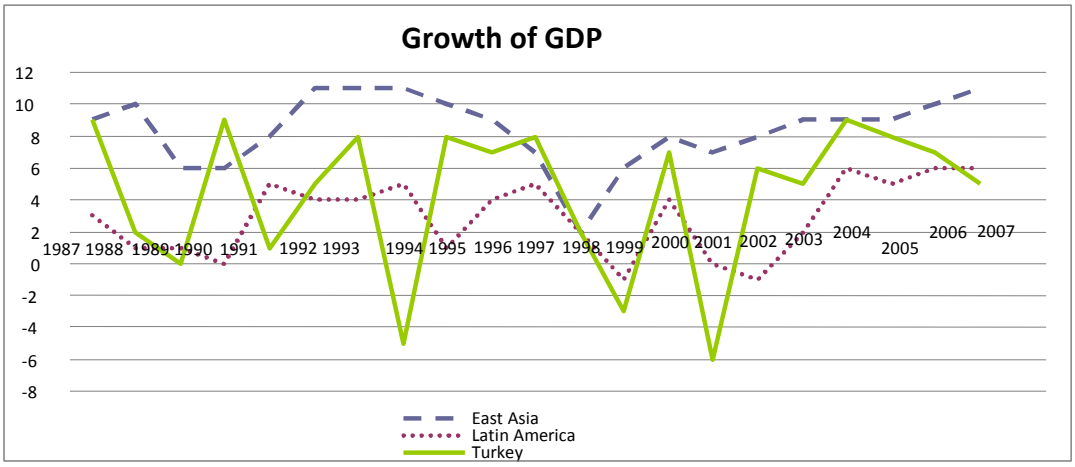

Figure 6.2: Growth rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

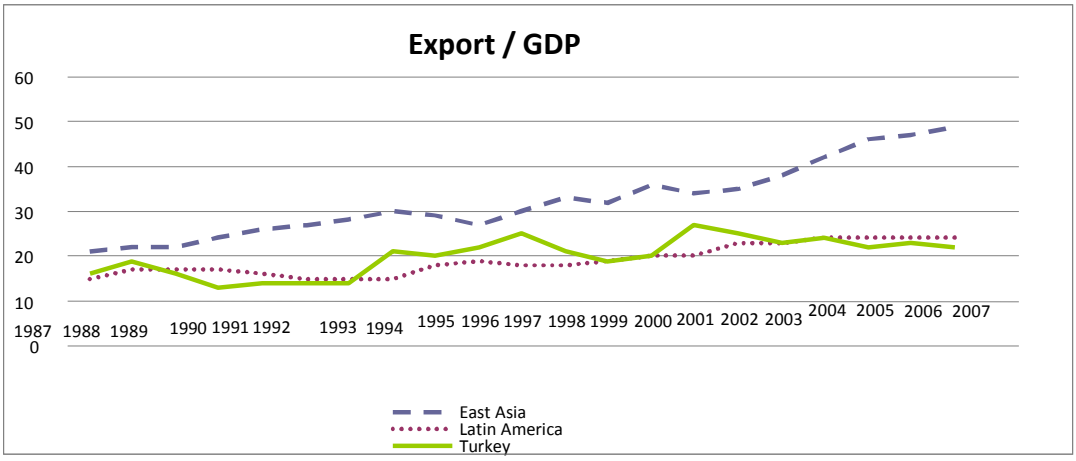

Figure 6.3: Export rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

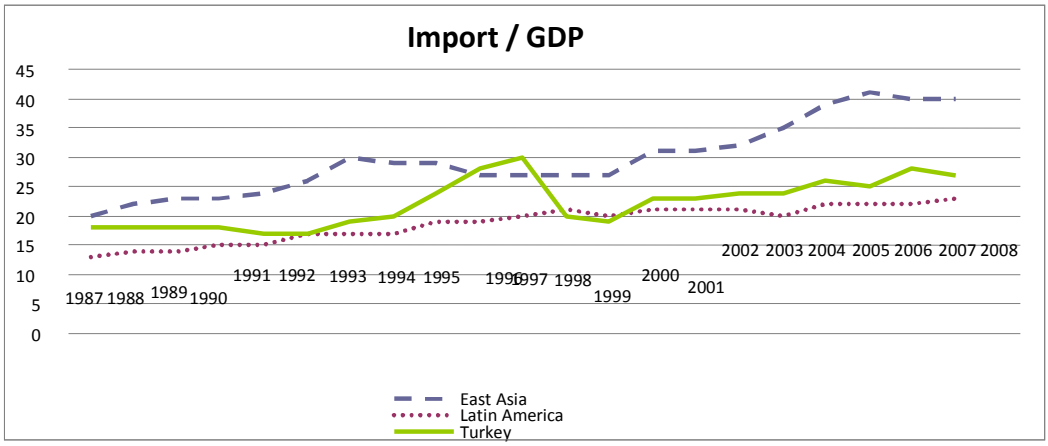

Figure 6.4: Import rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

A reasonable assumption of some development theories is that, given a certain level of technical progress and the way available resources are allocated, the higher the savings and investment rates, the higher the economic growth. However, given the developing countries' shortage of savings, foreign savings in the form of credit facilities and investments would be the excellent way of promoting such development. Thus, growth strategy offered to developing countries can be the growth with foreign savings and opening of the capital account strategy since it is seen as natural for capital rich countries to transfer their capital to capital poor countries and foreign savings received by a country will automatically be transformed into productive investment. As a result, a relatively appreciated level of real exchange rate and permanent current account deficits would be normal and advisable conditions for developing countries provided that they were sufficiently moderate, not leading to a balance of payment crises. Nevertheless, as Bresser-Pereira and Gala (2009) have found that, this policy and the resulting exchange rate overvaluation have exhibited that capital inflows could not mainly increase the investment but increased the consumption and foreign indebtedness in developing countries. Moreover, in case of the increase in the investment, if it is directed to the less productive sectors in which the return from that investment is lower than the cost of borrowing, or heavily to the nontradable sectors which do not induce foreign exchange revenue; it will be one of the major reasons impeding the country's

external debt repayments. As we can see from the figures 6.5, 6.6 and 6.7; Turkey is one of the representative countries about these findings like most of the Latin American countries. Whereas East Asian countries have used capital inflows mostly for investment in tradable sectors, in Turkey and Latin America those inflows and resulting exchange rate overvaluation have caused to increase in consumption (decrease in savings) and current account deficits. Ülengin and Yentürk (2001) have provided evidence for this argument in their analysis about the impact of foreign savings on aggregate spending categories in Turkey. High and persistent inflation also brought about increase in savings due to uncertain macroeconomic environment: it serves as a macroeconomic uncertainty and lack of monetary credibility. In such an environment, people do not make much investment and increase their saving through precautionary motive leading to a lower current account deficit. Hence, it can be concluded that investment and saving rates together with reel exchange rate and inflation rates can serve as determinants of the current account in Turkey.

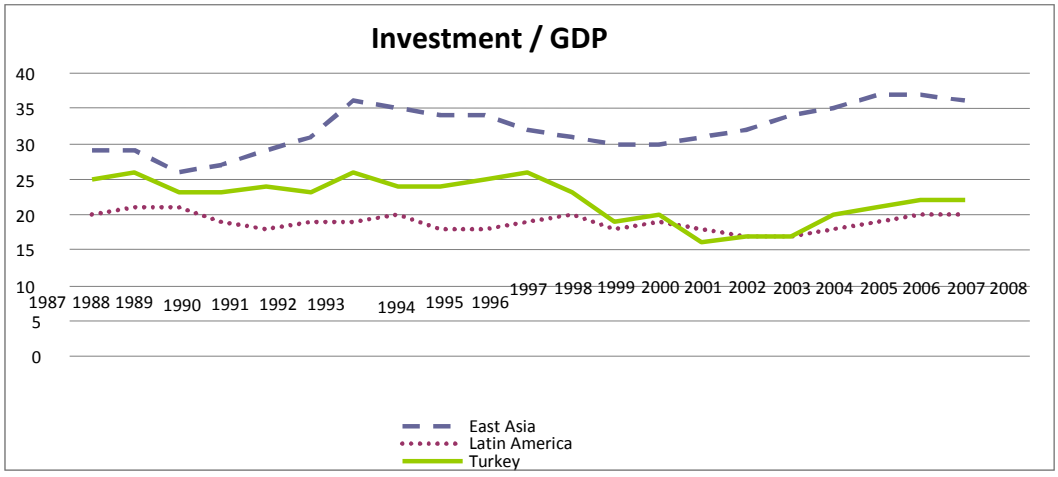

Figure 6.5: Investment rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

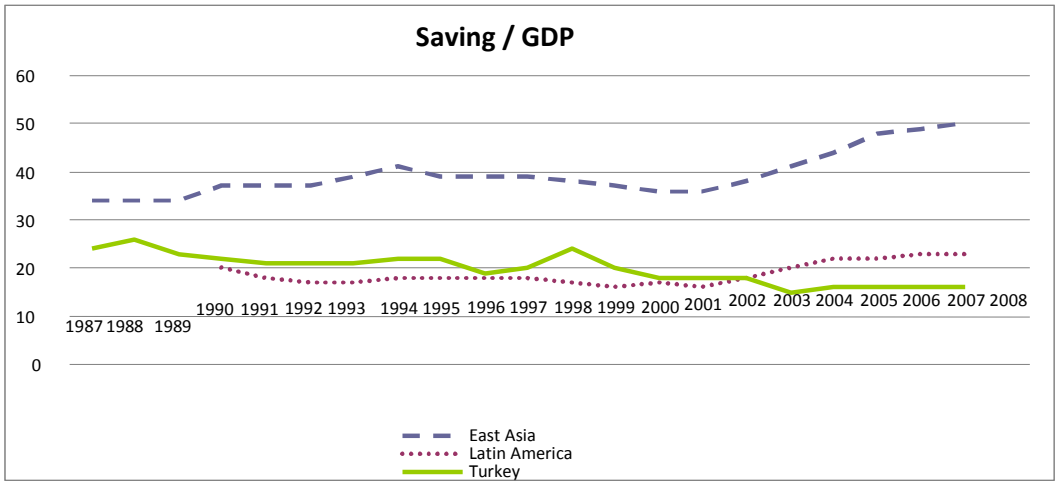

Figure 6.6: Saving rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

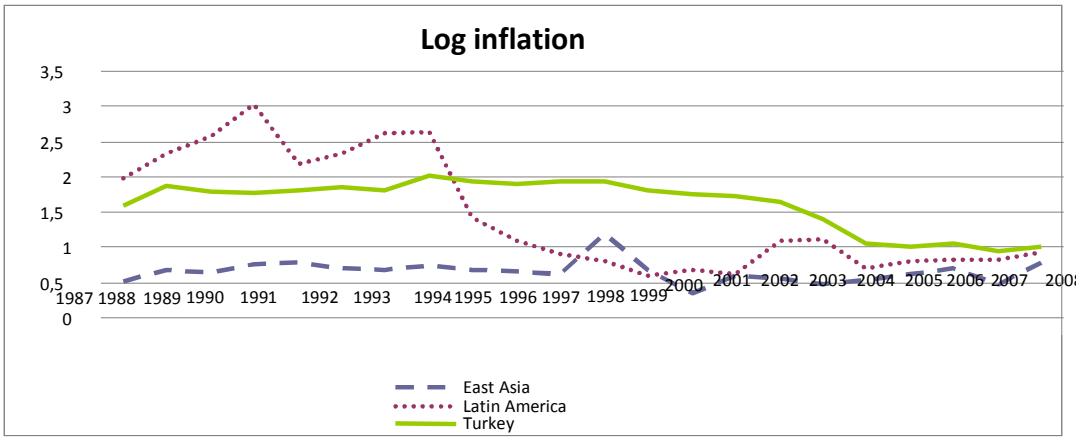

Figure 6.7: Inflation rates of Turkey and Other Regions
Source: World Bank; World Development Indicators and Global Development Finance

Turkey is an emerging country with a growing economy challenged by a growing demand for energy. Turkey's energy consumption has grown and will continue to grow along with its economy. Balat (2009) argues that more than 70 percent of energy use is imported since energy consumption is high, but domestic energy reserves and their production levels are low. Total primary energy production met only about one quarter of the total primary energy demand in recent years. Akçay and Üçer (2008) calculated interestingly that the average of the non-energy current account balance is almost zero for the last ten years. Since oil has the biggest share in total primary energy

consumption, oil prices can also be a good candidate for the determinant of a current account position of Turkey.

6.1.1 Vector Auto Regression Model

6.1.1.1 Data

Data are obtained from the Central Bank of the Republic of Turkey, Turkish Statistical Institute, Energy Information Administration and the World Bank. Turkish Lira values of all the variables are used. Variables in which the value are obtained as US Dollar are transformed to Turkish Lira by using the monthly averages of the Exchange rate of the Central Bank of the Republic of Turkey; which are Current Account and Oil prices. The frequency of the data is quarterly between 1987:4 and 2009:4. Since the observations (Obs.) for Gross Domestic Product is obtained only for each quarter in the period, other high frequency variables are transformed to the quarterly data. There are some summary statistics about the variables in the table below.

Table 6.1

Definition of the Variables

CA	Ratio of Current Account to GDP
GROWTH	Real Gross Domestic Product Growth Rate
INV	Ratio of Gross Capital Formation to GDP
SAV	Ratio of Saving to GDP
OPEN	Ratio of Exports and Imports to GDP
OIL	Growth of Brent Oil Prices in Europe
INF	Consumer Price Index Growth Rate (1978 based)
REER	Reel Effective Exchange Rate

Table 6.2

Descriptive Statistics for the Variables

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Obs.
CA	-0,024	-0,023	0,053	-0,125	0,040	-0,272	2,689	1,455	89
GROWTH	0,017	-0,048	0,352	-0,249	0,178	0,207	1,507	8,903	89
INV	0,222	0,225	0,284	0,121	0,037	-0,516	2,943	3,954	89
SAV	0,191	0,188	0,346	0,105	0,041	0,704	4,288	13,509	89
OPEN	0,513	0,529	0,816	0,258	0,148	-0,020	1,923	4,310	89

OIL	0,037	0,024	1,311	-0,589	0,216	2,091	15,627	656,156	89
INF	0,106	0,114	0,419	-0,013	0,075	0,768	4,819	21,016	89
REER	1,266	1,189	1,920	0,850	0,274	0,625	2,375	7,250	89

6.1.1.2 Methodology

In this part, Vector Auto Regression (VAR) setup is employed and Variance Decomposition results with Impulse Response analysis are used both to specify the determinants of the current account empirically, and decide whether empirical results support the theoretical findings in the former section about the current account behavior of Turkish Economy. The mathematical representation of a VAR model for any variable in the system is;

$$y_t = c + \alpha_{1i}\sum_{i=1}^{n} ca_{t-i} + \alpha_{2i}\sum_{i=1}^{n} growth_{t-i} + \alpha_{3i}\sum_{i=1}^{n} inv_{t-i} + \alpha_{4i}\sum_{i=1}^{n} sav_{t-i} + \alpha_{5i}\sum_{i=1}^{n} open_{t-i} + \alpha_{6i}\sum_{i=1}^{n} oil_{t-i} + \alpha_{7i}\sum_{i=1}^{n} inf_{t-i} + \alpha_{8i}\sum_{i=1}^{n} reer_{t-i} + \varepsilon_t \quad \text{(Eq. 25)}$$

where y_t is a vector of endogenous variables which are CA, GROWTH, INV, SAV, OPEN, OIL, INF and REER in our model, c is a vector of constant terms, α's are matrices of coefficients to be estimated, and ε_t is a vector of residual terms that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right-hand side variables.

6.1.1.3 Empirical Results

First, all of the level variables were adjusted seasonally with X12 additive method and seasonally adjusted components were used in the analyses. Then, the variables have been checked for stationarity by using Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), Dickey-Fuller Generalized Least Square (DF GLS) and Kwiatkowski-Phillips-Schmidt-Shin (KPSS) unit root tests. According to the test results; CA, GROWTH, OIL and INF are found stationary. INV, OPEN and REER could become stationary after taking their first differences, SAV could become stationary after detrended. Test Results are summarized in the below table:

Table 6.3

Unit Root Test Statistics for the Variables

	ADF		PP		DF GLS		KPSS	
	Trend and Intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
CA	-4.20***	-2.94**	-4.41***	-3.04**	-3.26**	-2.79***	0.15^{oo}	0.82^{ooo}
GROWTH	-11.6***	-11.6***	-11.6***	-11.6***	-10.6***	-10.1***	0.03	0.07
INV	-2.14	-2.06	-2.05	-2.10	-2.09	-1.14	0.13^{o}	0.45^{o}
SAV	-4.05**	-2.14	-3.90**	-2.20	-3.19**	-1.09	0.08	0.88^{ooo}
OPEN	-3.20*	-0.49	-3.04	-0.21	-2.68	0.23	0.07	1.12^{ooo}
OIL	-9.84***	-9.86***	-9.90***	-9.92***	-9.89***	-9.54***	0.03	0.08
INF	-3.61**	-2.17	-7.12***	-4.14***	-3.65***	-1.28	0.22^{ooo}	1.08^{ooo}
REER	-3.29*	-1.49	-3.29*	-1.36	-3.26**	-0.80	0.22^{ooo}	1.01^{ooo}
ΔINV	-7.95***	-7.98***	-7.97***	-8.01***	-7.15***	-5.60***	0.05	0.10
DT(SAV)	-5.73***	-5.77***	-5.71***	-5.75***	-5.21***	-3.24***	0.03	0.03
ΔOPEN	-7.25***	-7.11***	-9.40***	-9.19***	-8.56***	-7.74***	0.06	0.11
ΔREER	-10.3***	-10.3***	-11.0***	-11.0***	-10.3***	-10.1***	0.03	0.04

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% , 5% and 1% levels.
^{o} - ^{oo} and ^{ooo} denotes the rejection of the null hypothesis of stationary at 10% , 5% and 1% levels.
Δ denotes the first difference, DT denotes detrended.

After ensuring stationarity, the variables should be ordered in the VAR framework. Both theoretical relationships between the variables and the Granger Causality test results are used to determine the ordering of the variables. Granger Causality test results are summarized below table as only reporting the cases in which the causality is not rejected:

Table 6.4

Granger Causality Test Results (Summary)

OIL	⇒	CA
REER	⇒	CA
INF	⇒	CA
REER	⇒	GROWTH
INV	⇒	GROWTH
OPEN	⇒	INV
REER	⇒	INV
OPEN	⇒	SAV
GROWTH	⇒	SAV
REER	⇒	OPEN
INV	⇒	OPEN
OIL	⇒	OPEN
INV	⇒	OIL

OPEN	⇒	OIL
REER	⇒	INF
GROWTH	⇒	INF
SAV	⇒	REER

All of the variables are treated as endogenous and eventually the variables are ordered as: CA GROWTH INV SAV OPEN OIL INF REER

Then, optimal lag length is decided according to the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), Hannan-Quinn Information Criterion (HQ). FPE and AIC select the two as an optimal lag length whereas SC and HQ select one. Only LR selects four. Since some assumptions about the residual term like no serial correlation and constant variance are not satisfied for the 1 lag and 4 lag models, it was decided for the lag length to be 2. In the below table, lag length selection criteria and their calculated values are presented:

Table 6.5

VAR Lag Length Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	3.04e-23	-29.14	-28.91	-29.05
1	258.36	4.48e-24	-31.06	-28.98*	-30.22*
2	151.08	2.24e-24*	-31.79*	-27.86	-30.21
3	56.72	4.36e-24	-31.23	-25.44	-28.90
4	86.61*	4.51e-24	-31.41	-23.77	-28.33

* indicates lag order selected by that criterion

Estimated coefficient values in VAR models do not constitute the strength of these models. Better use of VAR models are made through variance decompositions and impulse response functions. Since our aim is to specify the variables which contribute to the current account balance, using these analyses will be more gainful. Variance Decomposition shows the proportion of the forecast error variance for each variable in the system that is attributable to innovations in itself and in other variables in the system. It can be seen from the analiysis clearly that there is a persistency in the current account and inflation is a most influential factor to determine the current account

balance: Current Account Balance is affected mostly from its own values and inflation rather than anything else. 40% and 26% of the forecast error variance of the current account in twentieth quarter is caused by innovations in its own past and inflation respectively. Current account balance is also influenced from the innovations in the growth, investment to GDP ratio, saving to GDP ratio, openness, oil prices, and reel exchange rate.

The effects of shocks to the system can be summarized by using impulse responses based on innovation accounting. The impulse response functions allow determining the signs of the effect of innovations in each variable on others. Therefore, it will complement the results in variance decompositions. Figure 6.8 shows the impulse response functions of the current account/GDP ratio from one standard deviation shock in each of the other variables. This figure shows how much the current account would change up to five years after the shock. The impact of the GDP growth rate, investment, oil prices and real exchange rate are negative on the current account balance whereas the impact of inflation and saving are positive as expected theoretically. Also, there is an evidence for the persistency in the current account. Only the effect of openness seems to be ambiguous. These results are supportive for the theoretical considerations made for the Turkish Economy and its current account balance position for the last decades.

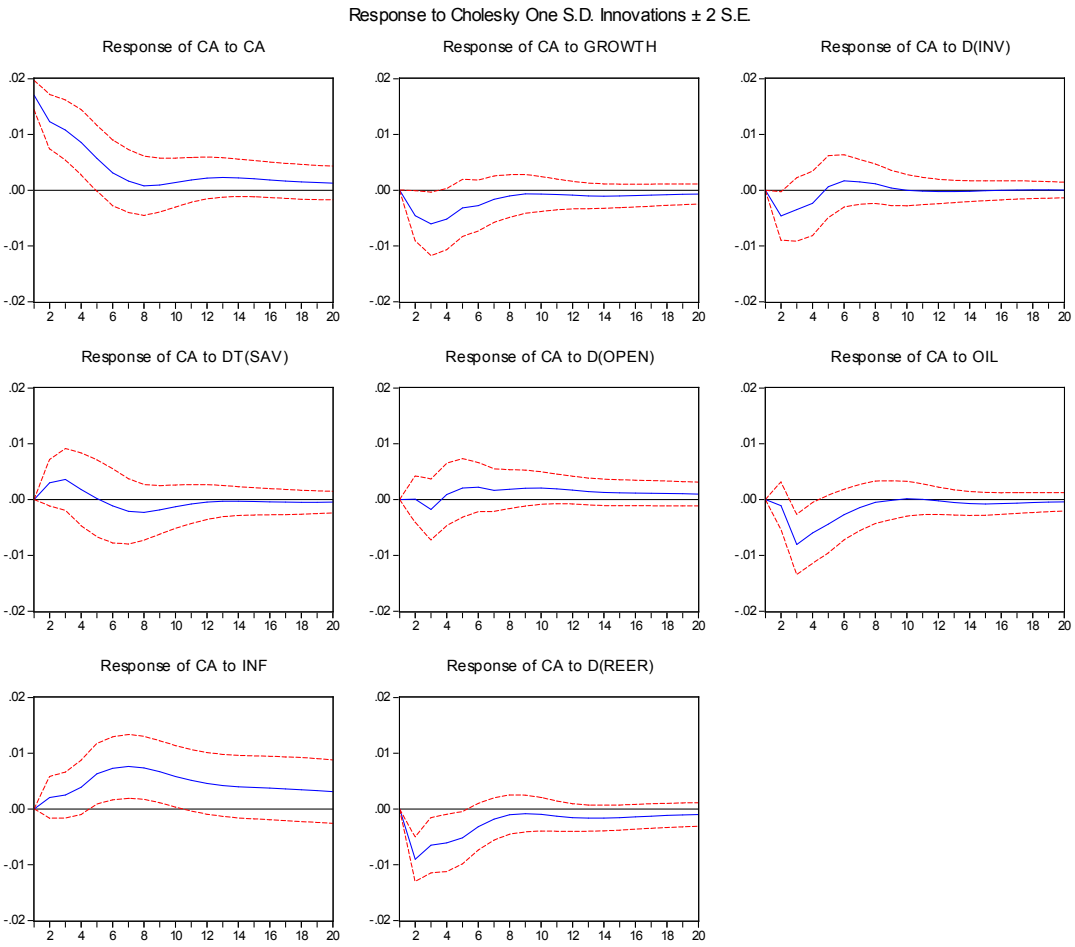

Figure 6.8: Response of Current Account Balance to Shocks in All Variables

6.1.1.4 Conclusion

Results confirm all the theoretical expectations; the impact of the GDP growth rate, investment, oil prices and real exchange rate are negative on the current account balance whereas the impact of inflation and saving are positive. Effects of growth, openness, oil prices and exchange rate seem weak and they diminish after at most eight periods; however the initial effects of saving and investment are reversed after four periods and present oscillating behavior.

Results of the Vector Auto Regression approach indicate that there is a persistency in the current account. Current account balance's appearance as a most

influential factor for itself explains the structural conditions of the Turkish Economy. Turkey imports particularly investment and intermediate goods while exporting final consumption goods. For the last decade in which the current account balance deteriorate mostly; 10 percent of Exports of Turkey was made up by investment goods, 44 percent was made up by intermediate goods and 46 percent was made up by consumption goods whereas 16 percent of Imports of Turkey was made up by investment goods, 73 percent was made up by intermediate goods and 11 percent was made up by consumption goods. Hence, current account deficit can be considered as a structural problem; exports largely depend on imported goods. Moreover, as the economy grows imports increase more than exports which results with current account deficit since the income elasticity of import is higher than the income elasticity of export for Turkey as a developing country.

Inflation seems the other factor that has most influence on the current account; it has considerable impacts on saving and investment. It affects saving positively and investment negatively by representing macroeconomic uncertainty which causes current account balance to improve. Investment, together with inflation, emerges as it has long lasting influence on the current account. It is an indicator for the sustainability of the deficits through increasing productive capacity and future income. Thus, while increasing investment causing the current account to deteriorate in the first place, it helps to recovery of the current account afterwards. However, as we see from the impulse response figure that recovery phase is not strong and stable as compared to the initial effect of deterioration. It can be explained by the investment attitude of the households and institutions in Turkey. Private sector prefers mostly the risky investment projects, because of the high interest rates it only invest in the projects that offer higher rate of return than the interest rates with high risk. Beside this, most of the government investments disregards profitability criteria and consider the voting potential of the investment sector or district. Hence, investment that is directed to the less productive or nontradable sectors cannot contribute much to the recovery of the current account balance in the long run.

Impact of growth is decreasing as the time passes especially for variance decomposition analysis. This behavior is an indicator that current account deficit is not a temporary but a permanent problem for Turkish Economy. Growth rate of the Gross Domestic Product shows oscillating behavior because of the crisis for the last decades. As the economy grows much in any period, households increase their consumption immediately since their disposable income is higher. However, as the time passes their perception about the growth turns to the temporary as they see that growth does not last so long and they smooth their consumption. This situation is somewhat similar for the effect of exchange rate and oil prices. They contribute to the determination of prices for tradable goods. Depreciation in the Turkish Lira or increase in the oil prices immediately increase the trade bill for predetermined imports and decrease the foreign exchange revenue which causes current account deficit. However, as the time passes decrease in the price of exports narrows current account deficit through stimulating exports and decreasing imports in volume.

6.1.2 ARDL Model

6.1.2.1 Data

Data are obtained from the Central Bank of the Republic of Turkey, Turkish Statistical Institute, Energy Information Administration and the World Bank. Turkish Lira values of all the variables are used. Variables in which the value are obtained as US Dollar are transformed to Turkish Lira by using the monthly averages of the Exchange rate of the Central Bank of the Republic of Turkey; which are Current Account and Oil prices. The frequency of the data is quarterly between 1987:4 and 2009:4. Since the Gross Domestic Product is obtained only for each quarter in the period, other high frequency variables are transformed to the quarterly data. Summary statistics about the variables had been presented in tables 6.1 and 6.2.

6.1.2.2 Methodology

In this part, Vector Error Correction (VEC) setup is employed and Auto Regressive Distributed Lag (ARDL) Bound Test Approach is used both to specify the determinants of the current account empirically, and decide whether empirical results

support the theoretical findings in the former section about the current account behavior of Turkish Economy. ARDL representation of the model is;

$$\Delta ca_t = c + \alpha_{1i}\sum_{i=1}^{n}\Delta ca_{t-i} + \alpha_{2i}\sum_{i=0}^{n}\Delta growth_{t-i} + \alpha_{3i}\sum_{i=0}^{n}\Delta inv_{t-i}$$

$$+\alpha_{4i}\sum_{i=0}^{n}\Delta sav_{t-i} + \alpha_{5i}\sum_{i=0}^{n}\Delta open_{t-i} + \alpha_{6i}\sum_{i=0}^{n}\Delta oil_{t-i} + \alpha_{7i}\sum_{i=0}^{n}\Delta inf_{t-i} \quad \text{(Eq. 26)}$$

$$+\alpha_{8i}\sum_{i=0}^{n}\Delta reer_{t-i} + \lambda_1(ca_{t-1} - \beta_1 growth_{t-1} - \beta_2 inv_{t-1} - \beta_3 sav_{t-1}$$

$$-\beta_4 open_{t-1} - \beta_5 oil_{t-1} - \beta_6 inf_{t-1} - \beta_7 reer_{t-1}) + \varepsilon_t$$

This representation allows us to analyze both the long run equilibrium and the short run adjustment phase. It starts with conventional unit root tests and continues with Johansen (1988) cointegration test if all the variables are integrated of same order. However, as it can be seen from the above results that the variables in the empirical analysis are not integrated of same order. CA, GROWTH, OIL and INF are Integrated of order zero (I(0)) whereas SAV, INV, OPEN and REER are Integrated of order one (I(1)). Since it would be misleading to employ the Johansen cointegration test in this case, autoregressive distributed lag bound test was used which was proposed by Pesaran, Smith, and Shin (2001). The choice of this test is based on the following considerations. First, unlike most of the conventional multivariate cointegration procedures, which are valid for large sample size, the bound test is suitable for a small sample size study. Second, the bound test does not impose restrictive assumptions that all the variables under study must be integrated of the same order. Its asymptotic distribution for the F statistic is non-standard under the null hypothesis of no cointegration relationship between the examined variables, irrespective whether the explanatory variables are purely I(0) or I(1), or mutually cointegrated. Hence, the order of integration is no more a sensitive issue and estimation can continue without performing the unit root tests. As the error correction term in the ARDL does not have restricted error corrections, actually the ARDL is an Unrestricted Error Correction Model:

$$\Delta ca_t = c + \alpha_{1i}\sum_{i=1}^{n}\Delta ca_{t-i} + \alpha_{2i}\sum_{i=0}^{n}\Delta growth_{t-i} + \alpha_{3i}\sum_{i=0}^{n}\Delta inv_{t-i}$$

$$+\alpha_{4i}\sum_{i=0}^{n}\Delta sav_{t-i} + \alpha_{5i}\sum_{i=0}^{n}\Delta open_{t-i} + \alpha_{6i}\sum_{i=0}^{n}\Delta oil_{t-i} + \alpha_{7i}\sum_{i=0}^{n}\Delta inf_{t-i} \quad \text{(Eq. 27)}$$

$$+ \alpha_{8i}\sum_{i=0}^{n}\Delta reer_{t-i} + \gamma_1 ca_{t-1} + \gamma_2 growth_{t-1} + \gamma_3 inv_{t-1} + \gamma_4 sav_{t-1}$$

$$+ \gamma_5 open_{t-1} + \gamma_6 oil_{t-1} + \gamma_7 inf_{t-1} + \gamma_8 reer_{t-1} + \varepsilon_t$$

The bound test is a Wald Test (or F test) in which the joint significance of α coefficients for lagged variables is tested with F statistics calculated under the null. The distribution of the test statistics under the null is non-standard, in which critical values depend on the order of integration of variables involved. Thus, rather than using standard critical F statistic values, The upper (for I(1)) and lower (for I(0)) bounds of the F statistics presented by Peseran et. al. (2001) are used. For a given significance level of α's , if the F statistic falls outside the critical bound, a conclusive inference can be made without considering the order of integration of the underlying regressors. If the F-statistic is lower (higher) than the lower (upper) critical bound, then the null hypothesis of no cointegration is accepted (rejected). In cases where the F statistic falls inside the lower and upper bounds, a conclusive inference cannot be made.

6.1.2.3 Empirical Results

As a first step in ARDL model, below hypothesis was tested for equation 27:

$H_0 : \gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5 = \gamma_6 = \gamma_7 = \gamma_8 = 0$
$H_1 : H_0$ is not true

Table 6.6

Results for the Bound Test for Cointegration

k	N	F statistic	Upper (%1)	Lower (%1)	Upper (%5)	Lower (%5)	Decision
1	7	5.76	2.96	4.26	2.32	3.50	Cointegration

k is the lag length, n is the number of variables in the equation other than lags of dependent variable

Test for the cointegration by using equation 27 requires deciding the optimal lag length first. SIC and HQ select the optimal lag length as one although AIC selects five, also there is no autocorrelation in the residual term for the first four lags. Hence, optimal lag length was selected as one. Results of the test according to 1 lag model are given by the above table. The Hypothesis of no long run relationship is rejected with both 5 percent and 1 percent significance levels since the F statistic is above the upper bound levels.

After ensuring the cointegration between the series, next step is to determine the optimal lag length for ARDL model. According to Akaike Information Criteria, the lag lengths of the model for long run equilibrium were determined as ARDL (5,2,3,0,0,2,0,2).

$$\mathrm{ca}_t = \mathrm{c} + \alpha_{1\mathrm{i}} \sum_{i=1}^{5} ca_{t-i} + \alpha_{2\mathrm{i}} \sum_{i=0}^{2} growth_{t-i} + \alpha_{3\mathrm{i}} \sum_{i=0}^{3} inv_{t-i} + \alpha_{4\mathrm{i}} \sum_{i=0}^{0} sav_{t-i}$$
$$+\alpha_{5\mathrm{i}} \sum_{i=0}^{0} open_{t-i} + \alpha_{6\mathrm{i}} \sum_{i=0}^{2} oil_{t-i} + \alpha_{7\mathrm{i}} \sum_{i=0}^{0} inf_{t-i} + \alpha_{8\mathrm{i}} \sum_{i=0}^{2} reer_{t-i} + \varepsilon_t \quad \text{(Eq. 28)}$$

Resulting long run relationship is obtained from the estimation of equation 28 with Ordinary Least Square (OLS) as;

$$ca = -0,301 growth - 0,223 inv - 0,005 sav$$
$$-0,035 open - 0,034 oil + 0,185 \mathrm{inf} - 0,049 reer \quad \text{(Eq. 29)}$$

The impact of the GDP growth rate, investment, openness, oil prices and real exchange rate are negative on the current account balance whereas the impact of inflation is positive as expected theoretically. However, the impacts of saving is not in line with theoretical arguments.

Then, short run relationships were estimated by OLS with below equation. ARDL (2,0,1,0,0,1,3,2) specification is used in which Akaike Information Criterion is minimized.

$$\Delta ca_t = c + \alpha_{1i} \sum_{i=1}^{2} \Delta ca_{t-i} + \alpha_{2i} \sum_{i=0}^{0} \Delta growth_{t-i} + \alpha_{3i} \sum_{i=0}^{1} \Delta inv_{t-i}$$

$$+ \alpha_{4i} \sum_{i=0}^{0} \Delta sav_{t-i} + \alpha_{5i} \sum_{i=0}^{0} \Delta open_{t-i} + \alpha_{6i} \sum_{i=0}^{1} \Delta oil_{t-i} \qquad \text{(Eq. 30)}$$

$$+ \alpha_{7i} \sum_{i=0}^{3} \Delta inf_{t-i} + \alpha_{8i} \sum_{i=0}^{2} \Delta reer_{t-i} + \lambda_1 ECT_{t-1} + \varepsilon_t$$

As the results indicates, when the current account balance deviates from its long run equilibrium level as a response of any shock in the explaining variables, it turns to the equilibrium level quite fast. The coefficient (λ_1) of the Error Correction Term (ECT_{t-1}) is -0,231, that is obtained from the relationship found above, means that after any shock, it takes 4 periods for current account balance to turn back its long run equilibrium level.

6.1.2.4 Conclusion

Results of the ARDL model are supportive for the Vector Auto Regression approach, but little bit confusing for the theoretical arguments. Impacts of growth, inflation and investment are higher than the other variables as in the VAR framework together with the effects of saving, openness, oil prices and real exchange rate are not significant and so small in magnitude that saving can be considered as negligible. Nevertheless, effect of saving on the current account balance seems to conflict with the theory as being negative in this framework. According to the estimates; when the growth rate of the economy increase 10 percent, current account deficit to GDP ratio increases 3 percent, when the investment rate increase 10 percent, current account deficit to GDP ratio increases 2,2 percent, when the saving rate increase 10 percent, current account deficit to GDP ratio increases 0,05 percent when the openness rate increase 10 percent, current account deficit to GDP ratio increases 0,35 percent, when the oil prices increase 10 percent, current account deficit to GDP ratio increases 0,34 percent, when the inflation rate increase 10 percent, current account deficit to GDP ratio decreases 1,8 percent and when the real exchange rate increase 10 percent, current account deficit to GDP ratio increases 0,49 percent. Evaluation of the coefficient of the

Error Correction Term gives insights about the speed of adjustment mechanism; -0,231 means that any deviation in the current account balance is eliminated almost in a year.

Results about the impact of investment on the current account in the long run equation supports the conclusions of the VAR model and justify the theoretical evaluations made about that conclusions. It had been argued that increase in the investment worsens the current account in the first instance but if the investment is directed to the most profitable and tradable sectors it may improve the current account balance in the future. Coefficient of the long run relationship between investment and current account balance demonstrates once more that investment decisions in Turkey are not made according to the profitability or sustainability criteria and far from being rational.

Growth is another most influential negative factor on the current account balance in the long run in addition to the investment. This result validates the conclusions of the VAR model about the structural condition of the Turkish Economy that exports depend on imports and also reveals another feature of the economy that growth depends on imports. At the end of 1980s, when the policy of decreasing costs by wages to obtain comparative advantage comes to an end, together with high tax rates in all categories of production, import emerges as a way of decreasing costs since most of the intermediate product can be imported cheaper than domestic production. While imports are growing faster than GDP, share of industrial production in GDP decreases especially for the last decade. As the imports substitute domestic production, growth became highly dependent on imports. Hence, Turkish Economy has to endure the current account deficits due to imports in order to grow.

Inflation emerges as the only factor that influences current account positively; it has significant impacts on both saving and investment decisions made by households and firms. As the analyzing period for the Turkish economy is known as high and persistent inflation rates, this considerable effect of inflation is not surprising since people make investment and saving decisions according to the expected high and long lasting inflation rates.

Impact of openness on the current account balance seems to be limited. However, openness rate of the Turkish Economy rise sharply in the period of our analysis while the country is having large current account deficits. This may look as a contradiction but it can be argued that openness affects the current account only indirectly. Openness is defined as the totality of import and export rates to the GDP. Only one part of the increase in the openness rate deteriorates the current account; imports. It affects current account negatively by the difference in the growth rates of the imports and exports. Even though increase in the imports rate is more than the exports, the difference between them may not enough for openness to worsen the current account balance. Oil prices and real exchange rate have common feature that both of them contributes to the price formation of tradable goods. As the prices can be considered important for the time of trade is realized, they do not seem to have long term effectiveness on the current account.

6.2 SUSTAINABILITY OF THE CURRENT ACCOUNT DEFICIT

The current account balance and its sustainability are important parameters to both policymakers and investors since they measure both the economic performance of a country and change in its national net indebtedness. Large and persistent current account deficits are often assumed to play an important role in the dissemination of currency crises and are considered as an early warning indicator (Zanghieri, 2004). The currency crises in the Chile, Mexico, and Argentina are often associated with large and persistent current account deficits. Edwards (2001) provides empirical evidence that probability of a country experiencing currency crisis increase with large current account deficits. However, external imbalances need not to be end up with currency crisis. Kaminsky, Lizondo and Reinhart (1998) outline that in various studies carried out to explain financial crises; there is no single best indicator and a large number of explanatory indicators are used in the prediction of potential financial crisis.

A country will be able to sustain its current account deficit as long as it can find external borrowing. Although this can be feasible in the short run, the ability of the country to service its debt by referring to further borrowing is likely to be questioned once the deficit become persistent. As Hakkio (1995) states, temporary current account

deficits present fewer problems as the imbalances represent the natural outcome of reallocating capital to the country that the factor of production tends to receive the highest possible returns. However, large and persistent current account deficits tend to cause more serious problems for a country and may require a policy response. “They are causes for both domestic and international concern because of undesirable consequences of a forced adjustment in the economic policies if such deficits are expected to continue.” (Baharumshah, 2003, p.466). As Wu (2000) claims, sustaining an increasing current account deficit implies measures such as increasing domestic interest rates relative to foreign to attract more foreign capital for financing the deficit. This imposes an excessive burden on future generations as the accumulation of larger debt will imply increasing interest payments and thus a lower standard of living. Hence, instead of emphasizing the current account deficits of a country at any particular point in time, economists are more concerned with its sustainability through the country’s intertemporal solvency constraint.

6.2.1 Solvency of Debt

6.2.1.1 Data

Data are obtained from the Central Bank of the Republic of Turkey and Turkish Statistical Institute. Turkish Lira values of all the variables are used. Variables in which the values are obtained as US Dollar are transformed to Turkish Lira by using the monthly averages of the Exchange rate of the Central Bank of the Republic of Turkey; which are Exports and Imports. The frequency of the data is quarterly between 1992:1 and 2009:4. Since the Gross National Product is obtained only for each quarter in the period, other high frequency variables are transformed to the quarterly data. There are some summary statistics about the variables in the table below.

Table 6.7

Definition of the Variables

EXP	Ratio of Exports to GDP
IMP	Ratio of Imports to GDP
EXPORT	Exports (billion US dollar)
IMPORT	Imports (billion US Dollar)
INTEREST	Net interest payments (billion US dollar)
TRANSFER	Net transfer payments (billion US dollar)

Table 6.8

Descriptive Statistics for the Variables

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Obs.
EXP	0.191	0.195	0.328	0.063	0.063	-0.061	2.185	2.035	72
IMP	0.261	0.260	0.444	0.116	0.080	0.088	2.073	2.666	72
EXPORT	13067	8590	38990	3303	9406	1.099	3.145	14.35	72
IMPORT	-17969	-11652	-4637	-55171	12912	-1.211	3.484	18.06	72
INTEREST	-919	-890	-476	-1989	324	-0.906	3.658	11.01	72
TRANSFER	780	781	1641	197	368	0.234	2.056	3.281	72

6.2.1.2 Methodology

Husted (1992) developed a theoretical framework to test for sustainability of current account based on the long run relationship between the exports and imports by adopting Hakkio and Rush's (1991) procedure for the fiscal sustainability.

The model starts with a representative consumer who lives in a small open economy that produces and exports a single composite good and has no government. The agent is able to borrow and lend in international markets using one-period financial instruments, faces a given world rate of interest, and is assumed to maximize lifetime utility subject to budget constraints. The agent's resources are composed of endowments of output and redistributed profits from firms. These resources are used for consumption and savings. The budget constraint of this individual in any period is given by;

$$C_t = Y_t + B_t - I_t - (1 + r_t)B_{t-1} \qquad \text{(Eq. 31)}$$

where C_t denotes current consumption; Y_t is output; I_t is investment; r_t is the world interest rate; B_t is international borrowing, which could be positive or negative; and $(1+r)B_{t-1}$ is the initial debt of the representative household, corresponding to the country's external debt. Since equation must hold for every time period, by defining the trade balance as the difference between the exports and the imports;

$$TB_t = Y_t - C_t - I_t = X_t - M_t \quad \text{(Eq. 32)}$$

All periods budget constraints can be added up to form the economy's intertemporal budget constraint;

$$B_{t+1} = -TB_{t+1} + (1+r_{t+1})B_t \quad \text{(Eq.33)}$$

$$B_{t+2} = -TB_{t+2} + (1+r_{t+2})B_{t+1} = -TB_{t+2} - (1+r_{t+2})TB_{t+1} + (1+r_{t+2})(1+r_{t+1})B_t \quad \text{(Eq. 34)}$$

……..

$$B_{t+n} = -TB_{t+n} - (1+r_{t+n})TB_{t+n-1} - \ldots\ldots\ldots - (1+r_{t+n})(1+r_{t+n-1})\ldots\ldots(1+r_{t+2})TB_{t+1} + (1+r_{t+n})(1+r_{t+n-1})\ldots\ldots(1+r_{t+1})B_t \quad \text{(Eq. 35)}$$

Rearranging the last equation for B_t, we obtain the intertemporal budget constraint of the representative agent for n approaches to infinity. Namely

$$B_t = \sum_{i=1}^{\infty} \mu_i TB_{t+i} + \lim_{n\to\infty} \mu_n B_{t+n} \quad \text{(Eq. 36)}$$

μ is discount factor which is $\mu_i = \prod_{s=1}^{i} \beta_s$ and $\beta_s = \frac{1}{1+r_{t+s}}$

Equation (36) states that net international borrowing of the economy in period *t* is equal to the present value of all its future trade balances providing that the second term on the right hand side is zero. Assuming the world interest rate is stationary with unconditional mean r, equation (32) can be expressed as;

$$X_t - M_t = Y_t - C_t - I_t = -B_t + (1+r_t)B_{t-1} \quad \text{(Eq. 37)}$$

$$M_t + (1+r_t)B_{t-1} = X_t + B_t \quad \text{(Eq. 38)}$$

$$M_t + (r_t - r)B_{t-1} + (1+r)B_{t-1} = X_t + B_t \quad \text{(Eq. 39)}$$

Rearranging this equation for B_t and defining the

$$Z_t = M_t + (r_t - r)B_{t-1} \qquad \text{(Eq. 40)}$$

we obtain

$$B_t = Z_t - X_t + (1+r)B_{t-1} \qquad \text{(Eq. 41)}$$

$$B_{t+1} = Z_{t+1} - X_{t+1} + (1+r)B_t = Z_{t+1} - X_{t+1} + (1+r)[Z_t - X_t + (1+r)B_{t-1}] \qquad \text{(Eq. 42)}$$

.....

$$B_{t+n} = \sum_{j=o}^{n} (1+r)^{n-j} \left(Z_{t+j} - X_{t+j} \right) + (1+r)^{n+1} B_{t-1} \qquad \text{(Eq. 43)}$$

when *n* approaches to infinity, we can obtain B_{t-1} as;

$$B_{t-1} = \sum_{j=o}^{\infty} \left(\frac{1}{1+r} \right)^{j+1} \left(X_{t+j} - Z_{t+j} \right) + \lim_{n\to\infty} \left(\frac{1}{1+r} \right)^{n+1} B_{t+n} \qquad \text{(Eq. 44)}$$

then, defining $\mu = \frac{1}{1+r}$;

$$B_{t-1} = \sum_{j=o}^{\infty} \mu^{j+1} \left(X_{t+j} - Z_{t+j} \right) + \lim_{n\to\infty} \mu^{n+1} B_{t+n}$$

$$= \mu(X_t - Z_t) + \mu \sum_{j=1}^{\infty} \mu^j \left(\Delta X_{t+j} - \Delta Z_{t+j} \right) + \mu \sum_{j=1}^{\infty} \mu^{j+1} \left(X_{t+j} - Z_{t+j} \right)$$

$$+ ..... + \lim_{n\to\infty} \mu^{n+1} B_{t+n} \qquad \text{(Eq. 45)}$$

$$= \mu(X_t - Z_t) + \mu \sum_{j=1}^{\infty} \mu^j \left(\Delta X_{t+j} - \Delta Z_{t+j} \right) + \mu B_{t-1} + (1-\mu) \lim_{n\to\infty} \mu^{n+1} B_{t+n}$$

adding B_t terms in the left hand side we obtain;

$$\frac{1-\mu}{\mu} B_{t-1} = X_t - Z_t + \sum_{j=1}^{\infty} (\mu)^j \left(\Delta X_{t+j} - \Delta Z_{t+j}\right) + \frac{1-\mu}{\mu} \lim_{n\to\infty} (\mu)^{n+1} B_{t+n} \quad \text{(Eq. 46)}$$

which equals to;

$$Z_t + r_t B_{t-1} = X_t + \sum_{j=1}^{\infty} (\mu)^j \left(\Delta X_{t+j} - \Delta Z_{t+j}\right) + r \lim_{n\to\infty} (\mu)^{n+1} B_{t+n} \quad \text{(Eq. 47)}$$

Subtracting X_t from both side of equation and multiplying by (-1), left hand side of equation becomes the current account of an economy. Furthermore, by assuming the limit term that appears in equation is zero, X_t and Z_t follow random walk with drift and adding the residual term, the following regression model can be obtained;

$$X_t = \alpha + \beta MM_t + \varepsilon_t \quad \text{(Eq. 48)}$$

where $$MM_t = M_t + r_t B_{t-1} \quad \text{(Eq. 49)}$$

measures imports of goods and services plus net interest payments plus net unilateral transfers. The necessary condition (weak form) for the economy to satisfy its intertemporal budget constraint is the existence of a stationary error structure, that is, ϵ_t in equation should be an I(0) process. On the other hand, failure to detect co-movements between exports (inflows) and imports (outflows) would indicate the economy fails to satisfy its budget constraint, and therefore, is expected to default on its debt (Hakkio and Rush, 1991). Hence, such a finding provides evidence against the sustainability of the current account balance. One can then use this criterion to search for the sustainability of the current account deficit.

The necessary and sufficient condition (strong form) for the intertemporal budget constraint model is the existence of a vector (α,β) such that ϵ_t is a stationary process and $(\alpha,\beta) = (0,1)$. In other words, if exports and imports are cointegrated with cointegrating vector b = (1,-1), then the economy is said to satisfy its strong form of the intertemporal budget constraint in the long run. Such a relationship would imply that the two series would never drift too far apart. Equation above provides a useful framework for testing the sustainability of current account deficits.

6.2.1.3 Empirical Results

In the empirical work; first, variables have been checked for stationarity by using Augmented Dickey-Fuller, Phillips-Perron, Dickey-Fuller Generalized Least Square and Kwiatkowski-Phillips-Schmidt-Shin unit root tests. According to the test results; both EXP and IMP are found trend-stationary. They could become stationary after making them detrended with HP filter. Test Results are summarized in the below table:

Table 6.9

Unit Root Test Statistics for Variables

	ADF		PP		DF GLS		KPSS	
	Trend and Intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
EXP	-4.39***	-1.30	-4.83***	-1.63	-4.35***	-0.13	0.05	1.03°°°
IMP	-3.76**	-1.29	-5.32***	-1.71	-3.80***	-0.11	0.08	1.06°°°
	None	Intercept	None	Intercept	-	Intercept		
DT(EXP)	-4.02***	-4.02***	-5.24***	-5.20***	-	-3.16***	0.05	0.05
DT(IMP)	-4.70***	-4.76***	-5.83***	-5.78***	-	-4.75***	0.06	0.06

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% , 5% and 1% levels.
° - °° and °°° denotes the rejection of the null hypothesis of stationary at 10% , 5% and 1% levels.
DT denotes detrended.

Then, optimal lag length is decided according to the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), Hannan-Quinn Information Criterion (HQ). All criteria except SC select five as an optimal lag. In the below table, Lag length selection criteria and their calculated values are presented:

Table 6.10

VAR Lag Length Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	3.76e-07	-9.119	-9.051	-9.092
1	24.10	2.87e-07	-9.389	-9.186*	-9.309
2	11.36	2.68e-07	-9.456	-9.119	-9.324
3	15.95	2.30e-07	-9.611	-9.139	-9.425
4	10.68	2.15e-07	-9.680	-9.073	-9.441
5	12.18*	1.94e-07*	-9.785*	-9.043	-9.493*
6	1.326	2.15e-07	-9.686	-8.809	-9.341
7	6.648	2.14e-07	-9.697	-8.685	-9.298
8	3.424	2.28e-07	-9.645	-8.498	-9.193

* indicates lag order selected by that criterion

Then, cointegration relation between exports and imports was searched by the cointegration test with 5 lag of each variables;

Table 6.11

Johansen Cointegration Test

No. of CE vectors	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability
None	0.1406	10.446	15.394	0.247
At most 1	0.0067	0.4460	3.8414	0.504
No. of CE vectors	Eigenvalue	Max Eigen Statistic	0.05 Critical Value	Probability
None	0.1406	10.0003	14.264	0.211
At most 1	0.0067	0.4460	3.8414	0.504

Estimated equation for ($X_t = \alpha + \beta MM_t + \varepsilon_t$) by Dynamic OLS is;

$$EXP_t = \underset{(0,009)}{0,001} + \underset{(0,034)}{0,729}\ IMP_t \qquad \text{(Eq. 50)}$$

Table 6.12

Engle and Granger Cointegration Test

	ADF		PP		DF GLS
	None	Intercept	None	Intercept	Intercept
RESIDUALS	-4.17***	-4.14***	-4.25***	-4.22***	-4.03***

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% - 5% and 1% levels.
Residuals obtained from Cointegration Equation (Eq. 50).

Wald Test result for the hypothesis of $\alpha = 0$ and $\beta = 1$ is F = 350.66 and prob.= 0

Conventional unit root tests that are presented above do not consider the structural breaks. However, there are strong arguments and discussions in the literature that there may be a change in the mean and/or trend of the series that affects the order of integration in the presence of structural changes. Perron (1989) argues that, conventional unit root tests are biased towards accepting the null hypothesis in the presence of structural breaks which means accepting that series have a unit root although they are stationary. As this work contain the years between 1992 and 2009 which are known as the period of crises and fundamental structural changes, unit root and cointegration tests that take structural breaks into consideration should be used. For this reason, Zivot – Andrews (1992) unit root test with Gregory –Hansen (1996) Cointegration tests were performed to determine the stationarity of the series and cointegration relationship between them respectively.

Time of structural break is endogenously determined in Zivot – Andrews' unit root test. It has three different versions; break in the mean, break in the slope, break both in the mean and the slope. As a general to specific model selection; first the model that has break in the mean and the slope is estimated and checked the significance of the mean and slope dummies. If both of them are significant, this model is used. If only one of them is significant, then the model which uses that significant dummy is selected. If none of them are significant, then it is decided that there is no structural break in the series. In the empirical work for the EXP and IMP series, both the mean and the slope dummies were found to be significant and it was decided to use general model below;

$$\Delta y_t = \alpha_1 + \alpha_2 DU_t(\lambda) + \beta_1 t + \beta_2 DT_t(\lambda) + \theta y_{t-1} + \sum_{i=1}^{n} \gamma_i \Delta y_{t-i} + \varepsilon_t \qquad \text{(Eq. 51)}$$

where

$$DU_t(\lambda) = \begin{cases} 1 & \text{if } t > Tb \\ 0 & otherwise \end{cases}$$

$$DT_t(\lambda) = \begin{cases} t - Tb & \text{if } t > Tb \\ 0 & otherwise \end{cases}$$

In above test equation; Tb refers to the year that possible structural break occurs and λ refers to the relative break time in the data period. This equation was estimated for all possible break years and the equation in which the θ coefficient has highest t statistic was selected as break year. Since the results in Zivot – Andrews test

are very sensitive to the number of lag, in every equation, the number of lag was determined separately according to the Akaike Information Criterion. Then, this t – statistic was used to determine if the series are stationary. Results are presented in table 6.13 below:

Table 6.13

Zivot – Andrews Unit Root Test Statistics for Variables

	α_1	A_2	β_1	β_2	θ	t-stat (θ)	Break time	Lag
EXP	0.093	0.018	0.0009	0.0008	-0.752	-4.718	2001:1	8
IMP	0.139	-0.078	0.007	-0.001	-0.305	-4.418	1998:2	4

Critical values for unit root test are -5,57 (1%), -5,08 (5%) and -4,82 (10%) from table 4 in Zivot - Andrews (1992)

According to the above results, it was concluded that Export to GDP ratio has a structural break in the first quarter of 2001 and Import to GDP ratio has a structural break in the second quarter of 1998. Since the t statistics of the θ coefficients are lower than the critical values in an absolute manner, the null hypothesis of unit root was accepted for both EXP and IMP.

After ensuring that series have a unit root, Gregory – Hansen (1996) cointegration test was performed to search for a long term relationship between exports and imports. This test assumes that the parameters in the possible cointegration relation are not stable over time because of the structural breaks. Time of structural break is also endogenously determined in the test. The test was performed by estimating the below equation with OLS;

$$EXP_t = \alpha_1 + \alpha_2\phi_{tb} + \beta_1 IMP_t + \beta_2 IMP_t\phi_{tb} + \varepsilon_t \qquad \text{(Eq. 52)}$$

$$\text{where } \phi_{tb} = \begin{cases} 1 & \text{if } t > tb \\ 0 & otherwise \end{cases}$$

In above test equation, tb refers to the year that possible structural break occurs. This equation was estimated for all possible break years and residuals were obtained for all equations. Break time, third quarter of 2000 was determined in which the ADF unit root test statistic for the residuals are highest. Estimated Gregory–Hansen cointegration equation and unit root test statistics for the residuals are shown below;

$$EXP_t = \underset{(0,016)}{0,004} + \underset{(0,028)}{0,061\phi_{tb}} + \underset{(0,082)}{0,690IMP_t} - \underset{(0,109)}{0,146IMP_t\phi_{tb}} \qquad \text{(Eq. 53)}$$

Table 6.14

Engle and Granger Cointegration Test

	ADF		PP		DF GLS
	None	Intercept	None	Intercept	None
RESIDUALS	-4.60***	-4.57**	-4.69***	-4.66***	-4.33***

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% - 5% and 1% levels.
Residuals obtained from Cointegration Equation (Eq. 53).

Wald Test result for the hypothesis of $\alpha_1 = 0$ and $\beta_1 = 1$ is F = 120.2 and prob.= 0

6.2.1.4 Conclusion

Foreign trade is the most important item of the current account. From the point of view that the sustainability of the current account reasonably depends on the foreign trade balance, cointegration relation between the export and the import ratios to the GDP for Turkey was searched by different empirical criteria to judge whether the exports and imports in a below figure are moving together and do not drift from each other much.

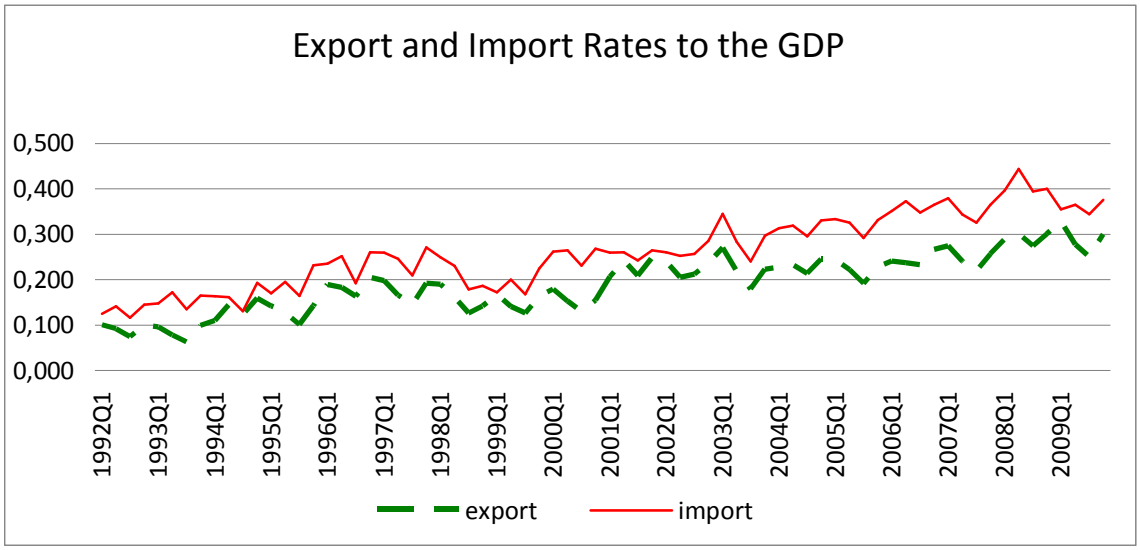

Figure 6.9: Export and Import Rates

When it is assumed that there are no structural breaks in the behavior of the foreign trade items for more than the last twenty years, it can be seen from the above results that the necessary condition (weak form) for the Turkish economy to satisfy its intertemporal budget constraint in foreign trade is satisfied by the existence of a stationary error structure, that is, ϵ_t in equation 48 (obtained from equation 50) is a stationary process. However, the necessary and sufficient condition (strong form) for the intertemporal budget constraint model is not satisfied since the hypothesis of the vector $(\alpha,\beta) = (0,1)$ for the equation 50 is rejected with a probability of zero. According to these results, it can be argued that the current account deficits of Turkey are only weakly sustainable. Even though the exports and imports have a long run relationship and move together (this relationship is approved by only one of two cointegration tests above), exports seem to compensate only 72,9 percent of the imports which means that the foreign trade deficit of the country becomes larger and larger as time passes.

The period that is used to analyze the foreign trade of Turkey includes severe economic crisis occurred in home, trade partners and competitors. Households' and firms' perceptions and reactions to the crisis were shaped variously according to the different economic policies implemented by the governments. For that reason, it might be beneficial to analyze the subject by assuming that there are structural breaks in the export and import dynamics of the country. Investigation of structural breaks in the variables separately results with two different time point; second quarter of 1998 for imports and first quarter of 2001 for exports. Structural break and increase in the imports can be illustrated by the 1998 Asian-Russian crises and devaluations made by those countries after the crises which makes their export cheaper. Also, appreciated Turkish Lira because of the disinflation program in 1999 has caused the imports to increase. Structural break and decrease in the exports can be illustrated by the financial crisis in 2001 besides the progressive competition in the export markets especially Chinese penetration in textiles and European Union regulations for exported goods.

When the sustainability issue is considered, results are quite similar to the stable case; the necessary condition for the economy to satisfy its intertemporal budget constraint in foreign trade is satisfied by the existence of a stationary error structure,

that is, ϵ_t in equation 52 (obtained from equation 53) is a stationary process. However, the necessary and sufficient condition for the intertemporal budget constraint model is not satisfied since the hypothesis of the vector $(\alpha_1,\beta_1) = (0,1)$ for the equation 52 is strongly rejected with a probability of zero. According to these results, it can be argued that the current account deficits of Turkey are only weakly sustainable. Moreover, results of this case approve the above interpretations about the time and reasons of structural breaks. Even though the exports and imports have a long run relationship and move together with structural breaks, exports seem to compensate 69 percent of the imports until the break in third quarter of 2000 whereas it only compensates 54,4 percent after 2000. This means that, the path of unsustainable foreign trade become more dangerous after 2000.

6.2.2 Excessiveness of Current account

6.2.2.1 Data

Data are obtained from the Central Bank of the Republic of Turkey and Turkish Statistical Institute. Turkish Lira values of all the variables are used. The frequency of the data is quarterly between 1987:1 and 2009:4. There are some summary statistics about the variables in the tables below.

Table 6.15

Definition of the Variables

CONS	Final Consumption Expenditure (constant prices, billion tl)
CASH	National Cash Flow (constant prices, billion tl)
CASHD	Domestic Cash Flow (constant prices, billion tl)
Q	Gross National Product (constant prices, billion tl)
Y	Gross Domestic Product (constant prices, billion tl)
I	Gross Capital Formation (constant prices, billion tl)
G	Government Expenditure (constant prices, billion tl)

Table 6.16

Descriptive Statistics for the Variables

	Mean	Median	Max	Min	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	Obs.
CONS	19415	19096	26340	14364	3141	0.601	2.642	4.133	83
CASH	17298	16498	29386	9487	4911	0.657	2.646	7.106	83
CASHD	17280	16112	29516	9417	5099	0.643	2.471	7.419	83
Q	29424	28283	48140	17291	7319	0.551	2.706	3.417	83
Y	28637	27380	50772	13464	9039	0.483	2.469	4.661	83
I	7781	7407	13683	3911	2191	0.704	2.924	5.212	83
G	2244	2201	3623	1238	620	0.674	2.674	5.044	83

6.2.2.2 Methodology

According to intertemporal model of current account determination by Ghosh and Ostry (1995), when national cash flow increases there will be a current account deficit where national cash flow is computed as the difference between GDP and investment and government spending ($y_t - i_t - g_t$).

Ghosh and Ostry (1995) argue that a country is more likely to borrow if they are growing. The model assumes a small open economy that has a single infinitely lived representative agent. The agent's utility function is given by

$$U = \sum_{i=0}^{\infty} \beta^i E[U(C_{t+i})] \qquad \text{(Eq. 54)}$$

where β is the discount rate between 0 and 1, u is the utility function and c is consumption of a single traded good. The period utility function $u(C)$ is strictly increasing in consumption and strictly concave: $U'(C) > 0$ and $U''(C) < 0$. Utility is maximized subject to a dynamic budget constraint given by

$$b_{t+1} = (1+r)b_t + y_t - c_t - i_t - g_t \qquad \text{(Eq. 55)}$$

where b is the level of foreign bonds held by the economy, r is the world rate of interest, y is GDP, i is the level of investment, and g is government expenditure. The current account balance is given by

$$ca_t = b_{t+1} - b_t \qquad \text{(Eq. 56)}$$

Taking expectations of (55) and eliminating future values of the stock of foreign assets results with the intertemporal budget constraint;

$$-(1+r)b_t = \sum_{j=0}^{\infty} \frac{1}{(1+r)^j}\left[E_t\left(y_{t+j} - c_{t+j} - i_{t+j} - g_{t+j}\right)\right] + \lim_{T\to\infty} \frac{1}{(1+r)^T} E_t(-b_{t+T+1}) \qquad \text{(Eq. 57)}$$

In order to the country's budget processes be externally solvent rules out Ponzi games in which debt is continually rolled over. External solvency requires that the last term in (57) must equal zero. If this is satisfied, the discounted value of the expected future stock of debt converges to zero as the time horizon goes to infinity. Equation (57) then implies that;

$$-(1+r)b_t = \sum_{j=0}^{\infty} \frac{1}{(1+r)^j}\left[E_t\left(y_{t+j} - c_{t+j} - i_{t+j} - g_{t+j}\right)\right] = \sum_{j=0}^{\infty} \frac{1}{(1+r)^j} E_t(TB_{t+j}) \qquad \text{(Eq. 58)}$$

Current outstanding real stock of debt, $-(1+r)b_t$, must be equal to the present discounted value of current and expected future trade balance surpluses, TB. Necessary conditions for the representative agent's optimal consumption decision problem include

$$U'(C_t) = \beta(1+r)E_t[U'(C_{t+1})] \qquad \text{(Eq. 59)}$$

For an empirical implementation, we consider the case in which the period utility is quadratic;

$$U(C) = C - \frac{a_0}{2}C^2 \qquad \text{(Eq. 60)}$$

which brings the equation (59) to the form of;

$$1 - a_0 C_t = \beta(1+r)[1 - a_0 C_{t+1}] \qquad \text{(Eq. 61)}$$

If the subjective discount factor β and the market discount factor $1/(1+r)$ are equal so that $\beta(1+r)=1$, equation 61 implies $C_t = C_{t+1} = \ldots\ldots\ldots\ldots = C_{t+j+1}$ which

shows the representative agent's consumption smoothing motive. When the subjective discount factor β is different from the market discount factor 1/(1+*r*) the representative agent has a consumption tilting motive as well as a consumption smoothing motive: if β is smaller than 1/(1+*r*) agent wants to tilt consumption to the present, if β is higher than 1/(1+*r*) agent wants to tilt consumption to the future. Formulating the equation 61 in terms of discount factors and substituting it into equation 57 gives the optimal consumption as;

$$c_t^* = \frac{r}{\theta}\left\{ b_t + \frac{1}{1+r} E_t \left[\sum_{j=0}^{\infty} \frac{1}{1+r^j} \left(y_{t+j} - i_{t+j} - g_{t+j} \right) \right] \right\} \qquad \text{(Eq. 62)}$$

where c_t^* is the optimal path of consumption and θ is the proportion that reflect consumption tilting which is given by the relation between rate of interest r and the rate of time preference β. If $\theta < 1$, then the country is consuming more than the national cash flow which means the country is tilting consumption to the present. If $\theta > 1$ then the country is consuming less than the national cash flow which implies that the country is tilting consumption to the future. If $\theta = 1$ then consumption equals the national cash flow. There is no consumption tilting in this case. From optimal consumption c_t^*, we can compute the optimal consumption smoothing current account ca^* as follows

$$ca^* = q_t - i_t - g_t - \theta c_t^* \qquad \text{(Eq. 63)}$$

where $$q_t = y_t + rb_t \qquad \text{(Eq. 64)}$$

If output rises relative to its permanent value, then there is a current account surplus implying that the country is lending. If output falls below its permanent value, there is a deficit reflecting borrowing. This is consumption smoothing behavior. Ghosh (1995) argues that the focus on the consumption-smoothing current account is valid for two reasons. Firstly, it is simpler to model borrowing or lending behavior for consumption smoothing rather than consumption tilting. Also, consumption smoothing is a stationary series which implies that standard econometric techniques may be used.

Combining equations (62) and (63) we get the optimal consumption smoothing current account

$$ca_t^* = -\sum_{j=1}^{\infty} \frac{1}{(1+r)^j}\left[E_t\Delta\left(y_{t+j} - i_{t+j} - g_{t+j}\right)\right] \quad \text{(Eq. 65)}$$

or in short;

$$ca_t^* = -\sum_{j=1}^{\infty} \frac{1}{(1+r)^j}\left[E_t\Delta\left(Z_{t+j}\right)\right] \quad \text{(Eq. 66)}$$

where Δ is the backward difference operator such that $\Delta = x_t - x_{t-1}$ From above equation, the optimal consumption smoothing current account is related to the present discounted value of the expected changes in the national cash flow. And comparing this optimal consumption smoothing current account with actual consumption smoothing current account, it can be judged whether the current account deficit is sustainable or not. This equation shows that creating the model implied consumption smoothing component of the current account series requires estimating the present value of expected changes in net output, where expectation is conditional on the information set used by the representative agent. As shown by Campbell and Shiller (1987), under the null hypothesis that this equation is valid, the consumption smoothing component of the current account itself should incorporate the entire representative agents' information on future net output changes. This consideration has led the existing literature to estimate an unrestricted VAR in $\Delta\left(Z_{t+j}\right)$ and ca_{t+j} where ca_{t+j} is the actual consumption smoothing component of the current account. (Kim et. all. 2001). The VAR system can be written as

$$\begin{pmatrix} \Delta Z_{t+j} \\ ca_{t+j} \end{pmatrix} = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix} \begin{pmatrix} \Delta Z_{t+j-1} \\ ca_{t+j-1} \end{pmatrix} + \begin{pmatrix} \varepsilon_{1t+j} \\ \varepsilon_{2t+j} \end{pmatrix} \quad \text{(Eq. 67)}$$

And substituting into equation 65 above leads to the estimation of the optimal consumption smoothing current account as;

$$ca_t^* = -\sum_{j=1}^{\infty} \frac{1}{(1+r)^j} [1 \quad 0](A)^j \begin{pmatrix} \Delta Z_t \\ ca_t \end{pmatrix} = -[1 \quad 0]\left(\frac{A}{1+r}\right)\left(I - \frac{A}{1+r}\right)^{-1} \begin{pmatrix} \Delta Z_t \\ ca_t \end{pmatrix} \quad \text{(Eq. 68)}$$

where $A = \begin{pmatrix} a_{11} & a_{12} \\ a_{21} & a_{22} \end{pmatrix}$ which can be simplified as

$$ca_t^* = \begin{pmatrix} \lambda_1 & \lambda_2 \end{pmatrix} \begin{pmatrix} \Delta Z_t \\ ca_t \end{pmatrix} \quad \text{(Eq. 69)}$$

6.2.2.3 Empirical Results

In the empirical work firstly the national cash flow variable is obtained as indirectly or directly respectively in equations (70) and (71);

$$CASH = y_t + rb_t - i_t - g_t \quad \text{(Eq. 70)}$$

$$CASH = q_t - i_t - g_t \quad \text{(Eq. 71)}$$

Then, seasonality detected variables CASH and CONS are seasonally adjusted. Then the variables have been checked for stationarity by using Augmented Dickey-Fuller, Phillips-Perron, Dickey-Fuller Generalized Least Square and Kwiatkowski-Phillips-Schmidt-Shin unit root tests. By referring the weaknesses of the conventional unit root tests in case of the structural breaks that were mentioned above, Zivot – Andrews unit root test was also performed. Test Results are summarized in the below tables:

Table 6.17

Unit Root Test Statistics for Variables

	ADF		PP		DF GLS		KPSS	
	Trend and Intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept	Trend and intercept	Intercept
CASH	-1.54	1.02	-4.65***	0.39	-1.49	2.68***	0.25°°°	1.27°°°
CONS	-2.47	0.757	-4.32***	-0.19	-2.34	1.64*	0.17°°	1.14°°°
ΔCASH	-10.10***	-9.94**	-60.8***	-29.8***	-6.46***	-9.09***	0.12°	0.37°
ΔCONS	-5.79***	-5.26***	-28.6***	-24.3***	0.04	-1.27	0.09	0.20

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% , 5% and 1% levels.
° - °° and °°° denotes the rejection of the null hypothesis of stationary at 10% , 5% and 1% levels.

Table 6.18

Zivot – Andrews Unit Root Test Statistics for Variables

	α_1	α_2	β_1	β_2	Θ	t-stat (θ)	Break time	lag
CASH	9402	-1342	126	141	-0.921	-4.883	2000:1	4
CONS	8694	-2650	118	142	-0.747	-4.999	2000:4	6

Critical values for unit root test are -5,57 (1%), -5,08 (5%) and -4,82 (10%) from table 4 in Zivot - Andrews (1992)

According to the conventional unit root test results; both CASH and CONS are found nonstationary. They could become stationary after taking their first differences. Zivot – Andrews test results also support them; both t statistics for CASH and CONS are lower than the critical values which show that series have unit root. There are other results from the tests that cash variable has a structural break in the first quarter of 2000 and consumption variable has a structural break in the second quarter of 2000.

Then, optimal lag length is decided according to the Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwartz Information Criterion (SC), Hannan-Quinn Information Criterion (HQ). FPE and AIC select 6 whereas LR, SC and HQ select 5 as an optimal lag. In the below table, Lag length selection criteria and their calculated values are presented:

Table 6.19

VAR Lag Length Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	3.5e+13	36.87	36.93	36.90
1	251.5	1.75e+12	33.86	34.04	33.93
2	29.90	1.32e+12	33.58	33.87	33.70
3	5.263	1.36e+12	33.61	34.01	33.77
4	23.65	1.09e+12	33.39	33.91	33.59
5	25.59*	8.45e+11	33.13	33.77*	33.39*
6	8.574	8.25e+11*	33.10*	33.86	33.41
7	4.983	8.47e+11	33.13	34.00	33.48
8	4.376	8.75e+11	33.16	34.14	33.55

The cointegration relation between CASH and CONS is searched by the cointegration test with 6 lag of each variables:

Table 6.20

Johansen Cointegration Test

No. of CE vectors	Eigenvalue	Trace Statistic	0.05 Critical Value	Probability
None *	0.1783	23.640	20.261	0.016
At most 1	0.0784	6.9464	9.1645	0.129
No. of CE vectors	Eigenvalue	Max Eigen Statistic	0.05 Critical Value	Probability
None *	0.1783	16.693	15.89	0.037
At most 1	0.0784	6.9464	3.841	0.129

* denotes rejection of the hypothesis at the 0.05 level

Estimated cointegration relationship (CASH=θCONS) is;

$$CASH = 0{,}985 * CONS \qquad \text{(Eq. 72)}$$

Residuals from the regression $CASH = -1430 + 0{,}985 * CONS$ (0,027) (Eq. 73)

are also stationary:

Table 6.21

Engle and Granger Cointegration Test:

	ADF		PP		DF GLS
	None	Intercept	None	Intercept	None
RESIDUALS	-2.92***	-2.90**	-3.99***	-3.96***	-2.80***

* - ** and *** denotes the rejection of the null hypothesis of unit root at 10% , 5% and 1% levels.
Residuals obtained from Cointegration Equation (Equation 73).

This cointegrating relationship constitutes the actual consumption smoothing current account ($CAACT = CASH - \theta CONS$) ;

$$CAACT = CASH - 0{,}985 * CONS \qquad \text{(Eq. 74)}$$

Gregory – Hansen (1996) cointegration test was also performed to determine whether the parameters in the cointegration relation are stable or not over time as a result of possible structural breaks. Time of structural break is also endogenously

determined in the test. The test was performed by estimating the below equation with OLS;

$$CASH_t = \alpha_1 + \alpha_2\phi_{tb} + \beta_1 CONS_t + \beta_2 CONS_t\phi_{tb} + \varepsilon_t \qquad \text{(Eq. 75)}$$

$$\text{where } \phi_{tb} = \begin{cases} 1 & \text{if } t > tb \\ 0 & otherwise \end{cases}$$

In above test equation, tb refers to the year that possible structural break occurs. This equation was estimated for all possible break years and residuals were obtained for all equations. Break time, second quarter of 2001 was determined in which the ADF unit root test statistic for the residuals are highest. Estimated Gregory – Hansen cointegration equation and unit root test statistics for the residuals are shown below;

$$\underset{\quad(765)}{CASH_t = 1027} + \underset{(1238)}{3394\phi_{tb}} + \underset{(0,04)}{0,81 CONS_t} - \underset{(0,06)}{0,04 CONS_t\phi_{tb}} \qquad \text{(Eq. 76)}$$

Optimal consumption smoothing current account is defined as ($CAOPT = CASH - \theta CONS^*$) ;

$$CAOPT = CASH - 0,985 * CONS^* \qquad \text{(Eq. 77)}$$

In order to compute the optimal consumption smoothing current account, VAR setup is constructed with one lag;

$$\Delta Z_{t+j} = a_{11}\Delta Z_t + a_{12} ca_t \qquad \text{(Eq. 78)}$$

$$ca_{t+j} = a_{21}\Delta Z_t + a_{22} ca_t \qquad \text{(Eq. 79)}$$

and estimated coefficients $a_{11} = -0.561$ $a_{12} = -0.163$ $a_{21} = -0.050$ $a_{22} = 0.865$ are used to compute $\lambda_1 = 0.330$ and $\lambda_2 = 0.590$. Finally, optimal consumption smoothing current account is;

$$CAOPT = \begin{pmatrix} 0.330 & 0.590 \end{pmatrix} \begin{pmatrix} \Delta Z_t \\ ca_t \end{pmatrix} \qquad \text{(Eq. 80)}$$

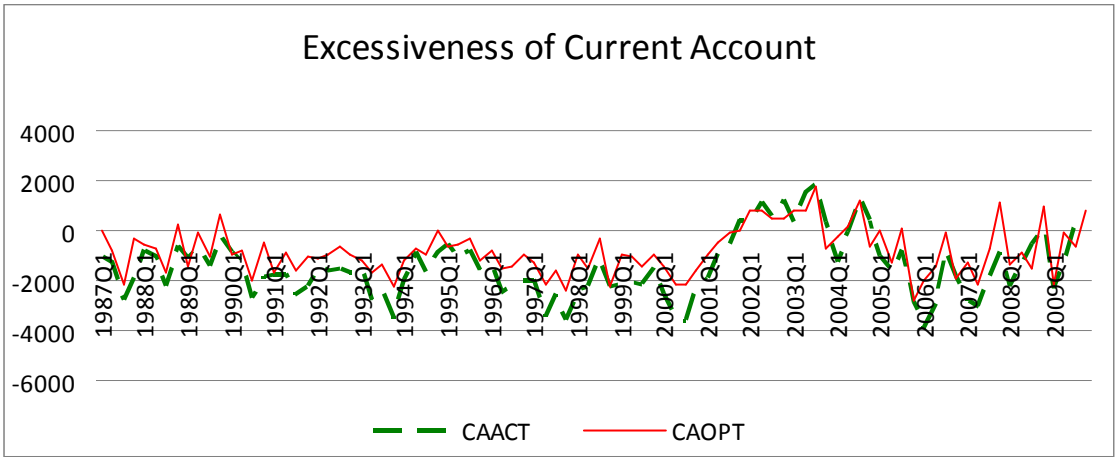

Figure 6.10: Excessiveness of Current Account

After obtaining actual consumption smoothing current account and optimal consumption smoothing current account series, there have to be some comparisons and tests about the consumption smoothing model's conclusions. Firstly, granger causality test was performed whether the actual current account causes consumption and it was decided that current account does not granger cause of consumption since the hypothesis of no causality is accepted with a probability of 0,82. Secondly, coefficient restriction tests were performed as $\theta = 1$ both for equation 73 with no structural break and equation 76 with structural break. The hypothesis of $\theta = 1$ was accepted for equation 73 with a probability of 0,59 but rejected for equation 76 with a probability of 0. Finally, comparison of the variances of actual and optimal series has exhibited that variance of the series are not equal; variance of the actual current account is 1,64 times higher than the variance of the optimal current account.

6.2.2.4 Conclusion

Definition of the current account balance as the difference between the national cash flow and the consumption is a widely used one. According to the argument that the sustainability of the current account highly depends on the saving balance, cointegration relation between the cash flow and the final consumption expenditure for Turkey was searched by different empirical criteria to judge whether they move together and do not

drift from each other much in the long run. Empirical results have confirmed the long run relationship of the variables and the cointegration coefficient, which is also called as consumption tilting parameter in the excessiveness framework, has found as 0,985. It denotes that Turkey is consuming more than the national cash flow which means the country is tilting consumption to the present.

With respect to the discussions in the previous section about foreign trade, it might be beneficial to analyze the subject by assuming that there are structural breaks in the cash flow and consumption dynamics of the country. Investigation of structural breaks in the variables separately results with same year; first quarter of 2000 for cash and last quarter of 2000 for consumption. Even though the cash flow and the consumption series have a long run relationship and move together with structural breaks, cash flow seems to compensate 81 percent of the consumption until the break in third quarter of 2001 whereas it only compensates 77 percent after 2001. This means that, the path of unsustainable consumption behavior become more and more excessive after 2001.

Time of the structural break in the cointegration relation between cash and consumption variables is not a coincidence when the 2001 economic crisis in Turkey was remembered. Similarly, decreasing of consumption tilting parameter after 2001 is an outcome of high liquidity in the world and high interest rate-low exchange rate policy in Turkey after the 2001 crisis. Surpluses seen in the current account for the years just after the crisis in figure 6.10 can be explained with the perception of households that they have to cut their consumptions in order to escape from the difficult conditions of the crisis. Also, it has been seen from the figure that the actual current account exceeds the optimal current account for those years which shows that the capital inflows were contracted as a result of macroeconomic deterioration of the crisis.

Visual inspection from the figure 6.10 that both the actual and the optimal consumption smoothing current accounts move together in the long run and do not drift from each others much. They seem to move together but the actual current account is more volatile than the optimal current account; in all of the deficit periods actual current account is below the optimal one, and in most of the surplus periods it is above the

optimal one except for the last years. Variance ratios of the variables found above confirm this as well which suggests that the current account deficit is excessive for Turkey.

Analysis of the actual and the optimal consumption smoothing current accounts has demonstrated that there are strong evidences for violation of the intertemporal balance in Turkey especially for the last decade. The economic policies implemented so far have contributed to the violation of intertemporal budget constraint of the country. This conclusion brings the ability to pay into the agenda and the country can sustain its current account deficits as long as the continuation of capital inflows if the implemented economic policies do not change.

6.2.3. Markov Switching Models to Assess Sustainability

6.2.3.1 Data

Current Account to GDP ratio is the only variable used in this method. Data are obtained from the Central Bank of the Republic of Turkey. Current Account Balance data is obtained as US Dollar and transformed to Turkish Lira by using the monthly averages of the Exchange rate of the Central Bank of the Republic of Turkey. Since the observations for Gross Domestic Product is obtained only for each quarter in the period, current account variable is transformed to the quarterly data. The frequency of the data is quarterly between 1987:4 and 2010:4.

6.2.3.2 Methodology

Different tests have been developed to provide an answer to the question of whether accumulating debt due to current account deficits over time is sustainable. These tests basically assume the rate of growth of the economy and the pattern for the trade balance as given, therefore implying that the economy will go on to progressing as it did in the past. These types of tests typically provide a definite answer: they reject sustainability or not. This method offers an alternative complementary procedure inspired by the reality that the stochastic properties of the variables in the analysis are

generally subject to structural breaks which are expressions of policy changes taking place over the period. It imposes identifying restrictions which describes states for the current account as being related to the stationary and nonstationary periods in the sample period, and hence, it appears to be consistent with the long run budget constraint. This type of analysis can accommodate situations when the debt might be sustainable in the long-run even though the economy may depart from the sustainable path for some sub periods. (Raybaudi, Sola and Spagnolo, 2004, p. 217).

Since the solvency concept is evaluated in the long-run, countries may be faced with debt problems for sub periods even though the condition of long-run sustainability holds. The purpose of the usage of Markov switching model is to discover the circumstances where the countries might satisfy the solvency criterion, but faced with important short run imbalances which may become high enough to violate solvency in the future: when the long-run sustainability condition is satisfied but the presence of temporary deviations from this condition providing a danger that country may likely to facedebt problems in the future. Therefore, it tries to identify sub periods in which the current account deficits look as nonstationary: If the time period that economy stays in these subperiods become longer, the probability of the violation of solvency will increase. The econometric methodology proposed in the Markov switching models allows us to distinguish periods that are associated with unsustainable outcomes from those in which the solvency condition holds. (Raybaudi et al, 2004, p. 219).

The Markov-switching model, also known as regime switching model, developed by Hamilton (1989), is one of the most popular non-linear time series models. In this model, non-linearities arise if processes are confronted with discrete shifts in regime. By permitting switching between these N regimes, in which the dynamic behavior of series is markedly different, more complex dynamic patterns can be characterized. The switching mechanism is controlled by an unobservable state variable that follows a first-order Markov chain. Altuğ and Bildirici (2010, p.5) defined the algorithm of Hamilton's model in their application of business cycles around the globe. Following their definition, when the current account balance is defined as a sum of its trend and cycle components like;

$$cab_t = tr_t + cy_t \quad \text{(Eq. 81)}$$

where cab denotes the current account balance, tr denotes the trend component and cy denotes the cycle component. Trend component depends on an unobserved Markov state variable denoted as s_t;

$$tr_t = \alpha_1 s_t + \alpha_0 + tr_{t-1} \quad \text{(Eq. 82)}$$

Differencing results with;

$$\Delta cab_t = \alpha_1 s_t + \alpha_0 + \Delta cy_t \quad \text{(Eq. 83)}$$

Hamilton (1989) considered a Markov switching model as mean of the process changes according to the unobserved state

$$y_t - \mu(s_t) = \beta_i \sum_{i=1}^{n} (y_{t-i} - \mu(s_{t-i})) + \varepsilon_t \quad \text{(Eq. 84)}$$

The probability that the state variable equals some particular value j depends on the past only through the most recent value s_{t-1}:

$$P\left\{s_t = j \,|\, s_{t-1} = i \ , \ s_{t-2} = k \ , \ .....\right\} = P\left\{s_t = j \,|\, s_{t-1} = i\right\} = p_{ij} \quad \text{(Eq. 85)}$$

As such, a structure may prevail for a random period of time, and will be replaced by another structure when switching takes place. The transition probability p_{ij} gives the probability that state i will be followed by state j. Clearly, the transition probabilities satisfy

$$p_{i1} + p_{i2} + ... + p_{iN} = 1 \quad \text{(Eq. 86)}$$

Three-regime Markov-switching Auto Regressive model can be presented in a matrix format such as;

$$P = \begin{pmatrix} p_{11} & p_{12} & p_{13} \\ p_{21} & p_{22} & p_{23} \\ p_{31} & p_{32} & p_{33} \end{pmatrix} \quad \text{(Eq. 87)}$$

6.2.3.3 Empirical Results

Using Markov Switching Auto Regressive process with three regimes, current account behavior of the Turkish Economy for the last 20 years was analyzed in order to reveal the sustainable, unsustainable and crisis periods besides discovering the probabilities of emerging of such periods. These three regimes are defined as; crises, unsustainable current account deficits which lead into crises, sustainable current account balances. Matrix of transition probabilities for the two regimes is shown below;

$$P = \begin{pmatrix} 0.831 & 0.098 & 0.070 \\ 0.084 & 0.865 & 0.050 \\ 0.125 & 0.178 & 0.696 \end{pmatrix} \quad \text{(Eq. 88)}$$

According to the above matrix, it can be argued that the probability of persistency in the crises paths is 0,831 whereas the probabilities of transition to the unsustainable path and to the sustainable path from the crisis are 0,098 and 0,070 respectively. The probability of persistency in the unsustainable paths is 0,865 whereas the probabilities of transition to the crisis path and to the sustainable path from the unsustainable path are 0,084 and 0,050 respectively. The probability of persistency in the sustainable path is 0,696 whereas the probability of transition to the crisis path and to the unsustainable path from the sustainable are 0,125 and 0,178 respectively.

In other words, the probability of being in a crisis in time *t* conditional on the current account balance being in a crisis regime in time *t*-1 is estimated as about 83,1% whereas conditional on the current account balance being in an unsustainable and sustainable regimes in time *t*-1 are estimated as about 8,4% and 12,5% respectively.

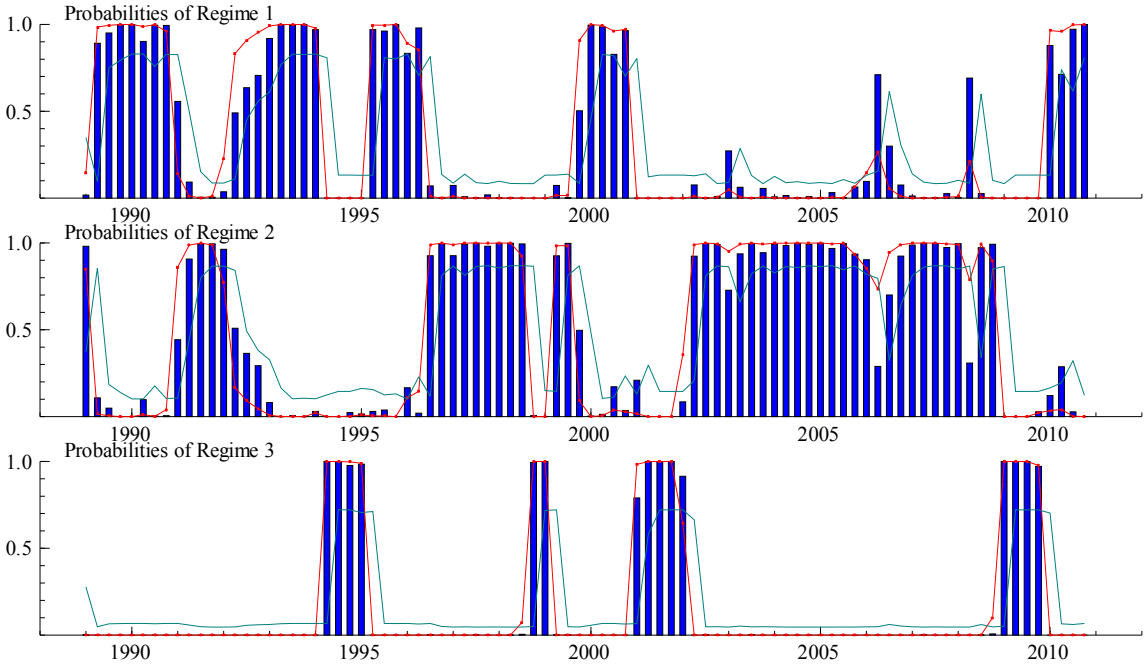

Figure 6.11: Probabilities of Regimes for Current Account

In the figure 6.11, crisis, unsustainable and sustainable regimes for the current account balance in respect of observation years are presented. It shows the smoothed probabilities of being in regime 1 (crisis regime), regime 2 (unsustainable regime) or regime 3 (sustainable regime). According to the empirical results and figure, 29 observations are classified in regime 1 whereas 43 observations are in regime 2 and 15 observations are in regime 3. Duration of regimes are 5,9 quarter, 7,4 quarter and 3,2 quarter respectively.

6.2.3.4 Conclusion

Figure 6.11 shows that several shifts between the regimes took place over time. These shifts coincide especially with the economic crises in Turkey for the last two decades. Regime 1, which is called as crisis regime, strongly emerges in the years 1994, 1996, 2001 and 2010. Economic crisis that were realized in 1994 and 2001 can be explained well with the unsustainable behavior of current account balance. Although 1996 appears as crisis period for the current account, it has not realized which gives rise to an idea that MS model overestimate the crises in the current account balance.

Periods that are defined as unsustainable by the MS model emerges generally before the crisis periods such as 1993, 1999-2000 and 2003-2008. Probability of switching from unsustainable regime to the crisis is so small that the economy can stay in the sustainable path for a long time. Explanation of this situation lies in the definition of the Markov Switching process; countries might satisfy the solvency criterion, but faced with important short run imbalances which may become high enough to violate solvency in the future: when the long-run sustainability condition is satisfied but the presence of temporary deviations from this condition providing a danger that country may likely to be faced with debt problems in the future. This can also be seen from the duration of the regimes; duration of the unsustainable regime is higher than the other regimes indicates that economy can stay in the unsustainable path long enough without violating the solvency condition. However, the longer the economy stays in these periods, the more likely that they end up with a balance of payments crisis.

It is so interesting that, according to the time profiles of the regimes in figure 6.11, Turkey seems to be in a crisis regime since the first quarter of 2010. This may be an informative alert for the Turkish economy about oncoming balance of payments crisis in a year.

7. EVALUATION OF SUSTAINABILITY

In this part, all of the available knowledge is going to be used and evaluated objectively and carefully in order to conclude about the causes and the consequences of the current account deficit in Turkey recent years. First, sustainability concept will be undertaken theoretically and discussed in terms of some macroeconomic indicators from the points of views of both Turkey and international investors. Then, composition and evolution of the current account deficit and financing configurations in Turkey will be provided to reach a conviction about the sustainability position of the deficits.

7.1. Discussion of Sustainability in terms of Selective Theoretical Indicators

In this thesis, many econometric techniques have been used in order to evaluate the notion of sustainability. However, if we interpret the current account as a dynamic process in which it is determined by the outcome of the actions and expectations of forward-looking private agents, these empirical researches will not be sufficient for understanding the sustainability of the current account deficits. The issue should be analyzed both from empirical and theoretical perspectives for two main reasons. First, the current account deficit may seemed to be sustainable with the empirical tests but this can only be true for considering the ability to pay concept; it does not take into account the willingness of foreigners to continue to provide funds for the domestic country to sustain its deficits. Mann (2002) argues that in order for a country to sustain its current account deficits, foreign investors must continue to be willing to purchase its assets. If the demand for its assets is lower than the amount of supply needed for the sustainability, the interest rate it offers will be higher since the foreigners demand higher return and/or the exchange rate will be depreciate since the excess demand for foreign currencies which are treated as signals of unsustainability from the point of view of the foreign investors. Second, it does not make judgments about whether the continuing deficits would be desirable or which policies should be implemented to reduce the deficits without deteriorating the other macroeconomic conditions. Milesi-Ferreti and Razin (1996b) criticize the solvency and empirical studies related to it by arguing that those consider only ability to pay but abstracts from the willingness to pay; “The present value of the trade surpluses may theoretically be sufficient to repay the

country's external debt, but the country may lack sufficient incentives to divert output from domestic to external use in order to service the debt." (1996b, 2). Hence, they claim that, in order to understand the potential implications of current account imbalances, the notion of sustainability should be analyzed in a broader sense which takes into account both willingness to pay and willingness to lend considerations as well as ability to pay. Thus, in this part of the thesis, both theoretical and empirical criteria to sustain the current account deficit will be provided. Also, policy implications will be derived by considering the interrelationship of the current account with some other variables such as the level of international competitiveness, the strength of the financial system and the degree of political stability.

Theoretically, when a country's output (income) grows, its demand for foreign goods and services accelerates which results with the deterioration in the trade balance and causes the current account to deteriorate since the trade balance is a most large component in size of the current account. Growth and industrial production especially depends on the imported intermediate goods in Turkey which causes foreign trade deficits in line with GDP growth. Income elasticity of import is 2.24 which imply that as the economy grows, current account deficits are unavoidable. In the analyzing period, years of current account deficits are usually associated with high growth rates whereas current account surpluses are emerged in the crises years where the growth rates are negative or so small. This argument about negative relationship between the growth and current account balance is proved in the empirical part of this thesis that when the growth rate of the economy increase 10 percent, current account deficit to GDP ratio increases 3 percent in the long run. Also, impulse response analysis shows that in the short run, negative effect of growth on the current account is much higher.

Growth is not only a cause of current account deficits, but also an important criterion for its sustainability. The higher the growth rate of the economy, the easier it is to service accumulated stock of its net international investment obligations without significantly affecting the behavior of domestic spending. Hence, higher long run growth allows a country to continue running a current account deficit for longer than a country with slower long run growth. In addition, growth signals confidence to foreign

investors which increase their willingness to lend. Thus, factors that cause higher growth become important in determining the sustainability of external imbalances since they determine the country's ability to service its external obligations in the future. "If the growth rate exceeds the real rate of interest on external debt, then addition to total GDP is greater than that of external debt. Economic growth thus becomes an important variable in assessing the external position of a country" (Adedeji and Handa, 2008, p.7). If the high growth rates and low real interest rates in the last years are taken into consideration for Turkey, it can be argued that these are the positive signals for the sustainability of the current account deficit.

National income identity reveals that the current account can be defined as saving minus investment, hence it can be expected theoretically that increase in the investment level leads to a current account deficit. This argument about negative relationship between the investment and current account balance is proved in the empirical part of this thesis that when the investment rate of the economy increase 10 percent, current account deficit to GDP ratio increases 2,2 percent in the long run. Investment, by increasing the productive capacity and expected future income, is an indicator for sustainability. However, sustainability feature of the investment is to be carefully implemented. If the investment is directed to the less productive sectors which leads to the return from that investment is lower than the cost of borrowing, or heavily to the nontrading sectors which do not induce foreign exchange revenue, it will be one of the major reasons impeding the country's external debt repayments. This concept is seen from the impulse response analysis that the effect of investment on the current account balance becomes positive after five quarter but this effect does not compensate previous deteriorating effect since the investments were not directed to the profitable or tradable goods sectors as a result of political priorities or self fulfilling motives.

Cross country empirical works suggest that current account deficits are mainly due to fall in saving rather than increase in investment. Fall in savings are reflected in increasing consumption and import demand resulting with current account deficits. Accordingly, short run impact of saving is found as positive in the empirical work. However, effect of saving on the current account balance is found as negative in the

long run but it is negligible in magnitude. Beside investment, high saving rates also send creditworthiness signals to international investors since they raise the ability of a country to service its debt from the investors' perspective. Corsetti et al (1998) compare the effects of the public and the private saving rates on the current account and conclude that decrease in the public saving rate is more detrimental since the decline in the public saving is interpreted as reflecting some structural shift whereas decline in the private saving is seen as temporary. Calderon et al (2000) claim that shocks in the private saving rate are more heavily offsetted by increase in the investment rates than shocks in the public saving rates. "If private sector's external liabilities are not guaranteed by the government and the private economic agents base their saving decisions on the accurate forecast of relevant economic variables such as expected permanent income, a current account deficit arising from a private saving-investment balance is likely to be more sustainable than the one arising from a public saving-investment imbalance." (Adedeji and Handa, 2008, p.8). When the fiscal discipline in the public sector in Turkey after 2001 crisis is taken into account, it will be seen that deterioration in the saving – investment balance is primarily the result of increase in private sector's investments. Private sector has realized the %81 of total investments after 2001 crisis in Turkey. Moreover, ratio of machinery and equipment investments of private sector to total investments, which has more growth enhancing capacity than others in the total investments, has increased from 35% in 1990s to 51% after 2001 crisis. This situation improves the beliefs about sustainability of current account deficit in Turkey. Akçay and Üçer (2008, p.215) affirm this view by arguing that if the current account deficits are driven by lower saving, this reflects the excessive consumption whereas today's investment reflects tomorrow's growth. Investment to GDP rate had an upward trend from 15% levels after 2001 crisis to 25% levels until 2008 crisis whereas saving had a more stable structure between 15% and 20%.

Openness improves a country's ability to repay its debt. If it is defined as export to GDP ratio; higher levels of exports provide necessary foreign exchange to reduce external indebtedness, and debt service absorb lower fraction of the export receipts (Milesi-Ferretti and Razin, 1996a). Growth and the growth potential of the export sectors are also important for sustainable current account deficits. In case of

capital inflow fluctuations, high growth rate export sectors can be safeguards for the source of foreign exchange; if a country can increase its export revenue, it does not have to decrease its imports to balance the payments which have adverse consequences on the domestic industries relying on imported inputs (Sachs, 1985). In a relatively closed economy, if it is assumed that the small amount of import is due to compulsory need for the production, it will be more detrimental for that economy to lessen its imports (Milesi-Ferretti and Razin, 1996d, p.23). If openness is defined as sum of exports and imports to GDP ratio; international investors will perceive the more open economy as less risky and thus sudden reversals of capital inflows will be less likely since the cost of unsustainability of the current account deficit in terms of debt default will be higher through trade deteriorations if the economy is more open. Also, open capital account could serve as a signal of a country's commitment to pursuit of sustainable policies and thereby raise foreign investors' perception of the country's creditworthiness (Milesi-Ferreti and Razin, 1996a). "The degree of openness reflects policy choices such as liberalized trade; it also indicates receptiveness to technology transfers and capacity to generate export and foreign exchange earnings to pay external debt." (Chinn and Prasad, 2003, p.51-52). Furthermore, the necessary price change is lower and regulation is easier in more open economies for shifting the production to the export sectors and shifting the demand to the domestic products (Freund and Warnock, 2005, p.13). However, heavy dependence on export sector increases a country's vulnerability to external shocks such as decline in foreign demand in recessions or terms of trade fluctuations especially when the export base is narrow or heavily relies on a few commodities. Unfortunately Turkey specializes in low technology products, raw materials and food exports in which the number of sellers thus competition in the world is too much since most of the developing countries try to export the products in these categories voluntarily or due to the imperfections in the production of other high technology goods. Also, as more open economies attract more foreign capital, openness may increase current account deficits through increasing investment.

Complicated and strength financial sector with alternative forms of financial intermediation have considerable impact on the willingness to lend from the international investors' point of view. Also, countries with higher Foreign Exchange

(FX) reserves to Foreign Debt ratio and higher interest rates attract more capital inflow since these are the indicators for profitable and secure portfolio investment. High FX reserves are also an indicator of self sufficiency which measures the purchasing power of a country for imports without any support from international markets. CBRT's reserves have increased from 5 billion dollars in 1990 and 18,8 billion dollars in 2001 to 80,7 billion dollars in 2010. FX reserves to Foreign Debt ratio has also increased from 15% average in 1990s and 16,6% in 2001 to 27,8% in 2010 (FX reserves to short term foreign debt is higher than 1 for ten years). There are so many other factors that determine the investors' willingness to lend such as risk-return profile of the home country relative to other countries, the growth rate of the investors' portfolio of wealth, transaction costs, information and regulation (Branson and Henderson 1985).

High and persistent inflation brought about increase in savings due to uncertain macroeconomic environment. Inflation serves as a macroeconomic uncertainity and lack of monetary credibility. In such an environment, people do not make much investment and increase their saving through precautionary motive leading to a lower current account deficit. Following the analysis of inflation and current account balance data for Turkey it can be seen that average inflation rate between 1987 and 2001 was 73% with an average current account deficit 0.6% whereas average inflation rate between 2002 and 2009 was 8,6% with an average current account deficit 5.6%. This data demonstrate that there is a trade of between inflation and current account balance. Since the 2001 crisis, government and central bank have focused on decreasing inflation rate and adopted an appreciated Turkish Lira that has caused to worsen the current account deficit. However, "Commitment low and stable inflation is necessary to keep down the cost of issuing debt; it reassures holders of debt denominated in domestic currency that the value of this will not be eroded to the benefit of issuers." (Belkar, Cockerell and Kent, 2007, p.23).

The link between the economy's current account and the government's budget deficit is the subject of considerable policy debate and empirical testing among the economists. A claim that there is a positive correlation between the fiscal and current account deficits, the twin deficit hypothesis was tested by many empirical works.

However, there is no consensus about the issue until now. The traditional view suggests that increase in the fiscal deficit derives the current account into deficit by expanding the demand for goods and services including demand for imports. Large budget deficits also raise the domestic interest rates and hence the exchange rate which both causes a deficit in the current accounts (Hashemzadeh and Wilson, 2006). As a contributor of sustainability, higher fiscal deficits to GDP and interest payments to GDP ratios indicate a poor fiscal position and are detrimental for a country's ability to pay and foreign investors' willingness to lend. Hence, a weaker fiscal position has the potential to make the current account deficit unsustainable. Ricardian Equivalence states that if the households believe that the budget deficits today will be resulted with higher taxes in the future, they increase their saving to be able to pay higher future taxes which neutralize the impact of negative public saving due to budget deficit and improves the current account balance by contributing to the national saving. However, realizations of budget deficits and private savings in Turkey are totally different from the traditional view especially for between 2001 and 2008 crises. National saving rate is more or less stable over this period, but when it is decomposed into public and private savings, the balance in the composition of total saving is changing against the private sector since public saving has been increasing (budget deficit has been decreasing) after 2001 due to maintained fiscal discipline in the public sector.

Turkey is an emerging country with a growing economy challenged by a growing demand for energy. Balat (2009, p.112) argues that primary energy demand for Turkey has been growing annually 6% for decades. Energy consumption will continue to grow as long as growth in its economy continues. Furthermore, more than 70% of energy use is imported since energy consumption is high, but domestic energy reserves and their production levels are low. Total primary energy production met only about one quarter of the total primary energy demand in recent years. Akçay and Üçer (2008, p.216) calculated interestingly that the average of the non-energy current account balance is almost zero for the last ten years. Since oil has the biggest share in total primary energy consumption, it can be argued that oil prices deteriorate the current account position of Turkey. This argument about negative relationship between the growth in oil prices and current account balance is proved in the empirical part of this

thesis that when the oil prices increase 10 percent, current account deficit to GDP ratio increases 0,34 percent in the long run.

Some negative developments in the world energy market, such as conflicts between energy exporters and energy item's new position as a speculative asset in financial markets rather than commodity has increased the energy prices (Aytemiz and Şengönül, 2008, 95). Since Turkey is a net importer of energy, price increases in oil and natural gas have deepened the current account deficits by escalating the value of energy import. Oil had the biggest share in value of imports and oil prices were much volatile in last years. Price of Brent oil have climbed over 140 dollars per barrel in 2008 and 91 dollars per barrel in 2010 from 19 dollars at the end of 2001. Oil imports have risen to 48 billion dollars in 2008 and 38 billion dollars in 2010 compared to 8 billion dollars in 2001. However, as the growth in GDP was quite in that period, ratio of energy imports to GDP has not been changed much. If oil prices are going to be determined speculatively in the world and continued to be high as in the beginning of 2011, Turkey is going to have extremely high import bills inevitably, which causes trade deficits and raises the concerns about sustainability of the current account deficits.

Real exchange rate contributes to the determination of prices for tradable goods. Depreciation in the local currency immediately increases the trade bill for predetermined imports and decreases the foreign exchange revenue which causes current account deficit. As the time passes, decrease in the value of the home currency in terms of others stimulates the volume of exports according to the law of demand. This worsening of the current account immediately after real currency depreciation and beginning to improve later, is called a J curve hypothesis. Empirical findings in this thesis support this hypothesis from all perspectives. Effect of real exchange rate depreciation is negative for the current account in the short run through impulse response analysis. Also, it contributes to the current account balance little in the long run; when the real exchange rate appreciates 10 percent, current account deficit to GDP ratio decreases 0,49 percent. However, real exchange rate contributes to the price formation of tradable goods. If the prices are considered important for the time of trade is realized, it does not seem to have long term effectiveness on the current account

which are found empirically that the long run coefficient of real exchange rate is much smaller than the other variables in ARDL analysis. Realizations in Turkish foreign trade are consistent with these findings especially in the last decade. Real exchange rate seems to be stable in this period even though current account deficit has an increasing trend. There may be different explanations for this situation. When the real exchange rate is computed according to efficiency and unit labor cost variables, it does not seem to appreciate much. Also, nearly half of the exports are directed to the European Union and contemporaneous appreciation of Euro has helped to the continuation of exports. Furthermore, imports of Turkey are made up mostly from intermediate goods rather than consumption goods which do not depend on exchange rate much since they are considered as necessary goods as a result of their contribution to the industrial production and growth of the economy.

7.2. Evaluation of Composition and Financing of Current Account Deficits

When we look at the current account balance of Turkey between 1987 and 2010, foreign trade deficit emerges as a leading factor for the deficit in the current account. Without any exception, Turkey had trade deficits in all of the years since 1987 and these deficits were always greater than the deficits in the current account balance. Current account balance had surpluses only in crises years of 1994, 1998 and 2001 where the lessening in the GDP decreases the imports for considerable amounts and narrows the trade deficit. Excessive increases in the trade deficits in 1993 and 2000 (74% and 125% respectively) have been perceived as dangerous from the foreign investor's perspective and provided base for the crises through increasing the risk premium and adversely effecting foreigner's willingness to pay. Net income component is another factor for affecting current account balance negatively. Although it has been always in deficit as that was the case for foreign trade, it has not had volatile structure when compared to trade deficits. Uygur (2004, p.5) explains this situation by NFA position; since Turkey is a debtor country in international markets, its net interest income is negative which constitutes the high amount of net income component of current account balance. It follows smooth pattern because capital inflows are not realized as high amounts and they react immediately to the interest rate movements by

countercyclical which stabilizes the interest payments. Net service income has been effective together with current transfers for decreasing the current account deficits especially for the last years. Net service income is mostly made up from tourism revenues but it does not seem to have an increasing trend. It can be argued that Turkey has not obtained the expected success in the tourism sector even though it had a great potential with its geographical advantages and natural beauties. Besides, in the next years net tourism revenues may not be high enough as it was in the past since the abolishment of visas are expected to effect net tourism revenues negatively (Turkish citizens were facing with more difficulties about visas when they go abroad rather than foreigners who come to Turkey). Current transfers look like as if it decreases after 2002 but this is mainly due to the change in its definition; worker's remittances has been started to be counted in tourism revenues since 2003.

Table 7.1

Current Account Balance of Turkey (Billion Dollars)

	Current Account	Trade Balance	Net Service	Net Income	Transfers
1987	-806	-3206	2162	-2085	2323
1988	1596	-1813	3833	-2513	2089
1989	938	-4190	4028	-2327	3427
1990	-2625	-9448	4966	-2508	4365
1991	250	-7290	5164	-2663	5039
1992	-974	-8076	5807	-2625	3920
1993	-6433	-14081	6740	-2744	3652
1994	2631	-4167	7052	-3264	3010
1995	-2339	-13152	9620	-3205	4398
1996	-2437	-10264	6657	-2927	4097
1997	-2638	-15048	10912	-3013	4511
1998	2000	-14038	13518	-2985	5505
1999	-925	-9771	7502	-3537	4881
2000	-9920	-22057	11375	-4002	4764
2001	3760	-3363	9136	-5000	2987
2002	-626	-6390	7885	-4554	2433
2003	-7515	-13489	10511	-5557	1020
2004	-14431	-22736	12797	-5609	1117
2005	-22198	-33080	15267	-5839	1454
2006	-32249	-41056	13555	-6656	1908
2007	-38434	-46852	13283	-7108	2243
2008	-41959	-53021	17311	-8362	2113
2009	-13991	-24850	16749	-8189	2299
2010	-48528	-56316	14270	-7819	1337

Source: CBRT, Balance of Payments Analytical Presentation.

To sum up, it can be argued that the current account deficits of Turkey are mainly the result of foreign trade deficits rather than anything else. These kinds of deficits are more dangerous in terms of sustainability and more open to debate about balance of payment crises since they indicate structural weaknesses in international trade and competitiveness. These are permanent problems and cannot be solved easily since changing the production process and technological level of firms require long term planning and investments in education, infrastructure, research and development. For these reasons, analyzing the composition of foreign trade and evolution of trade deficits will be beneficial in order to understand the causes of deficits and structural problems before suggesting policy choices.

Turkey imports particularly investment and intermediate goods while exporting final consumption goods. For the last two decades; 7 percent of Exports of Turkey was made up by investment goods, 44 percent was made up by intermediate goods and 48 percent was made up by consumption goods whereas 19 percent of Imports of Turkey was made up by investment goods, 70 percent was made up by intermediate goods and 10 percent was made up by consumption goods. Hence, current account deficit can be considered as a structural problem; exports largely depend on imported goods. There are some recoveries in these rates in terms of improvements in the structural base; weights of categories have been changing against the consumption goods for the intermediate goods in exports whereas the situation is vice versa in imports. However, those can be considered as negligible. As it is expected from the above rates that foreign trade has been always in deficit for intermediate and investment goods while it had surpluses for consumption goods. Deficits in the intermediate goods were evolved from the 14 billion dollars average in 1990s to 48,5 billion dollars average in 2000s through reaching its top level to 75 billion dollars in 2010. Deficits in the investment goods were evolved from the 6 billion dollars average in 1990s to 10,5 billion dollars average in 2000s through reaching its top level to 17 billion dollars in 2010. Surpluses in the consumption goods were evolved from the 7 billion dollars average in 1990s to 18 billion dollars average in 2000s through reaching its top level to 25 billion dollars in 2007.

From the above mentioned realizations about the foreign trade of the Turkish Economy, it can be argued confidently that there is interdependence between exports and imports since Turkey mostly exports final consumption goods whereas it imports intermediate goods. When the industries are ordered according to their volume of exports, it can bee seen that top exporters are generally the top importers at the same time. This dependence can also be clarified by the input – output tables. Effect of the unit increase in final demand on the imported input requirement of the industries is calculated as the sum of the columns of inverted import matrix. Until now, TURKSTAT has published input – output tables for Turkish economy in 1973, 1979, 1985, 1990, 1996, 1998 and 2002. In table 7.2, some of the researches about the imported input requirements of industries, which have used the last published input – output tables 1998, 1998 and 2002 respectively, were presented to understand the import dependence of the production in Turkish economy. If TURKSTAT had published up-to-date input – output tables, it would be more beneficial to understand the current position of the industries in terms of the dependence on imports. However, the last published one is belonged to 2002. The differences in the coefficients for the first two researches have emerged from the different definition and coverage of the industries. In the last research presented in the table, coefficients seem to be significantly higher than the previous works which indicates that the dependence of the production on the import is accelerating. This picture supports the view that current account deficit is mainly the result of growth rather than other determinants. For example, Turkey has to import the 25-27% (in 1998) or 37% (in 2002) of the final value of the shoe in order to be able to produce it. After stating the dependence of production to the import sector, Eşiyok (2008) also calculated two other indexes to show the dependence of exports to the imports. First one is the ratio of the imported inputs to the total inputs used in the production for some industries. According to his calculations, the ratio of the imported inputs to the total input requirements has been steadily increasing; average values for all industries were 7,4% in 1979, 13,6% in 1985, 16,7% in 1990, 22% in 1996 and 23,1% in 1998 input – output tables. Second one is the effect of the unit increase in final demand of exports on the imported input requirement of the industries. According to his

calculations, the ratio of the imported inputs to the exports has been modestly increasing; average values for all industries were 5,3% in 1979, 14,8% in 1985, 12,3% in 1990, 11,4% in 1996 and 15% in 1998 input – output tables.

Table 7.2

Coefficients of Imported Input Use in Some Selected Industries

	Yükseler and Türkan (2008)	Eşiyok (2008)	Ersungur, Ekinci and Takım (2011)
Food and beverages	0,11	-	0,29
Tobacco and its substitutes	0,15	0,16	0,35
Textile	0,20	-	0,34
Clothing	0,22	0,23	0,30
Leather and shoes	0,25	0,27	0,37
Furniture	0,30	-	0,37
Wood and articles of wood	0,14	0,16	0,32
Cork and articles of cork	0,20	0,21	0,44
Printed books and newspapers	0,19	0,16	0,43
Plastics and articles	0,30	0,37	0,39
Rubber and articles	0,30	0,21	0,22
Chemicals	0,30	0,35	0,61
Fuels and oils	0,24	0,24	0,43
Metals	0,35	0,39	0,53
Machinery and equipments	0,30	0,26	0,44
Railways or tramway locomotives	0,18	0,19	-
Vehicles other than railways	0,24	0,24	0,48
Ships, oats and floating structures	0,18	0,21	0,70
Pharmaceutical products	-	0,20	-
Iron and steel	-	0,36	-
Radio, Television and Telecommunications	0,29	-	0,57

"It is widely argued that current account deficit does not present a problem as long as it is financed. However, how and what conditions this deficit is financed is an important issue because a fast growing current account deficit, even if financed can cause fragility" (Ok, 2008, p.9). Composition of international financial obligations has strong influence on the ability of an economy to sustain its deficits. Equity financing such as FDI and portfolio investments do not require payments to investors and share the burden of negative shocks between the home country and international investors.

However, debt financing such as bonds and other loans require payments at specific dates and home country bears the whole burden of negative shocks (Milesi-Ferretti and Razin, 1996a). Thus, the lower the stream of payments that is required to international investors, the longer the country can run current account deficits.

The structure and composition of these financing alternatives are also important. In case of equity financing; FDI are more stable and have long term structure than portfolio investment and higher FDI can have positive impact on sustainability whereas excessive dependence on portfolio investment increases the potential of a crisis even though both FDI and portfolio investment increase current account deficits through transferring profits. Also, Shelburne (2009, p.93) argues that portfolio inflows tend to crowd out domestic investment while FDI tends to increase it. In case of debt financing; currency composition, interest rates and maturities determine the vulnerability of country. The higher the share of obligations in the country's own currency, the less vulnerable the country is to negative shocks such as exchange rate adjustments. Hence, a country that issues assets mostly in its own currency, at low interest rates and with a high share of equity can continue along its path of consumption and saving for longer than could a country that borrows in currencies other than its own, at high interest rates with a high share of debt. However, Suarez and Ghezzi (2000, p.5) argues that FDI can be an indicator of healthier current account deficit only if it is directed to the tradable sectors. "Both the debt and FDI exert similar pressures on the current account. Debt deteriorates future current accounts through interest payments, while FDI does it through profit remittances abroad." (2000, p.5).

Table 7.3

Financing of Current Account Deficit

	Current Account	Financial Account	Net FDI	Net Portfolio	Net Other Components
1987	-806	1891	106	282	1503
1988	1596	-958	354	1178	-2490
1989	938	780	663	1386	-1269
1990	-2625	4037	700	547	2790
1991	250	-2397	783	623	-3803
1992	-974	3648	779	2411	458
1993	-6433	8903	622	3917	4364
1994	2631	-4257	559	1158	-5974
1995	-2339	4565	772	237	3556
1996	-2437	5483	612	570	4301
1997	-2638	6969	554	1634	4781
1998	2000	-840	573	-6711	5298
1999	-925	4829	138	3429	1262
2000	-9920	9584	112	1022	8450
2001	3760	-14557	2855	-4515	-12897
2002	-626	1172	939	-593	826
2003	-7515	7192	1252	2465	3475
2004	-14431	17702	2005	8023	7674
2005	-22198	42660	8967	13437	20256
2006	-32249	42689	19261	7415	16013
2007	-38434	48700	19941	833	27926
2008	-41959	34558	16955	-5014	22617
2009	-13991	9758	6858	227	2673
2010	-48528	58957	7294	16126	35537

Source: CBRT, Balance of Payments Analytical Presentation.

Financing the current account deficit of Turkey for the last two decades is presented in table 7.3. First striking fact in the table is the over-financing of the current account deficits. Except for the deficits in the crises years of 1994, 1998 and 2001, surpluses in the financial account have been higher than the deficits in the current account. From the data in this table and detailed representations of current account balance by CBRT, it can be claimed that current account deficits of Turkey have been financed increasingly by FDI and long term credits (especially given to the private sector). The share of short term capital flows in total financing has been decreasing. Likewise, foreign exchange reserves of the Central Bank have come to a substantial amount, which can be stand for a safeguard against the sudden outflows. It was above 80 billion dollars at the end of the 2010 when compared to 6,9 billion dollars in 1994

and 18,9 billion dollars levels in 2001. However, financing the current account with FDI and long term credits does not warrant that the deficit will be infinitely sustainable. Furthermore, although Turkey had sound macroeconomic fundamentals and fiscal discipline in the last decade, capital inflows were mostly the result of ample global liquidity. These type of capital inflows, which Yan and Yang (2008, p.438) defines as 'push factors', is more likely to cause current account imbalances in the future. Also, after the huge public enterprises' privatization come to an end and together with 2008 world economic crisis, share of FDI in financing account was much lower than the previous couple of years while the share of portfolio investments sharply increased in 2010. This development has raised the concerns about the sustainability of the current account deficit in Turkey.

Table 7.4

Composition of Foreign Debt Stock

	Total Debt (Billion dollars)	Short Term Public (%)	Short Term Private (%)	Long Term Public (%)	Long Term Private (%)
1989	43879	0,02	0,11	0,83	0,04
1990	52377	0,02	0,17	0,78	0,04
1991	53623	0,02	0,15	0,78	0,05
1992	58595	0,02	0,20	0,72	0,06
1993	70512	0,01	0,25	0,66	0,08
1994	68705	0,01	0,15	0,74	0,10
1995	75948	0,02	0,19	0,70	0,10
1996	79299	0,01	0,20	0,65	0,13
1997	84356	0,01	0,20	0,59	0,20
1998	96351	0,03	0,19	0,54	0,25
1999	103123	0,02	0,20	0,51	0,27
2000	118602	0,03	0,21	0,51	0,25
2001	113592	0,02	0,13	0,61	0,24
2002	129546	0,02	0,11	0,65	0,23
2003	144067	0,03	0,13	0,63	0,21
2004	160977	0,03	0,17	0,57	0,23
2005	169872	0,03	0,20	0,48	0,30
2006	207761	0,02	0,18	0,40	0,40
2007	249425	0,02	0,16	0,34	0,49
2008	280444	0,02	0,17	0,31	0,50
2009	268764	0,02	0,16	0,34	0,48
2010	290350	0,02	0,25	0,33	0,40

Source: CBRT, Foreign Debt Statistics.

"Countries that rely heavily on foreign financing are more prone to quick reversals in foreign investment and that these quick reversals can induce considerable pain like decreasing equity prices, low growth and a sharp depreciation" (Freund and Warnock, 2005, p.13). Vulnerability of the countries to the external shocks is generally measured by the ratios of the short term external debt to the total debt, to the reserves of the central bank or to the GDP. If the foreign debt stock (especially the short term debt) of a country increase, the rate of interest it has to pay is going to increase since its risk premium are considered to be high by the international investors. In the above table, it can be seen that the total foreign debt stock of Turkey has been continuously increasing with exceptions in the crises. However, the ratio of this debt to the GDP has become stable as a result of high growth rates obtained in the last decade. Also, it can be thought as more confident when compared to most of the developing countries in terms of the ratio of short term debt to the total and the ratio of public debt to the private debt. Again, as in the case of portfolio investment, rate of the short term debt of the private sector has sharply increased from 0,16 to 0,25 in 2010. This situation reminds the South Korea case in the Asian crisis in which local firms have borrowed from their own entities established in abroad. These have raised the concerns about the sustainability of the current account deficit in Turkey.

8. CONCLUSION

Many developing countries have experienced substantial and persistent current account deficits in recent years; this has raised the issue of sustainability and increased the volume of studies about the measures of sustainable current account deficits in the economic literature. Since the currency crises in Chile, Mexico, and Argentina are often associated with large and persistent current account deficits, researches are especially concentrated on the issue that whether the deficits result with a balance of payments crisis or not. Edwards (2001) provides empirical evidence that probability of a country experiencing currency crisis increase with large current account deficits. However, external imbalances need not to be end up with currency crisis. Kaminsky, Lizondo and Reinhart (1998) outline that in various studies carried out to explain financial crises; there is no single best indicator and a large number of explanatory indicators are used in the prediction of potential financial crisis. In this respect, some sustainability criteria for the current account deficits were developed and these were used as indicators for the crises.

Current account deficit as a ratio to GDP is a simple and commonly used method, which provides an opinion on the sustainability of the current account deficits. However, an evaluation based on this ratio may not always provide sufficient information on the sustainability of the current account deficits of a country since it ignores the specific characteristics of different economies. Different current account deficit to GDP ratios can be accepted as sustainable for different countries according to the financial and macroeconomic fundamentals of those countries. Thus, more comprehensive concepts have been proposed in the recent economics literature to evaluate whether the persistent current account deficits impose serious problems. These concepts are; solvency of foreign debt, excessiveness of the current account deficit and sustainability of the current account deficit.

Both solvency and excessiveness are empirical concepts for evaluating the current account deficits. Solvency is theoretically defined in relation to a country's present value of budget constraint, which is represented by foreign trade balance in general. "A country is solvent if its discounted value of the expected stock of foreign

debt in the infinitely distant future is non-positive." (Corsetti et al, 1998, 8). In the empirical part of this thesis, it was analyzed for Turkey through searching a cointegration between export and import to GDP ratios. Excessiveness was also checked by comparing actual and optimal current account balances derived from the real and theoretically predicted consumption patterns.

Sustainability is defined as a case where current economic policies can be maintained at the same time fulfilling the solvency condition (Milesi-Ferretti and Razin 1996b). In other words, the current account deficit of a country is sustainable if the continuation of the current macroeconomic policies in the future does not violate the solvency constraint. Hence, sustainability should not require any drastic shift in the economic policies or lead to crisis in order to ensure solvency. On the contrary, if the solvency criterion is obtained by a shift in the economic policies, then the current account deficit will be regarded as unsustainable. Thus, sustainability is a rather theoretical measure than the solvency and excessiveness criteria.

Evaluation of whether persistent current account deficits impose serious problems is related to the sustainability of the deficit rather than its absolute level or ratio to the GDP as it is stated above. Nevertheless, the dynamics of the economy, in which those current account deficits are produced, should be understood firstly in order to make judgments about sustainability. With this logic, macroeconomic determinants of the current account deficits in Turkey were investigated by Vector Auto Regression and Auto Regressive Distributed Lag models in lights of the theoretical arguments made about Turkish Economy. Then, sustainability of the current account deficit was analyzed by different empirical techniques associated with solvency and excessiveness concepts. In order to distinguish between sustainable and unsustainable periods for current account deficits, Markov Regime Switching model was used thereafter. Finally, sustainability of the current account deficits in Turkey was evaluated according to the macroeconomic fundamentals together with discussing the composition of current account deficit and the way of financing to have insights about the future path of current account balance.

According to the VAR results; persistency in the current account and inflation are most influential factors to determine the current account balance: Current account balance is affected mostly from its own values and inflation rather than anything else. 40% and 26% of the forecast error variance of the current account in twentieth quarter is caused by innovations in it's own past and inflation respectively. Current account balance is also influenced from the innovations in the growth, investment to GDP ratio, saving to GDP ratio, openness, oil prices, and reel exchange rate. Impulse response analysis shows that the impact of the GDP growth rate, investment, oil prices and real exchange rate are negative on the current account balance whereas the impact of inflation and saving are positive as expected theoretically. Also, there is an evidence for the persistency in the current account. Only the effect of openness seems to be ambiguous. These results were supportive for the theoretical considerations made for the Turkish Economy and its current account balance position for the last decades.

According to the ARDL results; impacts of growth, inflation and investment are higher than the other variables as in the VAR framework together with the effects of saving, openness, oil prices and real exchange rate are not significant and so small in magnitude that saving can be considered as negligible. Nevertheless, effect of saving on the current account balance seems to conflict with the theory as being negative in this framework. According to the estimates; when the growth rate of the economy increase 10 percent, current account deficit to GDP ratio increases 3 percent, when the investment rate increase 10 percent, current account deficit to GDP ratio decreases 2,2 percent, when the openness rate increase 10 percent, current account deficit to GDP ratio increases 0,35 percent, when the oil prices increase 10 percent, current account deficit to GDP ratio increases 0,34 percent, when the inflation rate increase 10 percent, current account deficit to GDP ratio decreases 1,8 percent and when the real exchange rate increase 10 percent, current account deficit to GDP ratio increases 0,49 percent. Evaluation of the coefficient of the Error Correction Term gives insights about the speed of adjustment mechanism; -0,231 means that any deviation in the current account balance is eliminated almost in a year.

According to the results for solvency criterion, it can be argued that the current account deficits of Turkey are only weakly sustainable. Even though the exports and imports have a long run relationship and move together (this relationship is approved by only one of two cointegration tests), exports seem to compensate only 72 percent of the imports which means that the foreign trade deficit of the country becomes larger and larger as time passes. Investigation of structural breaks in the variables separately results with two different time points; second quarter of 1998 for imports and first quarter of 2001 for exports. Even though the exports and imports have a long run relationship and move together with structural break in third quarter of 2000, exports seem to compensate 69 percent of the imports until the break whereas it only compensates 54,4 percent after 2000. This means that the path of unsustainable foreign trade become more dangerous after 2000.

According to the results for excessiveness criterion, cointegration relation between the cash flow and the final consumption expenditure for Turkey was found with consumption tilting parameter as 0,985. It denotes that Turkey is consuming more than the national cash flow which means the country is tilting consumption to the present. Investigation of structural breaks in the variables separately results with same year; first quarter of 2000 for cash flow and last quarter of 2000 for consumption. Even though the cash flow and the consumption series have a long run relationship and move together with structural breaks, cash flow seems to compensate 81 percent of the imports until the break in third quarter of 2001 whereas it only compensates 77 percent after 2001. This means that, the path of unsustainable consumption behavior become more and more excessive after 2001.

According to the MS results, the probabilities of persistency in the crisis, unsustainable and sustainable paths are 0,831, 0,865 and 0,696 respectively. Durations of crisis regime, unsustainable regime and sustainable regime are 5,9 quarters, and 7,4 quarters and 3,2 quarters respectively which indicates that economy can stay in the unsustainable path more than the sustainable one. Economic crisis that were realized in 1994 and 2001 can be explained well with the unsustainable path of current account balance. However, Turkey seems to be in a crisis regime since the first quarter of 2010.

This may be an informative alert for the Turkish economy about oncoming balance of payments crisis in a year.

In the theoretical discussion, growth has seemed to be leading factor for the current account deficits in Turkey by inducing more import demand since the dependence of export and production on the import was detected by foreign trade structures and input – output tables. Income elasticity of import is 2,24 which imply that as the economy grows, current account deficits are unavoidable. For this reason, investments in the sectors should be evaluated according to their backward and forward linkages. If the share of sectors that have strong domestic linkages with the others become high in the production, dependence of imported inputs can be decreased. Real exchange rate appreciation has not seemed as effective as growth. When it is computed according to efficiency and unit labor cost variables, it does not seem to appreciate much whereas current account balance had high amounts of deficits. Furthermore, imports of Turkey are made up mostly from intermediate goods rather than consumption goods which do not depend on exchange rate much since they are considered as necessary goods as a result of their contribution to the industrial production and growth of the economy. Thus, depreciation in the currency does not seem as an effective policy choice in the long run. However, appreciation of the Turkish Lira contributes to the cheapening of importation of intermediate goods against local production and make most of the producers import oriented. Also, accelerating oil prices cannot be denied for contribuition of the current account deficits. Thus, Turkey has to develop energy policies such as using its energy potential in natural resources efficiently like water, coal, lignite. Also, it has to differentiate its energy imports both in terms of country and products. When the fiscal discipline in the public sector in Turkey after 2001 crisis is taken into account, it will be seen that deterioration in the saving – investment balance was primarily the result of increase in private sector's investments. Private sector has realized the 81% of total investments after 2001 crisis in Turkey. Investment to GDP rate had an upward trend from 15% levels after 2001 crisis to 25% levels until 2008 crisis whereas saving had a more stable structure, which means that current account deficits has been appeared as a result of investment increase rather than consumption. Even though investment driven deficits were treated as more preferable in

the literature, they can still be dangerous if they do not directed to the foreign exchange generating capability trading sectors as in the Turkey case. Encouraging saving can be thought as a policy choice to decrease the deficits if the households and firms are agreed to tolerate slowdown in the growth. Increasing reserve requirements to lessen the credit expansion can be a solution only in the short run and gainful for postponing the possible crisis.

Composition of the current account balance has featured that trade deficits were higher than the current account deficits which were more dangerous about sustainability and more open to debate about balance of payment crises since they indicate structural weaknesses in international trade and competitiveness. It can be argued confidently that there is interdependence between exports and imports since Turkey mostly exports final consumption goods whereas it imports intermediate goods. When the industries are ordered according to their volume of exports, it can bee seen that top exporters are generally the top importers at the same time. When the subject comes to the financing, it has been seen that current account deficits were over-financing by the financial account surpluses through FDI and long term credits in increasing amounts. Also, when compared to most of the developing countries in terms of the ratio of short term debt to the total and the ratio of public debt to the private debt, Turkey has seemed to be in a better position. However, two developments after world economic crisis have raised the doubts about the sustainability of the current account deficits in Turkey; short term debt of the private sector has sharply increased and share of FDI in financing account was much lower than the previous couple of years against the portfolio investments in 2010.

Current account deficit is a permanent problem in Turkey and cannot be solved easily since changing the production process and technological level of firms require long term planning and investments. Turkey may going to be faced with a slow growth period in near future to eliminate the current account deficits by decreasing import and trade deficits smoothly, but the probability of a balance of payment crisis is still present as it was in the past.

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APPENDIX

A1: VAR Approach Results

Table A1

VAR Estimation Coefficients

	CA	GROWTH	D(INV)	DT(SAV)	D(OPEN)	OIL	INF	D(REER)
C	-0,019	0,034	-0,009	0,000	-0,002	0,154	-0,001	0,000
CA(-1)	0,426	-0,193	-0,060	0,012	0,173	-2,028	-0,430	-0,724
CA(-2)	0,152	0,405	-0,060	-0,012	-0,206	2,419	0,315	0,882
GROWTH(-1)	-0,099	-0,262	0,068	-0,114	0,114	0,133	0,032	0,226
GROWTH(-2)	-0,015	-0,101	0,004	0,130	-0,090	-0,265	0,316	0,715
D(INV(-1))	-0,260	0,292	0,063	-0,163	0,304	2,644	-0,369	-0,651
D(INV(-2))	0,174	-1,094	-0,060	0,131	0,773	-4,421	1,005	-1,346
DT(SAV(-1))	0,309	-0,520	0,050	0,703	0,216	0,961	0,580	-1,215
DT(SAV(-2))	-0,229	-0,067	-0,013	-0,165	-0,458	1,864	-0,489	1,907
D(OPEN(-1))	-0,213	0,237	0,034	0,108	-0,104	-2,210	-0,391	-0,069
D(OPEN(-2))	-0,175	0,038	-0,095	-0,118	0,005	-0,962	-0,186	0,628
OIL(-1)	-0,013	-0,019	0,009	-0,004	0,033	-0,189	-0,002	0,017
OIL(-2)	-0,035	-0,023	0,001	-0,014	0,050	-0,151	0,008	0,060
INF(-1)	0,066	0,122	0,050	-0,091	0,053	0,230	0,356	-0,190
INF(-2)	0,074	-0,151	-0,014	0,091	-0,015	-0,881	0,589	0,092
D(REER(-1))	-0,114	0,180	0,026	0,019	-0,123	-0,205	-0,274	-0,162
D(REER(-2))	-0,440	0,102	0,023	-0,034	0,057	-0,506	-0,073	-0,146

Table A2

Serial Correlation Lagrange Multiplier (LM Test) Results for Residuals of VAR

Lag	LM stat.	Prob.
1	66.07	0.405
2	84.15	0.046
3	61.37	0.569
4	79.92	0.086
5	55.86	0.755
6	55.17	0.776
7	41.22	0.988
8	82.27	0.061

Table A3

White Heteroskedasticity Test Results for Residuals of VAR

Chi Square	Prob.
2297.29	0.535

A2: ARDL Approach (Bound Test) Results

Table A4

Lag Length Selection for Bound Test in equation 27

K	1	2	3	4	5
Serial Correlation LM test (prob.)	0.64*	0.54*	0.31*	0.59*	0.05
AIC	-5.424	-5.435	-5.444	-5.332	-5.456**
SIC	-4.744**	-4.522	-4.294	-3.885	-3.824
HQ	-5.150**	-5.067	-4.981	-4.750	-4.800

* denotes rejection of the hypothesis of no serial correlation in the residual term with 5 level of significance.
**denotes optimal lag length selected by that criteria

Table A5

Long Run Coefficients (equation 28)

Variable	Coefficient	Std. Error	P value
Constant	0.060	0.049	0.225
CA(-1)	0.401	0.117	0.001
CA(-2)	-0.091	0.111	0.417
CA(-3)	0.181	0.110	0.105
CA(-4)	-0.119	0.117	0.315
CA(-5)	-0.028	0.099	0.778
GROWTH	-0.034	0.060	0.566
GROWTH(-1)	-0.110	0.054	0.047
GROWTH(-2)	-0.051	0.053	0.333
INV	-0.208	0.173	0.234
INV(-1)	-0.206	0.238	0.390
INV(-2)	0.115	0.254	0.652
INV(-3)	0.152	0.187	0.419
SAV	-0.003	0.112	0.976
OPEN	-0.023	0.020	0.261
OIL	0.007	0.010	0.431
OIL(-1)	-0.001	0.009	0.858
OIL(-2)	-0.027	0.009	0.003
INF	0.121	0.050	0.020
REER	-0.044	0.020	0.037
REER(-1)	-0.035	0.026	0.172
REER(-2)	0.049	0.022	0.031

Table A6

Diognastic Checks for the Long Run Estimation

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	0.460	0.632
Auto Regressive Conditional Heteroskedasticity (ARCH) Test	0.244	0.622
White Heteroskedasticity Test	1.464	0.124
Jarque-Bera	3.076	0.214
Ramsey RESET Test	0.910	0.343
R Squared	0.872	
Akaike	-5.355	

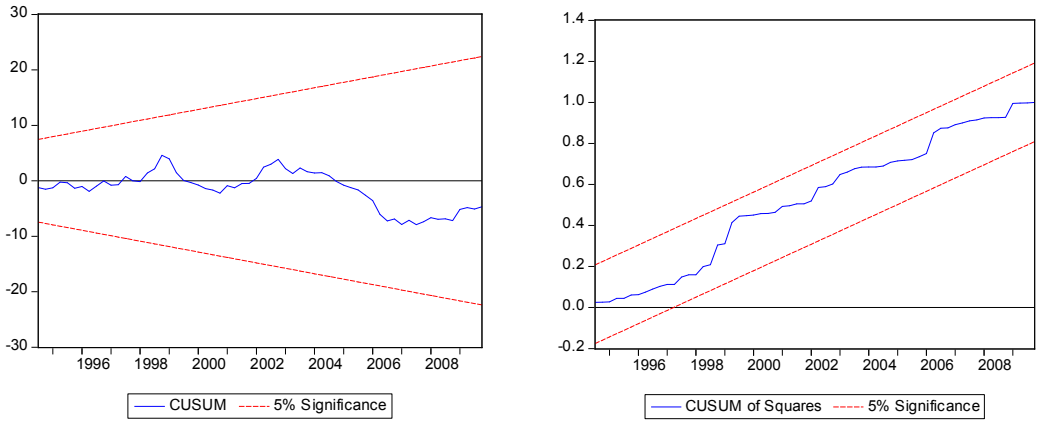


Figure A1: Parameter Stability in Dynamic Model

Table A7

Short Run Coefficients (equation 30)

Variable	Coefficient	Std. Error	P value
Constant	0.023	0.006	0.001
D(CA(-1))	-0.075	0.105	0.477
D(CA(-2))	-0.181	0.099	0.072
D(GROWTH)	-0.001	0.038	0.975
D(INV)	-0.006	0.169	0.969
D(INV(-1))	-0.286	0.159	0.076
D(SAV)	-0.013	0.131	0.920
D(OPEN)	-0.191	0.079	0.018
D(OIL)	0.014	0.007	0.066
D(OIL(-1))	0.020	0.007	0.009
D(INF)	0.179	0.048	0.000
D(INF(-1))	0.032	0.065	0.615
D(INF(-2))	0.006	0.056	0.905
D(INF(-3))	-0.015	0.039	0.697
D(REER)	-0.067	0.021	0.002
D(REER(-1))	-0.078	0.024	0.002
D(REER(-2))	-0.005	0.024	0.812
ECT(-1)	-0.231	0.073	0.002

Table A8

Diognastic Checks for the Short Run Estimation (equation 30)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	1.290	0.282
ARCH Test	0.788	0.377
White Heteroskedasticity Test	0.669	0.820
Jarque-Bera	3.735	0.154
Ramsey RESET Test	5.935	0.017
R Squared	0.595	
Akaike	-5.284	

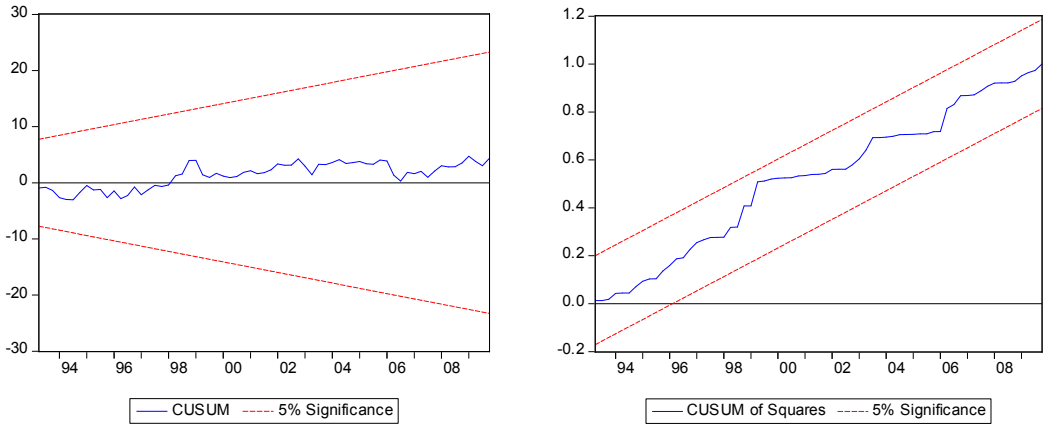


Figure A2: Parameter Stability in Short Run Model

A3: Solvency of Foreign Debt Results

Table A9

Diognastic Checks for the Foreign Trade Equation (equation 50)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	18.5	0.000
ARCH Test	2.492	0.119
White Heteroskedasticity Test	0.307	0.706
Jarque-Bera	3.663	0.160
Ramsey RESET Test	1.717	0.194
R Squared	0.865	
Akaike	-4.646	

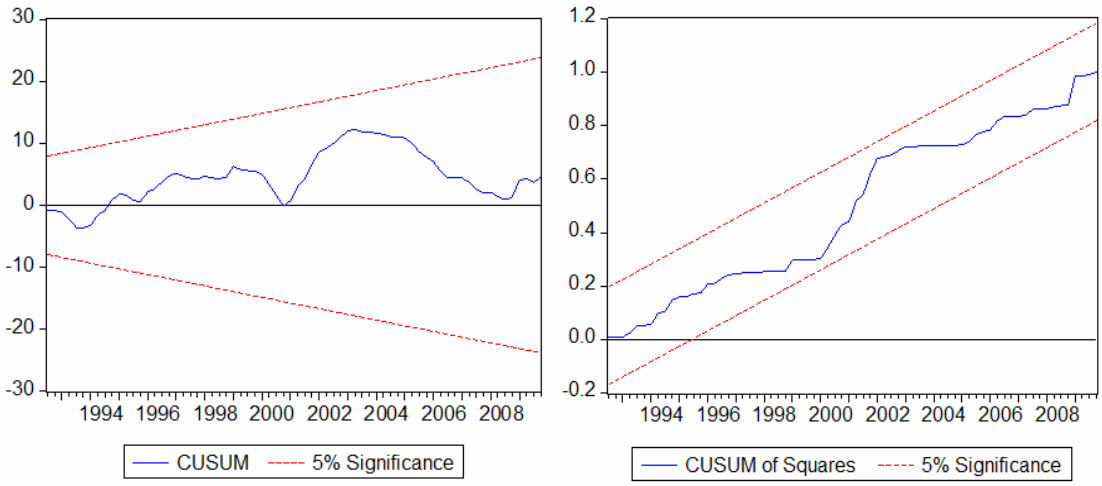


Figure A3: Parameter Stability in Foreign Trade Equation

Table A10

Diognastic Checks for the Foreign Trade Equation With Structural Break

(equation 53)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	6.62	0.000
ARCH Test	0.114	0.976
White Heteroskedasticity Test	0.267	0.929
Jarque-Bera	3.056	0.216
Ramsey RESET Test	0.081	0.776
R Squared	0.882	
Akaike	-4.726	

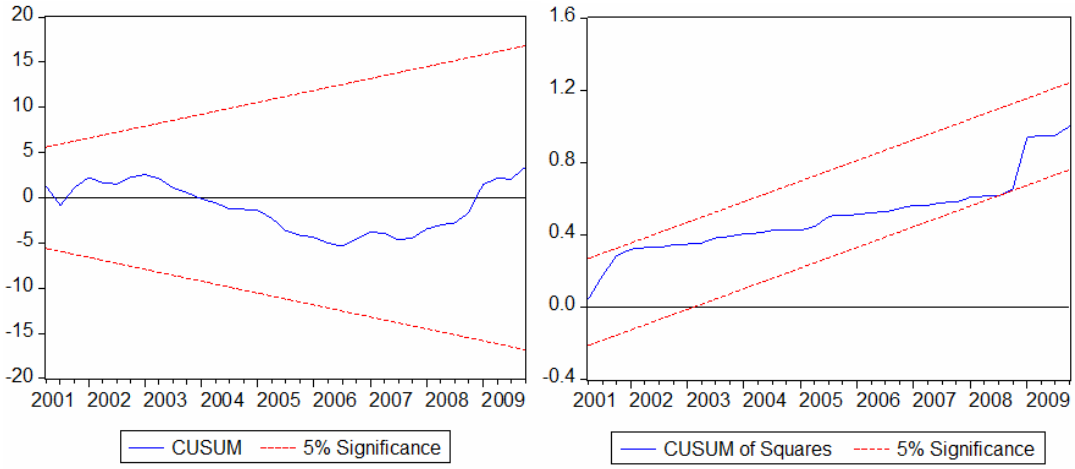


Figure A4: Parameter Stability in Foreign Trade Equation with Structural Break

A4: Excessiveness Results

Table A11

Diognastic Checks for the Consumption Smoothing Equation (equation 73)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	24.05	0.000
ARCH Test	10.11	0.000
White Heteroskedasticity Test	7.14	0.001
Jarque-Bera	3.300	0.191
Ramsey RESET Test	0.004	0.945
R Squared	0.936	
Akaike	17.111	

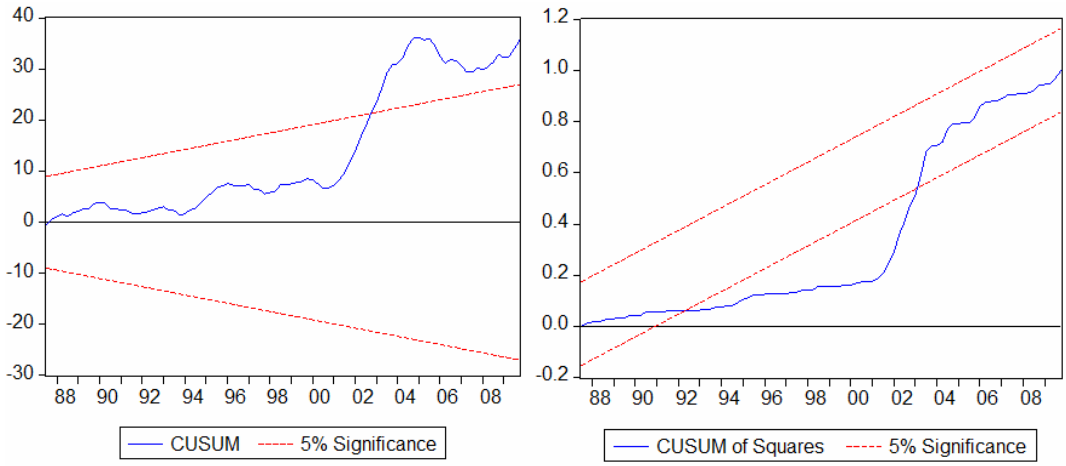


Figure A5: Parameter Stability in Consumption Smoothing Equation

Table A12

Diognastic Checks for the Consumption Smoothing Equation With Structural Break (equation 76)

TEST	Statistic	Probability
Breusch-Godfrey Serial Correlation LM Test	8.89	0.000
ARCH Test	4.072	0.002
White Heteroskedasticity Test	4.812	0.000
Jarque-Bera	2.588	0.274
Ramsey RESET Test	3.382	0.069
R Squared	0.965	
Akaike	16.535	

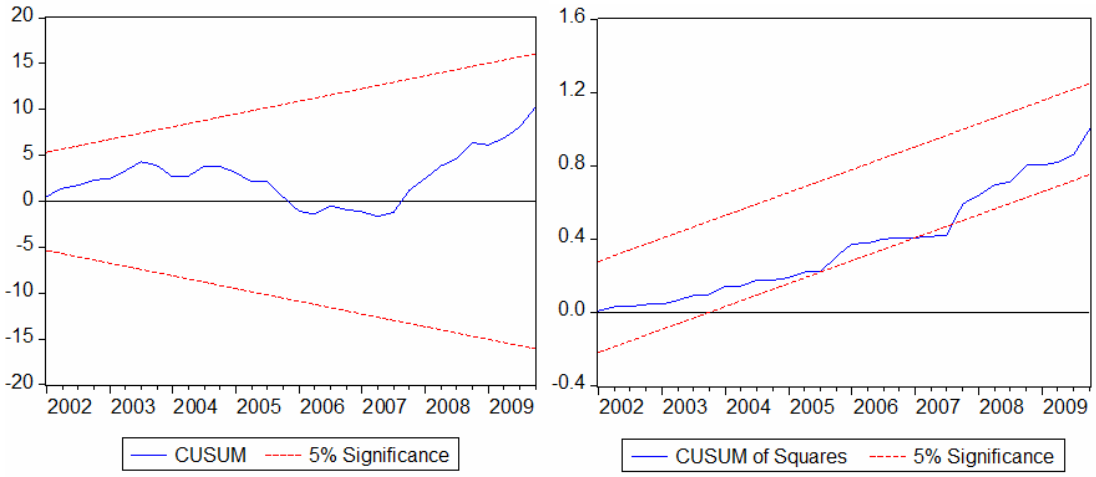


Figure A6: Parameter Stability in Consumption Smoothing Equation with Structural Break

Table A13

VAR Estimation Coefficients

	D(CASH)	CAACT
D(CASH(-1))	-0.561	-0.050
CAACT(-1)	-0.163	0.865

Table A14

Serial Correlation LM Test Results for Residuals of VAR

Lag	LM stat.	Prob.
1	5.95	0.20
2	16.75	0.00
3	12.07	0.01
4	38.09	0.00
5	7.79	0.09
6	12.18	0.01
7	6.57	0.16
8	37.86	0.00

Table A15

White Heteroskedasticity Test Results for Residuals of VAR

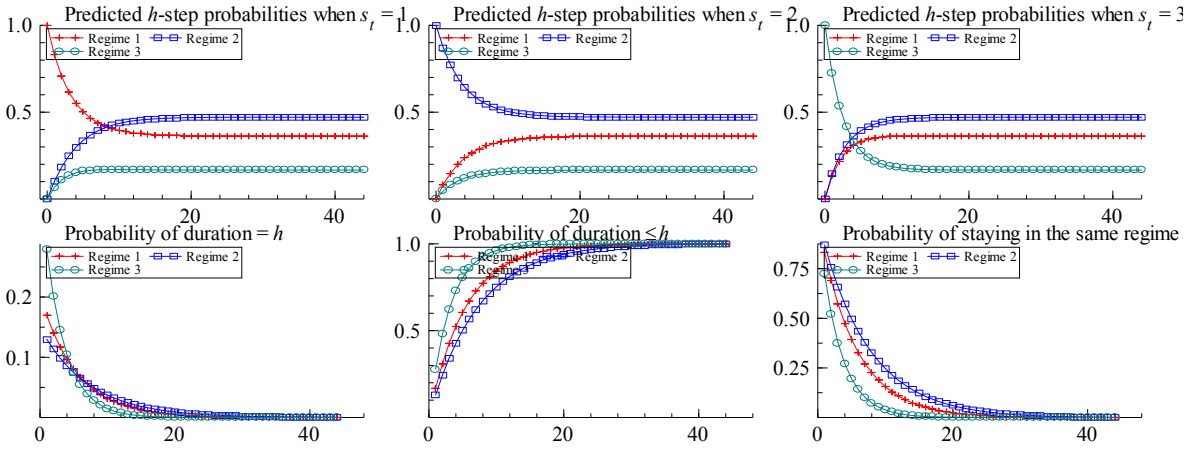
Chi Square	Prob.
18.15	0.11

A5: Markov Switching Model Results

Table A16

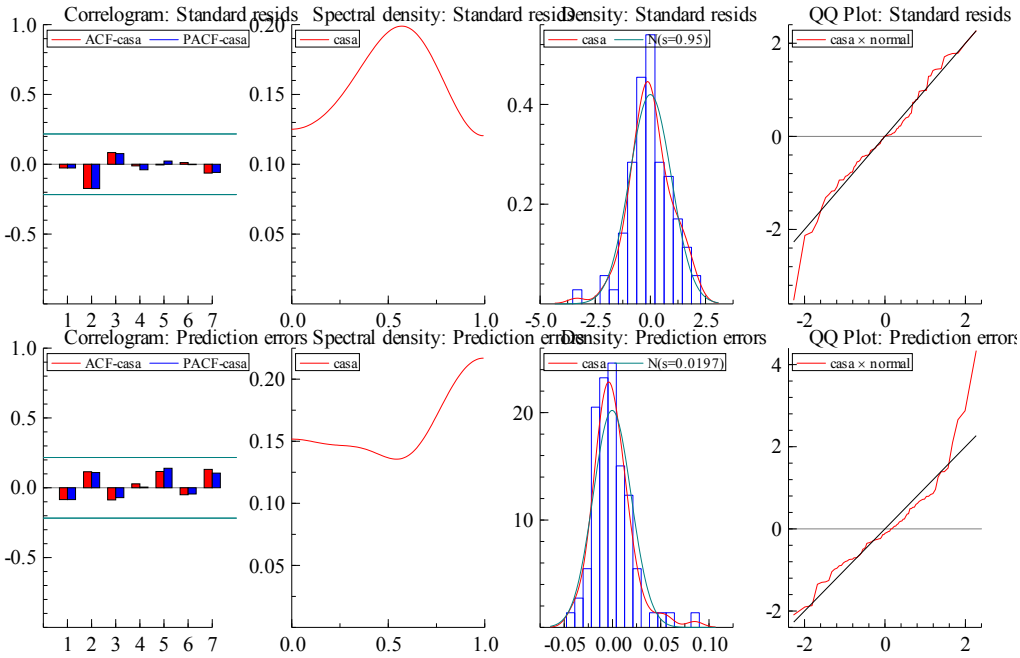
Diagnostic Checks for the Markov Switching Model

TEST	Statistic	Probability
Std. Residuals: portmanteau autocorrelation test	11.24	0.188
Std. Residuals: normality test	0.989	0.609
Std. Residuals: heteroskedasticity test	7.382	0.2496
Prediction Error: portmanteau autocorrelation test	36.21	0.000
Prediction Error: normality test	7.96	0.018
Prediction Error: heteroskedasticity test	6.65	0.573
AutoRegressive Error: portmanteau autocorrelation test	49.61	0.000
AutoRegressive Error: normality test	6.37	0.041
AutoRegressive Error: heteroskedasticity test	7.27	0.506



Figue A7: Predicted h Step Probabilites and

Probability of Staying in the Same Regime h Period Ahead



Figue A8: Standard Residuals and Prediction Errors