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DETERMINANTS OF CURRENT ACCOUNT BALANCE;

An Empirical Analysis for Developing Countries

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Abstract

This research analyzes one of the most important variables in the economics: “The current account balance”. The analyses were conducted by including some developing countries which are similar in terms of GDP and openness level. The aim of this research is to enlighten the roots of current account balance problems of developing countries and provide a better understanding in order to control and forecast it. In the beginning of the study, Turkey was selected as the basis between the developing countries and the others were selected as the proximity to Turkey according to given economic conditions. The selected countries through the conditions are Algeria, Bulgaria, Chile, Croatia, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Macedonia, Malaysia, Peru, Poland, Romania, Slovakia, South Africa, Thailand, Turkey and Uruguay. The final variables to be tested are determined after an election process as gross domestic product (GDP) growth rate, real interest rates, terms of trade, budget deficit, investment, openness level, inflation volatility, import coverage ratio, gross national savings (GNS).

The results indicate that the investment and GNS are the most critical determinants to control the current account balance; however, it also means that the current account balance mostly depends on the economic strategy of a country. For the actual year, there are statistical evidences indicating negative relationship of current account balance with GDP growth rate, investment and inflation volatility; on the other hand, the results illustrate positive relationship with terms of trade, import coverage ratio and GNS. For the lagged analysis, previous year current account balance and investment have positive relationship with current account balance, while real interest rates, terms of trade, budget balance, import coverage ratio and GNS have negative relations. Openness level has never revealed as significant in any cases of statistical analysis. Another outcome of the research is that Turkey is differentiating from the other developing countries only at the “terms of trade” determinant.

Keywords: Current account balance, determinants of current account, developing countries, panel data, Turkish economy.

Astratto

Questa ricerca analizza una delle variabili più importanti della economia “il saldo del conto corrente”. Le analisi hanno preso in considerazione i paesi in via di sviluppo che sono simili in termini di livelli di il prodotto interno lordo (PIL) e di livello di apertura. Lo scopo di questa ricerca è quello di far luce su quelli che sono gli attuali problemi di bilancio dei paesi in via di sviluppo e di fornirne una migliore comprensione, in modo da facilitarne il controllo e la previsione. Inizialmente, la Turchia è stata scelta come nazione di riferimento dello studio e gli altri paesi sono stati selezionati in termini di vicinanza alla Turchia rispetto a determinate condizioni economiche. I paesi selezionati sono: Algeria, Bulgaria, Cile, Croazia, Repubblica Ceca, Estonia, Ungheria, Lettonia, Lituania, Macedonia, Malesia, Perù, Polonia, Romania, Slovacchia, Sud Africa, Tailandia, Turchia e Uruguay. Le variabili finali da verificare sono state determinate attraverso un processo elettorale che ha preso in considerazione il PIL tasso di crescita, i tassi di interesse reali, le ragioni di scambio, il deficit di bilancio, gli investimenti, il livello di apertura, la volatilità dell'inflazione, il rapporto di copertura delle importazioni e il risparmio nazionale lordo (GNS).

I risultati indicano che gli investimento e il GNS sono le determinanti chiave per il controllo della bilancia delle partite correnti; tuttavia, significa anche che il saldo del conto corrente dipende in gran parte dalla strategia economica di un paese. Per l'anno in corso, ci sono evidenze statistiche che indicano una relazione negativa del saldo delle partite correnti con il tasso di crescita del PIL, gli investimenti e la volatilità dell'inflazione; d'altra parte, i risultati mostrano una relazione positiva con le ragioni di scambio, il rapporto di copertura delle importazioni e il GNS. Per l'analisi ritardata, il saldo del conto corrente dell' anno precedente e gli investimenti hanno evidenziato relazioni positive con il saldo delle partite correnti, mentre con i tassi di interesse reali, le ragioni di scambio, l'equilibrio di bilancio, il rapporto di copertura delle importazioni e il GNS hanno evidenziato relazioni negative. Il livello di apertura non si è mai rivelato come significativo nelle analisi statistiche. Un altro risultato della ricerca è che la Turchia sta differenziando dagli altri paesi in via di sviluppo solo rispetto alla determinante dei "termini di scambio".

Parole chiave: Saldo del conto corrente, determinanti del conto corrente, paese in via di sviluppo, pannello dei dati, economia turca.

1. Introduction

In the light of rapid developments from technological stages to the political stages, the world wants to understand its current situation and forecast its future better. Statistical science provides a great opportunity for more accurate and precise interpretations today. One of the most critical areas that a country wants to control and foresee is economics and economical modeling is highly important for every country. The dependencies are analyzed meticulously in the last decades and statistics is the most helpful tool to build new ideas.

This research analyzes one of the most important variables in the economics: “The current account balance”. The current account positions of countries, which are the fundamental part of balance of payments, has been one of the most outstanding indicators for the health of economies in globalized world because of the belief that especially, trade balances of countries indicate their competitive powers despite the hardness of interpretation. In order to interpret current account balance truly, the causes leading deficit or surplus in current account must be analyzed carefully. The primary reason for the necessity of the careful analysis is the different structures of countries’ current account balances. A deficit (surplus) in current account balance does not always required to be a negative (positive) sign for a national economy. On the other hand, this situation brings forward to sustainability concept of current account deficits since the higher deficit in current account increases the economic risk factors. Countries become riskier when the sustainability of large and persistent current account deficits are started to be discussed (Bitzis, Paleologos and Papazoglu, 2008).

The primary goal of this research is to determine most important indicators, which cause changes in current account balance with their signs and magnitudes, in order to provide better understanding for controlling and forecasting it.

There are some researches and approaches which investigate the different perspectives of current account balance for different countries. These approaches and researches constitute the base of expected results for comparison with our results.

The initial point of this research was to analyze the determinants for Turkish balance of payments where the current account deficit has become persistent by the years; however, the research has been extended to 20 countries which are similar to Turkey in terms of economic

conditions. This extension allows us to increase the reliability of results and in addition to that it provides an opportunity to analyze both the general determinants of current account balance with 20 countries and the individual determinants of Turkish current account balance. Thus, finding the most reliable model for the general effects of independent variables, Turkey's data was analyzed in depth to validate the analysis and to see the different and similar effects.

The data was acquired by using most reliable resources such as International Money Fund, World Bank and central banks of countries in the research. The statistical analysis part was completed by the help of "Stata" which is a very user-friendly statistical software. During the experimentation phase, numerous executions for different scenarios have been tested and the final list of variables and their effects were determined. The stationarity of variables and possible correlations between some variables were also checked for the consistency of the results.

This paper organized as follows: Section 1 provides introduction and explanations to the importance of the topic. Regarding the base point of research, section 2 was dedicated to the economic analysis of the Turkish economy and current account balance. Section 3 reviews the literature about the known approaches and determinants to the current account balance. Furthermore, section 4 summarizes the decisions about the parameters and data for the empirical analysis and discussion in section 5. Finally, section 6 concludes the gathered results and final model with the further proposals.

2. Literature Review

2.1. Evaluation of Turkish Economy over Years

Turkey is largely free-market economy where competency rules are considered, private sector is the pioneer, public is the regulatory, liberal trade policy is applied and goods and services are able to be freely traded between the corporate and individuals. According to IMF World Economic Outlook, Turkey is defined as an emerging Market (2014). However, CIA World Factbook places Turkey between developed countries. Moreover, Most of the economists and political scientists define Turkey as one of the newly industrialized countries (2014)

Turkish Republic also called “Modern Turkey” was founded in 1923 by the lead of Mustafa Kemal, who has the title Ataturk means “Father of the Turks.”

Turkish Economy is increasingly driven by industry and service sectors. Agriculture sector, which has been the locomotive of Turkish economy for long years, shares are reducing in the GDP composition of Turkey. However, agricultural products are still among the products such as textiles, motor vehicles, ships and other transportation equipment, construction materials, consumer electronics and home appliances that Turkey is considered as one of the leading producers.

Turkey is a founder member of the OECD since 1961 and G-20 major economies since 1999. It is also a partner of the EU Customs Union. The country is the 18th among the world in terms of nominal GDP while 16th GDP based on PPP valuation (World Bank, 2014).

Turkish ministry of economy announced a new medium term plan which sets some crucial targets to pursue the development of a country. According to following table of Economic Outlook (2015), Turkey is expecting some real improvements, especially in terms of GDP and current account balance.

Table 2. 1. *Medium term program, Ministry of Development*

	2013*	2014	2015	2016	2014
GDP (Billion \$, Current Prices)	822	810	850	907	971
GDP Per Capita (\$)	10.807	10.537	10.936	11.541	12.229
Real GDP Growth	4.1	4.0	4.0	5.0	5.0
Unemployment Rate (%)	9.0	9.6	9.5	9.2	9.1
Current Account Balance (Billion \$)	-65.1	-46.0	-46.0	-49.2	-50.7
Current Account Balance/GDP (%)	-7.9	-5.7	-5.4	-5.4	-5.2

In addition, Turkey has very high targets in terms of foreign merchandise trade which can soar the value of Turkey amazingly.

Table 2. 2. *Medium term trade forecast*

(Billion \$)	2013*	2014**	2015**	2016**	2017**	2023***
Exports	151.8	157.6	173.0	187.4	203.4	500.0
Imports	251.7	242.2	258.0	276.8	297.5	625.0
Volume of Trade	403.5	399.8	431.0	464.2	500.9	1125.0
Balance of Trade	-99.9	-84.5	-85.0	-89.4	-94.1	-125.0
Exports/Imports (%)	60.3	65.1	67.1	67.7	68.4	80.0

Source: Economic Outlook, (2015)

**Actual*

***Forecast: Medium Term Program, Ministry of Development, (2015-2017)*

****The Exports Strategy of Turkey for 2023*

However, it might be crucial to examine the composition of GDP by doing an economic analysis for a country. Changes in the composition over years are healthy indicators in a country's structural analysis to notice reforms and developments.

Two sectors contribute to the GDP around 91% in 2013. In last 10 years the share of service sector increased around 5% while the industry share shrunk 1% (Statista, 2015). In addition, Agricultural sectors protects 10% band; however, these rates were significantly different in Turkish history.

1980s are the years that an important structural transformation starts in the Turkey. The extreme reductions in the share of agriculture and increase of industry and service shares are the indicators of this transformation. The share of agriculture decreases from 25% to 9% between

the years 1980 – 2013 (Kepenek, 2012). The reasons of these structural changes will be analyzed in the historical examination part of Turkish economy over the years.

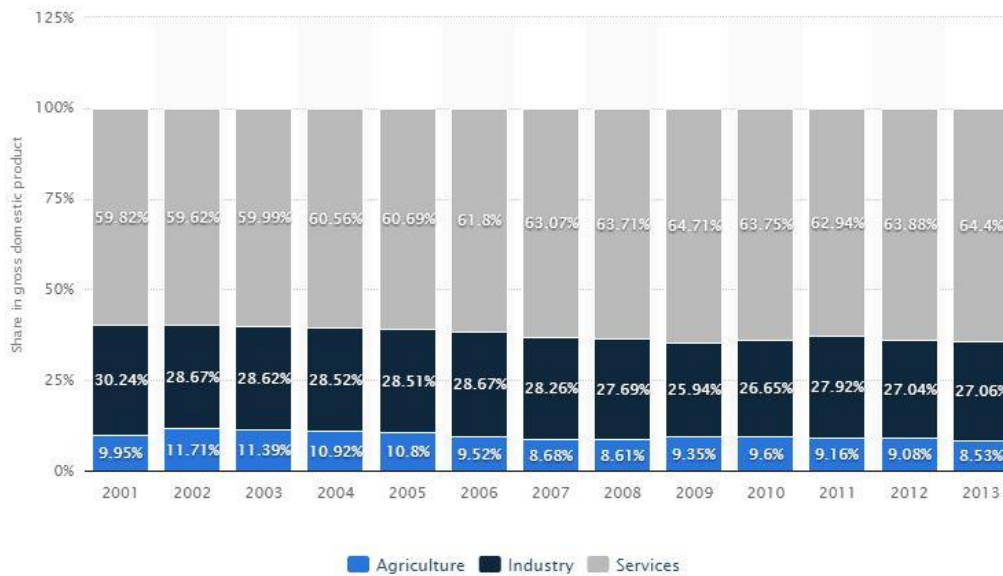


Figure 2. 1. *The composition of GDP by sectors in Turkey (Statista, 2015)*

Turkish republic was founded after the destructive World War I in 1923. From the beginning of foundation in 1923 to the recent days, there are some important financial periods which led to Turkish economy over years. It is possible to analyze these periods as 1923 - 1929 Liberal recovery, 1930 - 1939 Protective Statist Economy, 1940 - 1945 War Economy, 1946 - 1961 From Statist to Open Economy, 1962 - 1979 Import-Substitution Industrialization, 1980 - 1988 Export-Oriented Growth, 1989 - Recent Liberalization.

The intention of the research in the section to examine policies applied which had effects on the current account balance over years and the results of them.

2.1.1. 1923 - 1929 Liberal Recovery

This period comes just after the World War I that is why these years were the first steps of the Turkish economy’s recovery. Even though this period called as liberal, it does not mean that the government does not intervene into the economy directly. It could be said that the period was more liberal compared to previous stages (Kepenek, 2012). The Republic of Turkey has founded with a huge amount of debt from Ottoman Empire and with conditions of the Treaty of Lausanne.

Although the problem of capitulation had been solved by the agreement, there were still serious problems in terms of liabilities and custom conditions (Esiyok, 2006).

The war has damaged the agricultural production on a large scale, which was the most important income source of the country before, since most of the animals were used in the war and demographic structure changed in the country. In the beginning of the 1920s, Turkey had to import some substantial consumption matters such as flour, sugar and wheat. On the other hand, 80% of the export consists of 4-5 agricultural products. However, the reforms after the foundation of the Republic of Turkey have changed the pessimistic atmosphere and provided radical improvements in terms of both production and budget of Turkish economy.

These improvements provided the desired growth rates in all sectors and helped Turkey to turn back the situation before the World War.

Table 2. 3. *Growth, investment, foreign trade and sector shares (1923 – 1929) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/GNP	AGR./GNP	IND./GNP	SER./GNP
1923	n.d	n.d	n.d	n.d	7.5	-6.3	39.6	13.2	47.2
1924	14.8	27.2	-7.1	8.4	8.7	-2.5	47.4	9.8	42.8
1925	12.9	5.6	17.9	19.7	10.2	-2.9	47.8	9.5	42.7
1926	18.2	31.8	14.8	5.7	9.0	-2.5	49.4	9.9	40.7
1927	-12.8	-30.9	19.4	2.2	12.6	-3.1	40.9	12.6	46.5
1928	11.0	19.2	-0.6	7.3	12.6	-3.1	44.0	11.3	44.7
1929	21.6	42.6	3.8	6.6	12.1	-4.6	51.6	9.6	38.8
Avg.	11.0	15.9	8.0	8.3	10.4	-3.6	45.8	10.8	43.3

Source: (Esiyok, 2006)

Besides the crucial developments in sectors and in total GDP, Turkish economy also started to provide surplus in actual government budget.

Table 2. 4. Actual budget with current prices (Million TL) (1923 - 1932)

Years	Actual Budget		Surplus (+), Deficit (-)
	Income	Costs	
1923	111.3	105.9	5.4
1924	138.4	131.6	6.8
1925	170.7	202.3	-31.6
1926	180.2	172.5	7.7
1927	201.6	199.1	2.5
1928	223.7	200.8	22.9
1929	224.2	212.8	11.4
1930	217.5	210.1	7.4
1931	185.5	207.5	-22.0
1932	214.4	212.0	2.4

Source: (Kepenek, 2012), Current Prices (Million TL) Turkish Economy p.39

The pleasing improvements in economy contributed to the recovery period of Turkish economy. It is possible to say the only unpleasant scenario of this period is in foreign trade. Although it is likely to mention that there are some improvements in foreign trade also, the first deficit in the current account has been seen in this period.

Table 2. 5. Foreign trade data with current prices (Million TL) (1923 - 1932)

Years	Export	Import	Balance	Export/Import (%)	Export (%GNP)	Import (%GNP)	Foreign Trade Volume
1923	85	145	-60	58.62	8.9	15.2	24.1
1924	159	194	-35	81.96	13.2	16.1	20.3
1925	192	241	-49	79.67	16.6	15.8	28.4
1926	187	235	-48	79.57	11.3	14.2	25.5
1927	158	211	-53	74.88	10.7	14.3	25.0
1928	173	223	-50	77.58	10.6	13.7	24.3
1929	155	256	-101	60.55	7.4	13.3	20.7
1930	151	147	4	102.72	9.6	9.3	18.9
1931	127	126	1	100.79	9.1	9.0	18.1
1932	101	86	15	117.44	8.6	7.3	15.9

Source: Kepenek, 2012 Turkish Economy, p.48

Current account balance must be carefully analyzed since it is probably one of the triggers of the fast growth of Turkish economy together with the usage of idle capacity caused by the war.

2.1.2. 1930 - 1939 Protective Statist Economy

The initiatives for industrialization by the channel of private sector have failed between the 1923 - 1929 years. The start of the payments for Ottoman Empire's liabilities and problems in the balance of payments were the main factors which led to failure for that initiative (Esiyok, 2006). However, another important reason to give up from industrialization efforts was the Great Recession which started in 1929. The Great Recession damaged to foreign trade all over the world and the countries, where the Republic of Turkey realized its limited export to, were among the countries who felt the effects of the crisis. Moreover, Turkey started to be financially straitened in terms of foreign currency. In order to sustain to provide the substantial consumption matters as cheap and easy, Turkey must have produced them domestically. Therefore, Turkey has begun to implement the principles of statist economy to cover itself against the destructive effects of the Great Recession.

The Statism can be defined as concentration of economic controls and planning in the hands of a highly centralized government often extending to government ownership of industry. In other words, Statism indicates relatively closed economy, which tries to industrialize and improve economy by internal resources. This policy became more successful in terms of industrialization compared to the previous period despite relatively smaller growth rate in GNP.

Table 2. 6. *Growth, investment, foreign trade and sector shares (1930 – 1939) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/GNP	AGR./GNP	IND./GNP	SER./GNP
1930	2.2	-3.9	12.7	7.2	12.0	0.3	45.5	11.1	43.4
1931	8.7	14.3	14.2	1.4	7.9	0.1	45.1	12.3	42.6
1932	-10.7	-28.8	17.8	3.9	8.8	1.2	39.9	13.8	46.3
1933	15.8	22.1	19.0	9.6	8.8	1.8	37.3	15.9	46.8
1934	6.0	2.7	13.8	6.6	10.2	0.6	34.1	17.6	48.3
1935	-3.0	-6.1	-0.1	-1.3	10.1	0.8	35.3	17.8	46.9
1936	23.2	54.1	-3.4	6.0	9.2	2.0	43.1	15.3	41.6
1937	1.5	-3.5	10.3	5.1	9.6	1.7	40.8	16.2	43.0
1938	9.5	5.4	15.7	12.1	11.3	-0.2	40.1	16.4	43.5
1939	6.9	3.8	16.7	6.9	10.6	0.4	39.0	18.0	43.0
Avg.	6.0	6.0	11.7	5.8	9.9	0.9	40.0	15.4	44.5

Source: (Esiyok, 2006)

As it is seen in the table, the industry growth rate has reached to 11.7% in this period, which is more than the previous period. One of the most important developments in this period has been seen in the current account balance. Current account balance started to provide surplus, which can be interpreted as dependency of Turkey to outside has become lower in this period. That is a result of cutting of foreign trade volume on a large scale.

Table 2. 7. Foreign trade data with current prices (Million TL) (1933 - 1939)

Years	Export	Import	Balance	Export/Import (%)	Foreign Trade Volume
1930	151.0	147.0	4.0	102.7	18.9
1931	127.0	126.0	1.0	100.8	18.1
1932	101.0	86.0	15.0	117.4	15.9
1933	96.2	74.7	21.5	128.8	15.0
1934	92.1	86.1	6.0	107.0	14.7
1935	95.8	88.8	7.0	107.9	14.1
1936	117.7	92.5	25.2	127.2	12.4
1937	138.0	114.4	23.6	120.6	14.0
1938	144.9	149.8	-4.9	96.7	15.6
1939	127.4	118.2	9.2	107.8	11.9

Source: Kepenek, 2012, Turkish Economy, p.76

In addition, actual budget performance of Turkish economy could be seen in table below. Except the years 1931, 1933 and 1939, it continued to provide surpluses in the fiscal balance.

Table 2. 8. Actual budget with current prices (Million TL) (1930 - 1939)

Years	Actual Budget		Surplus (+), Deficit (-)
	Income	Costs	
1930	217.5	210.1	7.4
1931	185.5	207.5	-22.0
1932	214.4	212.0	2.4
1933	198.9	205.4	-6.5
1934	241.2	228.8	12.4
1935	266.8	259.5	7.3
1936	270.8	265.8	5.0
1937	317.0	310.7	6.3
1938	329.3	314.7	14.6
1939	388.3	394.4	-6.1

Source: Kepenek, 2012, Turkish Economy, p.65

In the period of 1930 - 1939, Turkish economy managed to grow in all sector, 6% in agriculture and 5.8% in the service sector; however, the growth rate in the industry reached to 11.7%. It can be easily said that the policies in this period provided advantages for industrialization and also these policies determined the direction of the Turkey for the future. It is possible to say that Turkey relatively managed the goals of a statist economy which are balancing the public revenues to the public expenditures and limiting the import in order to have a surplus in trade.

2.1.3. 1940 - 1945 War Economy

The years 1940 - 1945 are named as the war years for the Turkish economy. Although Turkey was not one of the active countries in the World War II, the massive share of the sources have spent to the army (Esiyok, 2006). As it is mentioned above, in the statist period, Turkey managed a good industrialization process, however, in 1940s, the capital stocks were not in the desired level and this started the stagnation period because of the separation of sources to the military expenditures.

The war years damaged to Turkish economy even though it is not a part of the World War II since the war years brought the scarcity and the protective policies with. The devastation of the war can be seen clearly in the table below.

Table 2. 9. *Growth, investment, foreign trade and sector shares (1940 – 1945) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/GNP	AGR./GNP	IND./GNP	SER/GNP
1940	-4.9	-1.2	-10.2	-6.8	10.0	1.7	38.5	18.6	42.9
1941	-10.3	-16.5	-2.4	-6.4	9.1	1.6	37.0	19.3	43.7
1942	-5.6	19.4	-2.5	5.0	7.6	0.3	51.2	13.3	35.5
1943	-9.8	-12.5	-1.4	-9.6	9.8	0.6	56.5	10.7	32.8
1944	-5.1	-10.7	-6.1	2.2	9.6	1.0	44.1	15.4	40.5
1945	-15.3	-23.4	-16.6	-6.3	11.2	1.7	38.3	16.1	45.6
Avg.	-6.6	-7.5	-6.5	-5.3	9.6	1.2	44.3	15.6	40.2

Source: (Esiyok, 2006)

The table indicates massive shrinkages for the national income in the war years except the year 1942. However, the shrinkages in the agricultural and industry sectors are very frightening. In the statist economy years, Turkish industry grew by 11.4% on average, but in the war years, it shrank by 6.5%.

On the other hand, the war years caused the protective policies in terms of government budget and foreign trade. The prints of the statist economy have been pursued also in these years in order to limit the worst effects of the war.

Table 2. 10. *Actual budget with current prices (Million TL) (1940 - 1945)*

Years	Actual Budget		Surplus (+), Deficit (-)
	Income	Costs	
1940	552.2	546.5	5.7
1941	652.4	586.4	66.0
1942	983.8	918.5	6.3
1943	1038.5	1037.2	1.3
1944	1079.2	1083.0	-3.8
1945	664.0	605.0	59.0

Source: Kepenek, 2012, Turkish Economy, p.65

Although the national production decreased on a large scale, Turkish economy pursued to provide surplus in terms of fiscal balance. This trend also continued for the current account balance.

Table 2. 11. *Foreign trade data with current prices (Million TL) (1940 - 1945)*

Years	Export	Import	Balance	Export/Import (%)	Foreign Trade Volume
1940	111.4	68.9	42.5	161.7	7.5
1941	123.1	74.8	48.3	164.6	6.6
1942	165.0	147.7	17.3	111.7	5.0
1943	257.2	203.0	54.2	126.7	5.0
1944	232.5	164.9	67.6	141.0	5.9
1945	218.9	126.2	92.7	173.5	6.3

Source: Kepenek, 2012, Turkish Economy, p.76

As it could be seen from the table, despite the effects of the World War II, the foreign trade has maintained to provide surplus. Nevertheless, the reason is so clear, Turkish government continued to the implementation of limitation policies on import. Both export and import have been affected by the war, but the reduction in the speed of import was faster than the exports. In other words, Turkish trade volume shrank in the war years compared to previous years as it is seen in the table and the biggest cause of this shrinkage was the import limitation.

2.1.4. 1946 - 1961 from Statist to Open Economy

Turkey started to seek new economic policies after the war years. As much as the internal factors, external factors also had an important role in these periods. Due to the outstanding precautions, private capital stocks increased sharply in the war years, these capitals were contributed by new sources in this period. This increment in the capital stocks caused to economic developments.

After the World War II, Turkey have left the relatively closed economy features which had been pursued for 16 years. After this year, Turkish economy became foreign capital and credit depended economy where the import increased sharply by removing the limitations and started to cause chronic current account deficits (Boratav, 2003). The reason of this perspective was not just about the economic situation of Turkey. The fundamental reason of Turkey's transformation to the foreign capital dependency according to the opinion of foreign capitalists was that Turkey can help the rebuilding of Europe by the production in agriculture and mining since Turkey was not one of the countries destroyed in the war (Kepenek, 2012). In order to implement this vision, Turkey became a part of Marshall Plan.

Table 2. 12. *Growth, investment, foreign trade and sector shares (1946 – 1961) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/GNP	AGR./GNP	IND./GNP	SER./GNP
1946	31.9	54.2	26.1	14.8	9.7	-6.6	45.5	14.9	39.5
1947	4.2	-11.7	5.8	21.8	9.9	-3.5	38.6	15.2	46.2
1948	15.9	35.6	7.0	2.3	9.3	-3.4	44.3	12.8	42.8
1949	-5.0	-13.5	-2.7	3.1	12.2	-7.3	40.4	13.1	46.5
1950	9.4	10.9	9.3	8.1	14.4	-5.9	40.9	13.1	45.9
1951	12.8	19.8	2.6	9.5	13.6	-4.9	43.4	11.9	44.6
1952	11.9	9.5	10.9	14.5	15.5	-5.8	42.5	11.8	45.7
1953	11.2	8.7	19.2	11.6	15.8	-6.1	41.5	12.7	45.8
1954	-3.0	-13.9	9.2	3.6	15.7	-2.5	36.8	14.3	48.9
1955	7.9	9.7	11.3	5.5	15.0	-2.7	37.5	17.7	47.8
1956	3.2	5.0	9.6	-0.3	13.4	-1.3	38.2	15.6	46.2
1957	7.8	6.5	10.7	7.9	13.1	-0.5	37.7	16.0	46.3
1958	4.5	9.2	5.6	0.4	12.5	-0.5	39.3	16.2	44.4
1959	4.1	0.3	3.6	7.6	12.5	-0.7	37.9	16.1	45.9
1960	3.4	2.3	0.4	5.4	13.4	-1.4	37.5	15.7	46.8
1961	2.0	-4.9	11.7	4.2	13.6	-3.0	35.0	17.2	47.8
Avg.	7.6	8.0	8.8	7.5	13.1	-3.5	39.8	14.5	45.7

Source: Esiyok, 2006

As the table shows, Turkish economy got over the effects of war years and restarted to its growth in terms of GNP and industrialization. All three industries grew more than the average of the years 1923 - 2004. However, this period is the beginning years of current account deficit problems for Turkey which is also the underlying cause of this research. Esiyok (2006) examines the 1946 - 1961 periods by dividing into two sub-period (1946 - 1953 and 1954 - 1961) and indicates the reasons under title of external problems and the IMF stability precautions.

Table 2. 13. Actual budget with current prices (Million TL) (1946 - 1961)

Years	Actual Budget		Surplus (+), Deficit (-)
	Income	Costs	
1946	1041.5	1018.9	22.6
1947	1615.0	1564.2	50.8
1948	1467.7	1401.8	65.9
1949	1628.2	1572.0	56.2
1950	1419.4	1467.4	-48.0
1951	1646.0	1580.5	65.5
1952	2235.8	2248.9	-13.1
1953	2272.1	2294.1	-22.0
1954	2390.8	2564.7	-173.9
1955	3148.4	3308.9	-160.5
1956	3304.8	3487.2	-182.4
1957	3966.6	4162.8	-196.2
1958	4822.1	4977.1	-155.0
1959	6385.8	6728.0	-342.2
1960	6933.3	7320.3	-387.0
1961	10933.8	11382.5	-448.7

Source: Kepenek, 2012, Turkish Economy, p.93

The table shows that the capitals increased outstandingly in this period. Turkish central bank had also a contribution in this capital's increment by complimentary money supply. A lot of Turkish companies were established in this period included the some biggest Turkish banks such as "Akbank" and "Yapı Kredi". In addition to the internal sources, as it is mentioned before, there were lots of external aids in order to support the development of Turkish economy. The USA was the leader of the aid packages for Turkey. However, this period is the root of the external debt and current account balance problems in Turkey.

Turkey implemented a devaluation in 1946 and it was the first in Turkish economy. The goal of this devaluation was to limit the import, where the price and quantity quotes were removed and to increase the export by decreasing the value of Turkish Lira. The details of the exchange rate effects will be examined in the further steps.

Table 2. 14. Foreign trade data with current prices (Million TL) (1946 - 1961)

Years	Export	Import	Balance	Export/Import (%)	Foreign Trade Volume
1946	432.1	223.9	208.2	193.0	9.6
1947	625.2	685.0	-59.8	91.3	17.4
1948	551.0	770.1	-219.1	71.5	13.9
1949	693.9	812.3	-118.4	85.4	16.6
1950	737.6	799.9	-62.3	92.2	15.9
1951	879.4	1125.8	-246.4	78.1	17.7
1952	1016.2	1556.6	-540.4	65.3	19.2
1953	1109.0	1491.1	-382.1	74.4	16.7
1954	937.8	1399.4	-461.6	67.0	14.3
1955	877.4	1393.4	-516.0	63.0	11.9
1956	854.0	1140.6	-286.6	74.9	9.5
1957	966.6	1112.0	-145.4	86.9	7.1
1958	692.4	882.3	-189.9	78.5	4.5
1959	990.6	1310.0	-319.4	75.6	5.3
1960	1721.2	2213.7	-492.5	77.8	8.4
1961	3120.7	4585.1	-1464.4	68.1	15.6

Source: Kepenek, 2012, Turkish Economy, p.119

As the table indicates, the devaluation was not enough to prevent current account deficits caused by the removal of the limitation on the import quotas. It worked as intended only in the year 1946 and provided surplus but the following years always have given a deficit in terms of current account.

2.1.5. 1962 - 1979 Import - Substitution Industrialization

Turkish economy encountered with the recession and the crisis in the balance of payments and this triggered the transition to the import-substitution industrialization (Esiyok, 2006). This period can be called as also the period of plans because Turkey decided to support industrialization by the planned domestic production instead of import-oriented economy.

This period can be divided into two subgroups as 1962 - 1976 and 1977 - 1979. The years 1962 - 1976 can be considered as the period of another fast industrialization after the 1930 - 1939 period, however, the second subgroup named as the crisis years again.

Table 2. 15. *Growth, investment, foreign trade and sector shares (1962 – 1976) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/ GNP	AGR./GNP	IND./GNP	SER./GNP
1962	6.2	5.0	3.5	8.0	13.7	-3.7	34.6	16.7	48.7
1963	9.7	9.6	12.0	8.9	13.1	-4.3	34.6	17.1	48.3
1964	4.1	-0.4	11.2	4.8	12.9	-1.6	33.1	18.2	48.6
1965	3.1	-3.9	9.5	5.6	12.9	-.3	30.9	19.4	49.8
1966	12.0	10.7	15.2	11.5	14.0	-2.2	30.5	19.9	49.6
1967	4.2	0.1	8.2	5.2	14.3	-1.4	29.3	20.7	50.0
1968	6.7	1.5	11.1	7.9	15.2	-1.4	33.0	17.1	49.8
1969	4.3	-1.4	12.0	5.4	15.3	-1.3	31.2	18.4	50.4
1970	4.4	2.8	-0.5	7.3	16.5	-1.9	30.7	17.5	51.7
1971	7.0	5.1	8.9	7.6	14.2	-2.9	30.2	17.8	52.0
1972	9.2	1.0	10.6	13.4	15.2	-3.1	27.9	18.1	54.0
1973	4.9	-8.1	12.0	9.2	16.8	-2.8	24.5	19.3	56.2
1974	3.3	6.2	7.1	0.7	17.7	-5.9	25.2	20.0	54.8
1975	6.1	3.0	9.1	6.4	20.2	-7.0	24.5	20.6	55.0
1976	9.0	6.9	8.9	10.0	21.4	-5.9	24.0	20.5	55.5
Avg.	6.3	2.5	9.3	7.5	15.6	-3.1	29.6	18.8	51.6

Source: Esiyok, 2006

The period indicated is named as the golden years of the Turkish industry. The annual growth rate average reached 9.3 which is over the normal average. This growth was fed by the current account deficit and capital stocks. After, Turkish economy started to feel the effects of 1973 petrol crisis. With the increment of the external debt, Turkey went into the crisis period in 1977.

Table 2. 16. *Growth, investment, foreign trade and sector shares (1977 – 1979) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/ GNP	AGR./GNP	IND./GNP	SER./GNP
1977	3.0	-2.1	6.6	3.9	27.2	-6.6	22.8	21.3	56.0
1978	1.2	2.7	3.1	-0.1	24.6	-3.5	23.1	21.7	55.2
1979	-0.5	-0.2	-5.0	1.1	21.5	-3.4	23.2	20.7	56.1
Avg.	1.2	0.1	1.6	1.6	24.5	-4.5	23.0	21.2	55.8

Source: Esiyok, 2006

Before the crisis period, Turkey borrowed unconsciously and had a serious debt burden which was around \$10 billion in 1977. This short-term debt merged with the increment of petrol prices and caused a crisis in Turkish economy. The growth in the previous period started to be shrunk and even regressed.

Table 2. 17. Foreign trade data with current prices (Million TL) (1962 - 1979)

Years	Export	Import	Balance	Export/Import (%)
1962	381.2	619.4	-238.3	61.5
1963	368.1	687.6	-319.5	53.5
1964	410.8	537.2	-126.5	76.5
1965	463.7	572.0	-108.2	81.1
1966	490.5	718.3	-227.8	68.3
1967	522.3	684.7	-162.3	76.3
1968	496.4	763.7	-267.2	65.0
1969	536.8	801.2	-264.4	67.0
1970	588.5	947.6	-359.1	62.1
1971	676.6	1170.8	-494.2	57.8
1972	885.0	1562.5	-677.6	56.6
1973	1317.1	2086.2	-769.1	63.1
1974	1532.2	3777.5	-2245.3	40.6
1975	1401.1	4738.6	-3337.5	29.6
1976	1960.2	5128.6	-3168.4	38.2
1977	1753.0	5796.3	-4043.3	30.2
1978	2288.2	4599.0	-2310.9	49.8
1979	2261.2	5069.4	-2808.2	44.6

Source: Turkstat, 2015

In this period, as it can be observed in the table, the current account deficit became an even larger problem for Turkish economy. Furthermore, external debt statistics indicated the necessity of new policies.

2.1.6. 1980 - 1988 Export-Oriented Growth

After the recession in 1960s, Turkey had started a new economic period called as planned economy. The expectation was to have a stable growth rate but in the late 70s, economy again was dragged to a recession. It is very unusual to have such a period in a planned economy. The main reason of contradiction is letting internal and external developments to lead economy instead of plans (Kepenek, 2012).

The crisis led Turkish government to change its economic policy. Turkey settled to implement export oriented growth and agreed to the 24 January decisions. With this program, Turkey's intention was to become a competitive country in terms of production costs. In this period in order to increase export, Turkey applied a variety of tools such as low wages (low internal demand), devaluation and incentives for export (Esiyok, 2006).

One of the most important tools was the low wages. It has three goals to reach:

1. Increase the profitability
2. Increase export by decreasing the cost of domestic production
3. Limit the internal demand in order to control inflation and increase the export of products which are not easy to sell due to the low wages (Kepenek, 2012).

In this period, the cost of export policy was paid by the employees and the agricultural sector. However, the investment rates and capital stock could not have reached to desired level.

Table 2. 18. *Growth, investment, foreign trade and sector shares (1980 – 1988) (%)*

Years	gr(GNP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GNP	(X-M)/ GNP	AGR./GNP	IND./GNP	SER/GNP
1980	-2.8	1.3	-3.6	-4.1	21.8	-7.3	24.2	20.5	55.4
1981	4.8	-1.8	9.9	5.8	19.8	-5.9	22.6	21.5	55.9
1982	3.1	3.3	5.1	2.3	19.2	-4.9	22.7	21.9	55.4
1983	4.2	-0.8	6.7	5.3	20.1	-5.8	21.6	22.4	56.0
1984	7.1	0.6	10.5	8.2	19.3	-6.1	20.3	23.1	56.6
1985	4.3	-0.3	6.5	5.0	20.1	-5.1	19.4	23.6	57.0
1986	6.8	3.6	13.1	5.2	22.8	-4.9	18.8	25.0	56.2
1987	9.8	0.4	9.2	13.2	24.6	-4.6	17.2	24.9	57.9
1988	1.5	8.0	2.1	-0.8	26.1	-2.9	18.3	25.1	56.7
Avg.	4.3	1.6	6.6	4.5	21.5	-5.3	20.6	23.1	56.3

Source: Esiyok, 2006

As a result, Turkish economy could not have reached to the Republic of Turkey's averages in terms of GNP, sector growth rates and continued to give deficit in current account.

Table 2. 19. Foreign trade data with current prices (Million TL) (1980 - 1988)

Years	Export	Import	Balance	Export/Import (%)
1980	2910.1	7909.4	-4999.2	36.8
1981	4702.9	8933.4	-4230.4	52.6
1982	5746.0	8842.7	-3096.7	65.0
1983	5727.8	9235.0	-3507.2	62.0
1984	7133.6	10757.0	-3623.4	66.3
1985	7958.0	11343.4	-3385.4	70.2
1986	7456.7	11104.8	-3648.0	67.1
1987	10190.0	14157.8	-3967.8	72.0
1988	11662.0	14335.4	-2673.4	81.4

Source: Kepenek, 2012, Turkish Economy, p.119

This period of the Turkish economy called as the transaction period to the liberalized economy. January 24 decisions were the first step of open economy.

2.1.7. 1989 - Recent Liberalization

In 1989, Turkey paced a new period with the new decision called as number 32nd. This rule removed all the limitations and controls on the incoming and outgoing financial capitals (Kepenek, 2012). In one year, Turkish Lira became fully convertible to the foreign currency.

Free capital movements were causing volatility in the foreign exchange reserves and this was damaging the general balance of the economy. Being opened to the capital movements so fast resulted in a crisis approximately every five years.

Table 2. 20. *Growth, investment, foreign trade and sector shares (1989 – 2013) (%)*

Year	gr(GDP)	gr(AGR.)	gr(IND.)	gr(SER.)	I/GDP	AGR./GDP	IND./GDP	SER./GDP
1989	0.3	-7.7	4.9	0.7	22.6	16.4	26.8	56.8
1990	9.3	7.0	9.3	9.9	23.7	17.0	25.0	58.0
1991	0.9	-0.6	2.9	0.5	22.4	14.6	25.2	60.2
1992	6.0	4.3	6.2	6.3	23.0	14.3	25.0	60.7
1993	8.0	-0.8	8.3	10.4	25.6	14.8	23.8	61.3
1994	-5.5	-0.6	-5.7	-6.6	20.8	14.8	25.7	59.5
1995	7.2	1.3	12.5	6.3	23.5	15.0	25.8	59.2
1996	7.0	4.6	6.8	7.7	22.0	15.9	24.2	59.9
1997	7.5	-2.2	10.2	8.6	22.3	13.6	24.2	62.2
1998	2.3	n.d	n.d	n.d	22.1	12.5	32.5	51.9
1999	-3.4	-5.7	-4.6	-1.3	19.1	10.5	30.2	57.1
2000	6.8	7.1	6.2	6.6	20.8	10.1	27.9	55.6
2001	-5.7	-7.9	-9.0	-1.0	15.1	8.8	26.8	58.5
2002	6.2	8.8	4.7	4.7	17.6	10.3	25.2	55.0
2003	5.3	-2.0	7.7	4.1	17.6	9.9	24.9	54.2
2004	9.4	2.8	11.6	9.8	19.4	9.5	24.7	54.3
2005	8.4	7.2	8.8	8.6	20.0	9.4	24.7	54.1
2006	6.9	1.4	10.2	7.1	22.1	8.3	24.8	55.0
2007	4.7	-6.7	5.8	6.4	21.1	7.6	24.8	57.0
2008	0.7	4.3	-1.3	2.3	21.8	7.6	24.4	57.9
2009	-4.8	3.6	-8.6	-1.8	14.9	8.3	22.9	59.6
2010	9.2	2.4	13.9	7.6	19.5	8.4	23.6	57.2
2011	8.8	6.1	10.0	8.8	23.6	8.0	24.4	56.3
2012	2.1	3.1	1.6	2.5	20.1	7.9	23.8	57.5
2013	4.1	3.5	4.1	5.5	20.6	7.4	23.6	57.6
1989-2013	4.1	1.4	4.9	4.7	20.8	11.2	25.4	57.5

Source: Turkstat, 2015 & IMF WEO, 2014

The table indicates that the Turkish economy grew 4.1% while the sectors except agriculture grew approximately same.

However, as it is mentioned, the free exchange policy boosted the import. Moreover, the increment in the import of intermediate goods due to the policy brought forward the current account problems.

Table 2. 21. Foreign trade data with current prices (Million TL) (1989 - 2013)

Years	Export	Import	Balance	Export/Import (%)
1989	11624.7	15792.1	-4167.5	73.6
1990	12959.3	22302.1	-9342.8	58.1
1991	13593.5	21047.0	-7453.6	64.6
1992	14714.6	22871.1	-8156.4	64.3
1993	15345.1	29428.4	-14083.3	52.1
1994	18105.9	23270.0	-5164.1	77.8
1995	21637.0	35709.0	-14072.0	60.6
1996	23224.5	43626.6	-20402.2	53.2
1997	26261.1	48558.7	-22297.6	54.1
1998	26974.0	45921.4	-18947.4	58.7
1999	26587.2	40671.3	-14084.0	65.4
2000	27774.9	54502.8	-26727.9	51.0
2001	31334.2	41399.1	-10064.9	75.7
2002	36059.1	51553.8	-15494.7	69.9
2003	47252.8	69339.7	-22086.9	68.1
2004	63167.2	97539.8	-34372.6	64.8
2005	73476.4	116774.2	-43297.7	62.9
2006	85534.7	139576.2	-54041.5	61.3
2007	107271.7	170062.7	-62791.0	63.1
2008	132027.2	201963.6	-69936.4	65.4
2009	102142.6	140928.4	-38785.8	72.5
2010	113883.2	185544.3	-71661.1	61.4
2011	134906.9	240841.7	-105934.8	56.0
2012	152461.7	236545.1	-84083.4	64.5
2013	151802.6	251661.3	-99858.6	60.3

Source: Turkstat, 2015

As a result of the economic periods' analysis of Turkey, it can be said that Turkish economy has passed through lots of different periods. During 90 years, Turkish economy encountered lots of problems and applied variety of precautions to solve these problems by changing economic policies very often. However, except the closed economy years, the economy almost always resulted in deficit in terms of current account balance. Especially, in the last liberalization years, current account deficit problems revived and caused damages in the economy.

The next part of this research will analyze some potential determinants of the current account deficit separately over the years in Turkey to provide better understanding of Turkish economy and keys for the empirical research.

2.2. Turkish Economy by the Macroeconomic Factors

2.2.1. External Debt (1995 -2013)

The ratio of external debt to the gross national income (GNI) is one of the most important financial indicators for a creditor of a country. Especially, the short-term external debt is a key determinant in terms of defining the risk premium of a country. High external debt ratios increase the risk premium which must be paid while borrowing. In other words, foreign creditors demand high interest rates from a country with high external debt ratios while lending (Erkilic, 2006).

As it is mentioned during the historical analysis of Turkey, Turkish economy started to be exposed high external debt ratios, especially after passing to the liberalization with short-term capital movements.

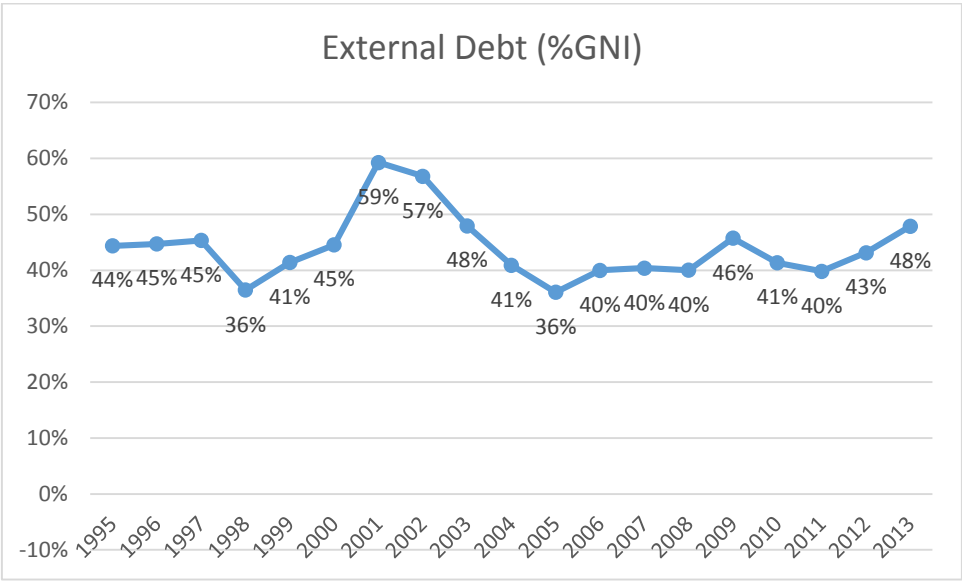


Figure 2. 2. External debt of Turkey (1995 - 2013), (World Bank, 2015)

This incremental trend continued in all liberalization period. After 1994, Turkish economy has started to implement the principles of fully free economy and the external debt rate soared to

44% one year after. According to the World Bank data, Turkey's external debt ratio to GNI reached to 60% in the year 2001 which was a very harmful date for Turkish economy.

External debt is very relevant to the current account deficit. Volatility in current account deficit can cause a deficit in the balance of savings and investment. These deficits are covered usually by selling of external assets or borrowing from external; however, the increase in external debt burden and outgoing capital can harm the sustainability of external debt and make the coverage of deficit by this method (Yucel and Yanar, 2005).

However, the short term external debts have more stable trend line compared to the total external debt (Central Bank of Turkey, 2015). That provides better signs in terms of repayment of external debts.

2.2.2. Real Exchange Rate

During the historical analysis of Turkish economy, it has been mentioned that the Turkish Lira have passed through different regimes according to the implemented policies. The most interesting situation in this table occurred during the formation of the new republic in 1923. The exchange regime was the free float which let on conservation of financial uniformity. After that, Turkey has adopted to the fixed regime in the statist period to control all kinds of activities depended on the exchange rate.

Table 2. 22. *Exchange rate regimes in Turkey*

Period	Exchange Rate Regime
1923-1930	Free Float
1931-1948	Fixed
1949-1980	Adjustable Peg
1980-1994	Crawling Peg
1994-1999	Managed Float
1999-2000	Tablita
2001-2001+	Free Float

Source: Gormez and Yilmaz,, 2007

One of the most important regimes has been implemented after 1980s. In this period, it is mentioned that Turkey adopted the exported oriented growth strategy which required the devaluation of Turkish Lira and the currency regime adjusted as crawling peg. Moreover,

Turkish Lira lost its value incredibly but the goal was the devaluation of currency in control to increase the export (Erkilic, 2006). Nevertheless, after the complete start of the liberalization period in 1994, Turkey adjusted currency regime to managed float and it resulted in appreciation of Turkish Lira. Unfortunately, this period did not last so long and 2001 crisis forced Turkey to abandon this regime. Implemented exchange rate regime until 2001, due to the triggering of political and economic conditions, must have been abandoned unexpectedly (Turel, 2004).

Free float exchange rate regime helped Turkish Lira to recover its wounds due to the crisis. Moreover, even the export increased despite the appreciation of Turkish Lira. The relationship can be explained by the effect of Turkish lira appreciation on the labor costs (Erkilic, 2006).

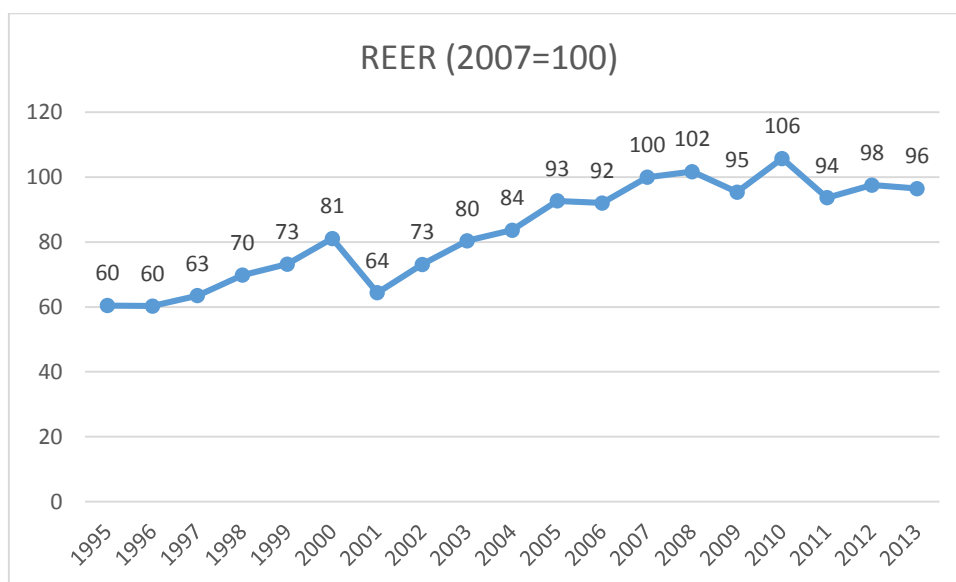


Figure 2. 3. Real effective exchange rate of Turkey (1995 - 2013) (Darvas, 2012)

Real effective exchange rate index (2007=100) shows that the depreciation and appreciation period of Turkish Lira with respect to the basis year 2007.

The exchange rate should be considered as a tool. The interferences to the exchange rate can harm the growth, current account and trade. Keeping the value of currency low intentionally in order to increase export does not improve the efficiency; moreover, it is ignoring the facts. (Ozatay, 2006).

2.2.3. Growth Rate

Growth rate of a country can be expressed as parallel to the GDP growth. In the historical analysis, the evolution of Turkish economy is given over the years. In this study, it will be focused on only the period that the current account deficit is examined.

GDP growth rates clearly indicate different periods of Turkish economy. The least GDP growth was seen in 2001 crisis while the highest growth was in 2010 as 9.2% in this period of Turkish economy.

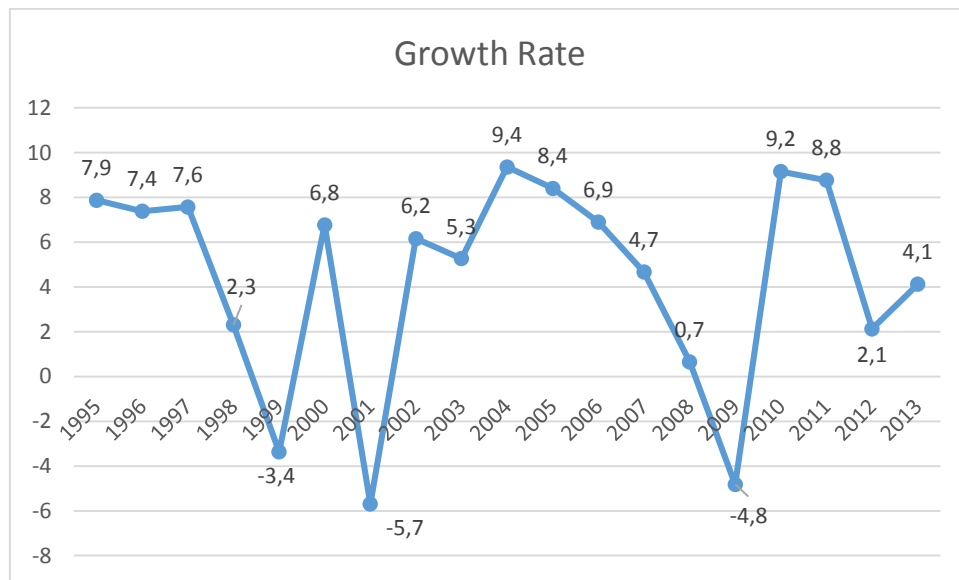


Figure 2. 4. GDP growth rates of Turkey (1995 - 2013) (World Bank, 2015)

From the graph, the average growth rate of economy during the years 1995 - 2013 can be calculated as 4.4%. Moreover, the growth rate of GDP per capita is also a crucial indicator which might be even more important than the GDP itself.

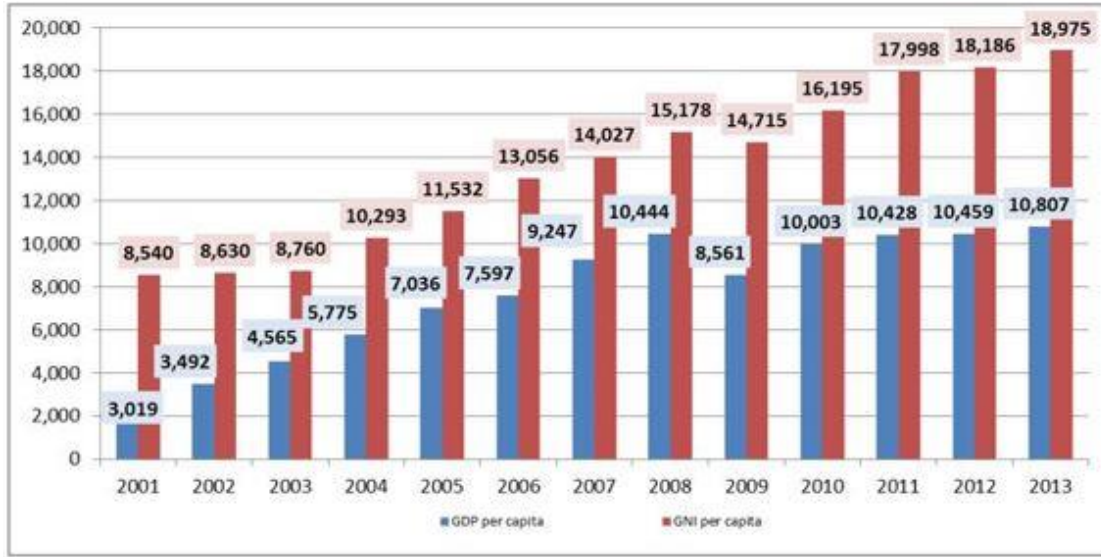


Figure 2. 5. GDP per capita and GNI per capita in Turkey (Economic Outlook, 2015)

According to the well-known economic sources of economy, further growth rate expectations in the GDP of Turkey and some selected countries are following:

Table 2. 23. Growth forecast for selected countries (%)

	Years	World	Turkey	Euro Area	US	China
IMF	2014	3.3	3.0	0.8	2.4	7.4
	2015	3.5	3.4	1.2	3.6	6.8
OECD	2014	3.3	3.0	0.8	2.2	7.3
	2015	4.0	3.2	1.4	3.1	7.0
WB	2014	2.6	3.1	0.8	2.4	7.4
	2015	3.0	3.5	1.1	3.2	7.1

Source: IMF, OECD and WB, 2015

2.2.4. Budget Deficit

The structure of public sector borrowing requirement changed after the beginning of 1990s (Erkilic, 2006). Until 1994, even the primary balance resulted in deficit in Turkey. After this year, Turkey started to cover primary expenditures with the interest revenues, but it did not prevent the necessity of more borrowing. Public sector, get into a loop which creates new deficits to cover the previous ones: it called as the debt-trap (Central Bank of Turkey, 1996).

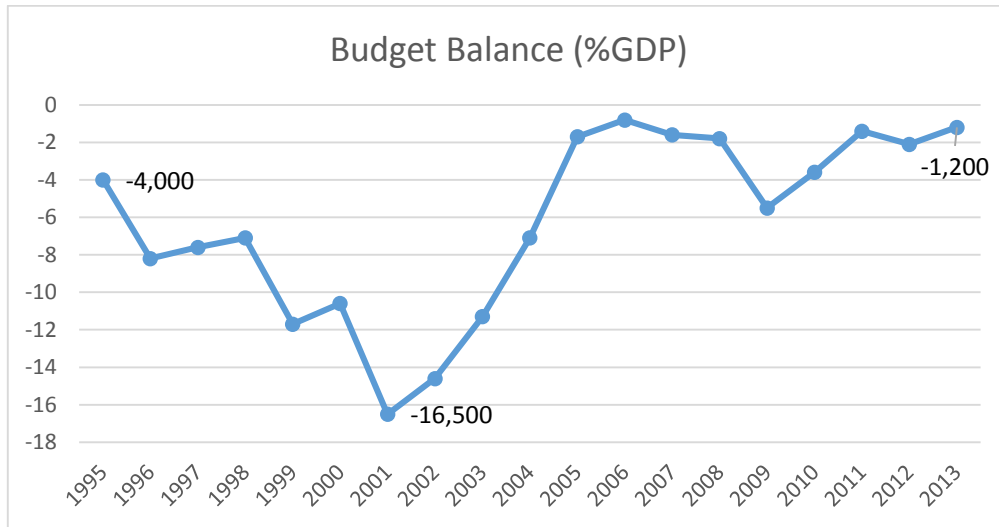


Figure 2. 6. Budget balance of Turkey (1995 - 2013) (World Bank, 2015)

The graph indicates that the Turkish economy have been spending more than its revenues since 1995 and chronically suffering from the current account deficit. This brings forward the concept of twin deficits hypothesis which means wider fiscal deficits usually trigger a larger current account deficit. Between the years 1995 - 2013, average budget deficit (% GDP) realized as -6.2%.

The figure below indicates the position of the budget deficit ratio of Turkish economy among selected countries, which gives us an opportunity to say that Turkey performed well in 2013 compared to some others.

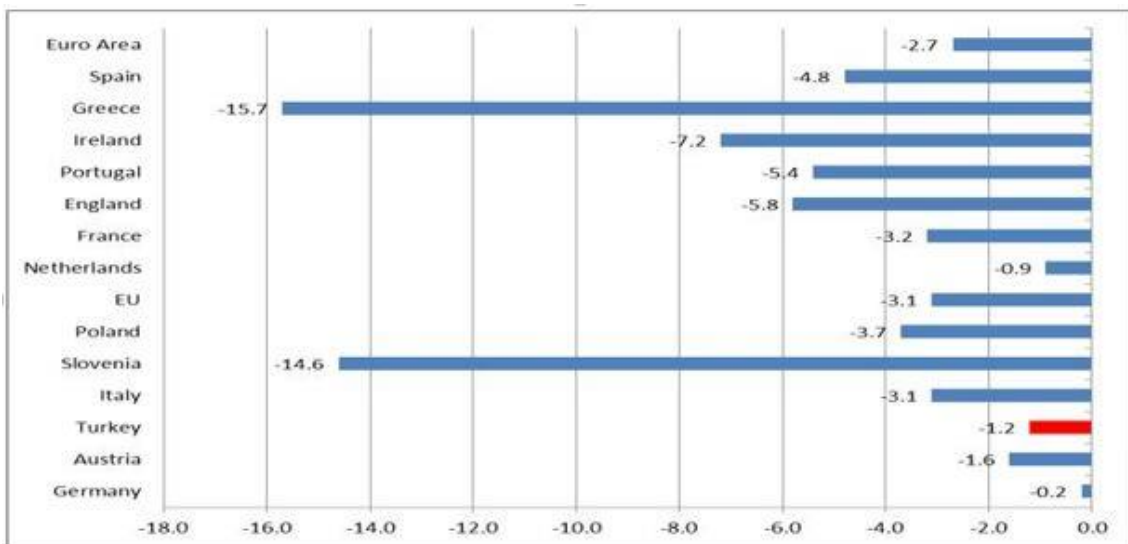


Figure 2. 7. Budget deficit ratios of selected countries (Economic Outlook, 2015)

2.2.5. Adequacy of Reserves

Total reserves are the assurance of countries against deficits in economy and comprise holdings of monetary gold, special drawing rights, reserves of IMF members held by the IMF and holdings of foreign exchange under the control of monetary authorities (World Bank, 2015). Reserves are important since they are the protector of countries to avoid the economic and financial crisis (Fischer, 2001).

The amount of total reserves alone is not sufficient to analyze the adequacy of reserves. That is why a lot of measurements are constituted in order to interpret the reserve adequacy. Most common criteria in terms of that is the reserves import coverage ratio. One common rule about the reserves' adequacy is that the reserves which cover minimum three months' worth of imports are considered as adequate (The Economist, 2010).

The necessity of reserve adequacy is important for all countries but particularly for the emerging markets, which are more open to volatility of international capital flows (Fischer, 2001). In other words, emerging countries are in trend of keeping ascending amount of reserves to protect their economies against internal and external shocks, to realize the external debt payments and to increase the trust for the country in the international markets (Central Bank of Turkey, 2005).

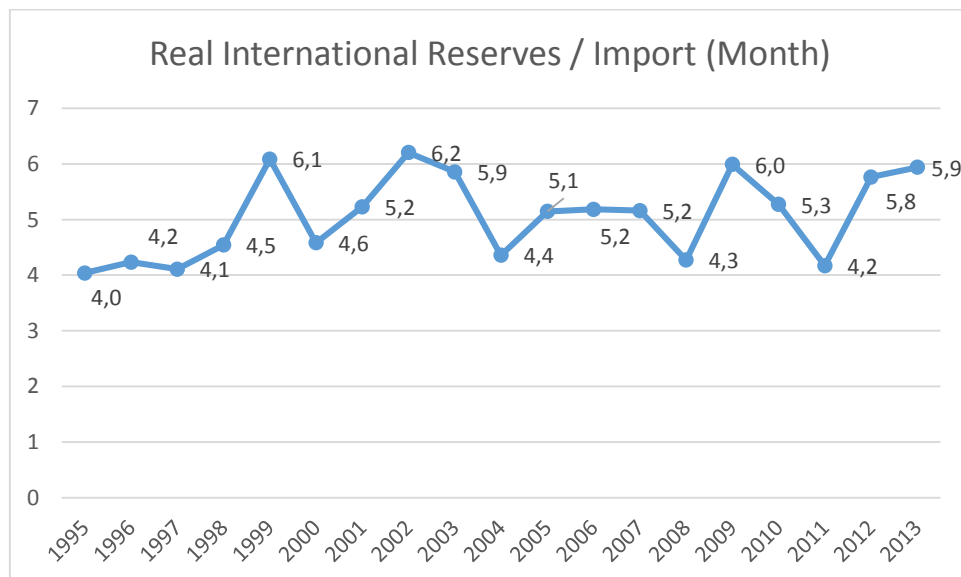


Figure 2. 8. Import coverage ratio (1995 - 2013) (Own calculations from IMF data)

As it is seen in the table, the Central Bank of Turkey is able to obey the minimum reserve coverage ratio in this period. However, Turkish Central Bank believes that this ratio should

cover the imports between 4 - 6 months, especially for emerging markets (Central Bank of Turkey, 2005). This measurement indicates that for how long a country can pursue its import amount without any dependence on external aids. According to this, Turkish economy can cover its import for about 5 months by only its own reserves which are in between the borders defined by Turkish Central Bank.

2.2.6. Inflation

With the simplest definition, inflation is the increase of the general level of prices in economy. When this happens, the wealth of people in a country decrease since money buys less. However, inflation might trigger the economic growth because if prices rise slowly and gradually, it forces consumers to buy now in order to avoid potential higher prices (Kimberly, 2014). This opinion also helps to explain why even the healthy economies should have a reasonable inflation rate.

It is possible to find three potential causes of inflation. Demand-pull inflation is one of the most common inflation types which means aggregate demand growth rate exceeds the growth rate of aggregate supply and pulls the higher prices (Kibritcioglu, 2002). The second one cost-push inflation pushes the prices higher when the costs of companies rise continuously as a result of unit costs (Kibritcioglu, 2002). The last reason can be the money supply. Money supply is considered as a tool of central banks but the excessive amount of the money supply can undervalue the money which can create a fact called as money illusion. Money illusion refers to a tendency to think in terms of nominal rather than real monetary values (Shafir, Diamond and Tversky, 1997).

Turkey is a country which suffered high and persistent inflation for years. If we ignore the years after 2004, average annual inflation rate is extremely high for Turkey.

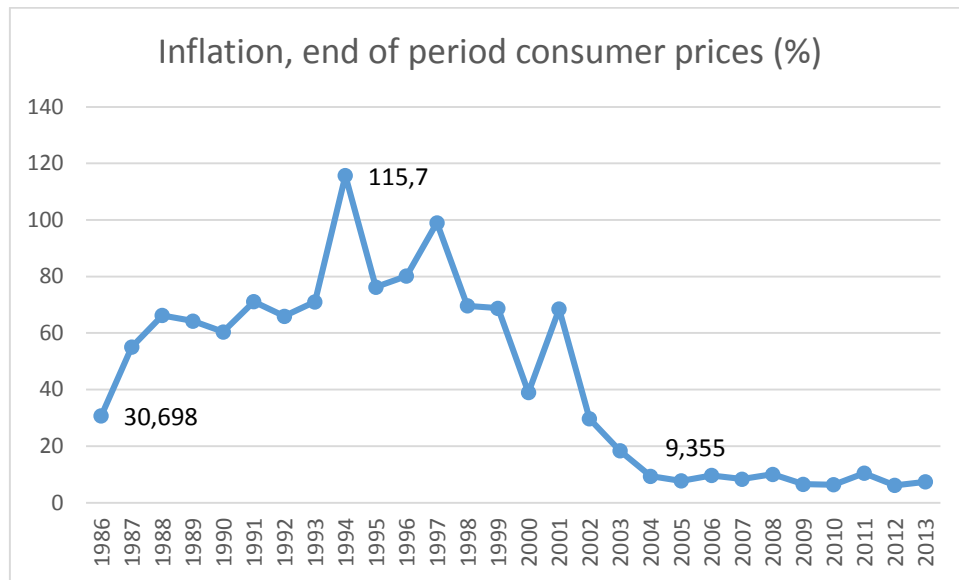


Figure 2. 9. *Inflation of Turkey (1995 - 2013) (IMF WEO, 2014)*

The first year under the double-digit inflation rate is 2004 with the percentage 9.3. Tunca (n.d) explains the cause of the high inflation rate of Turkey as demand-pull inflation. However, Kibritcioglu (2002) suggests wider reasons for Turkish high inflation rates:

- (1) High public sector budget deficits,
- (2) Monetization of public sector budget deficits,
- (3) Massive infrastructure investments of the various governments, such as for the Southeastern Anatolian Project,
- (4) High military expenditures associated with geopolitical reasons,
- (5) Political instability which results in inflationary pressures due to populist policies that have ensued prior to each general election,
- (6) Persistent inflationary expectations of economic agents,
- (7) Inflationary effects of changes in exchange rates via increases in prices of imported inputs,
- (8) Occasional increases in world prices of major imported inputs (particularly, crude-oil),
- (9) Increases in regulated prices of public sector products which are mainly used as input by the domestic private sector and/or
- (10) Rising interest rates resulting from the crowding-out effect of public sector borrowing in a shallow domestic capital market.

In addition to that, recent situation of inflation of Turkish economy in terms of both valid inflation criterion (CPI and PPI) can be seen the graph below.

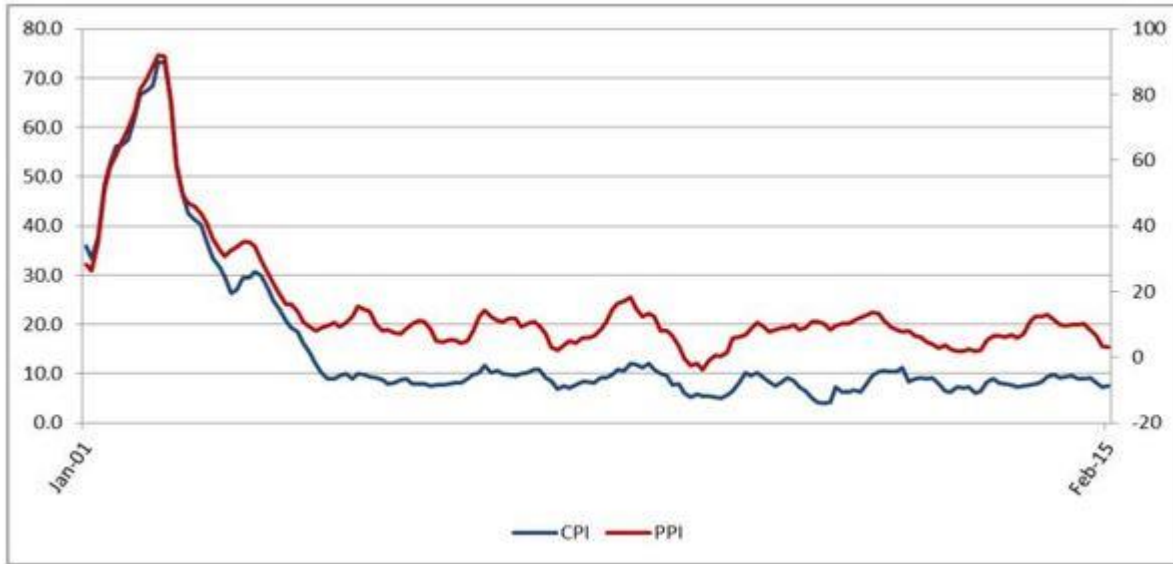


Figure 2. 10. Consumer and producer price index of Turkey (Economic Outlook, 2015)

2.2.7. Current Account Balance

The current account balance is the main subject of this research; therefore, it will be examined in detail in the further sections. In this section, it will be given only the main points about the current account balance of Turkey.

The line graph indicates that Turkish economy mostly gives deficits in terms of current account balance. The amount of the years with surplus is only 5 while the amount of the years with deficits is 29 in 34 years 1980 - 2013.

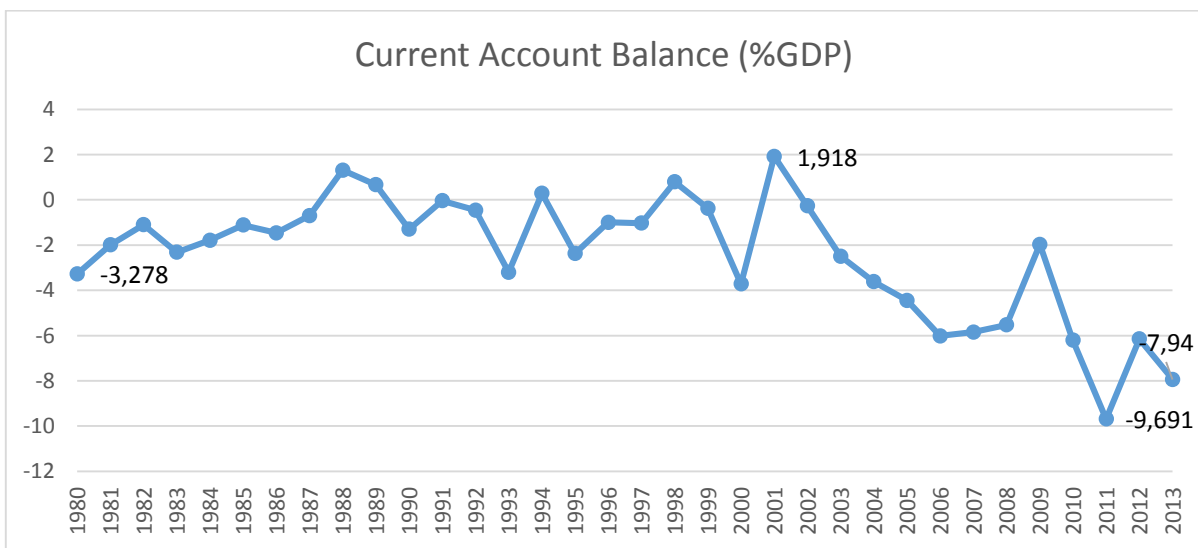


Figure 2. 11. Current account balance of Turkey (1995 - 2013) (IMF WEO, 2015)

Sometimes current account deficit had a correlation with the growth rate of a country. Due to the growth dependency on import, relatively high growth rates in Turkish economy usually occurred in the years with high current account deficits, while the years with the current account surplus encountered to the recession or crisis years (Erkilic, 2006). This situation supports the opinion that current account depends on the foreign trade, efficient and competitive capacity, short term capital movements and external factors as much as the real effective exchange rate (Turel, 2004).

2.3. General Information about the Current Account Deficit

All economic transactions that occurred in a specific timeframe between the residents of a home country and all other foreign countries are recorded as balance of payments. The subjects of these economic transactions can be individuals, companies or governments and the common timeframe are accepted as one year. Exports, imports, debts and foreign direct investments are some of the main transactions in the balance of payments. Furthermore, the balance of payments has two sub-categories which are current account and capital account. Firstly, the capital account is based on foreign direct investments, financial aids from governments and portfolio investments in general. Secondly, the current account which will be analyzed deeply in further chapters mainly focuses on the exports, imports, savings and investments.

The current account is one of the most important indicators of the economic situation of a country for maintaining economic transactions with other countries. In other words, critical decisions about economic transactions are made by analyzing many factors and the current account balance is one of these important factors. It is calculated as the sum of trade balance, net income from abroad and net current transfers. In the formula below, CA stands for current account, X and M are exports and imports respectively; NY is net income from abroad and NCT is net current transfers.

$$CA = (X - M) + NY + NCT \quad (1)$$

The formula above is the general formula for calculating current account. However, there are some other approaches in defining current account balance. These approaches evaluate the current account from different perspectives and provide inspiration for a deeper research. In this

section, general forms of the approaches are explained and the detailed discussion of some of these approaches is going to be given in the next chapters.

The first approach is the elasticity approach which is very similar to the general formula of current account. In the formula below, F is the domestic currency value of net foreign assets and i' is the interest rate received on F (Genberg and Swoboda, 1992).

$$CA = X - M + F * i' \quad (2)$$

The second approach corresponds to the income-absorption approach. In the equation of this approach Y is the gross national product (GNP) and A is the domestic aggregate absorption (Genberg and Swoboda, 1992).

$$CA = Y - A \quad (3)$$

The third equation is based on saving-investment approach. The formula consists of S , I and BuS which are private sector savings, private sector investment and the public sector budget surplus respectively. Main formula for this approach is the deduction of private sector investment from private sector savings. Nevertheless, the public sector budget surplus emphasizes the fiscal approach in this equation (Genberg and Swoboda, 1992).

$$CA = S - I + BuS \quad (4)$$

The last approach for the current account is created by the ones who consider the capital flows have an impact on current account and this approach is named as the monetary approach. In the equation of monetary approach F' is the rate of change in F and it should exclude the valuation adjustments of the existing net foreign asset position which stems from the changes in exchange rate and interest rate (Genberg and Swoboda, 1992).

$$CA = F' \quad (5)$$

According to the sign of current account in the equation, it is entitled as current account surplus or current account deficit. If the sign is positive, then it is called current account surplus and otherwise it is called current account deficit. Countries which have positive current accounts are stated as net lenders to the other countries while the others are stated as net borrowers from the other countries (Suranovic, 1999). Current account surplus means that the value of exports of goods and services is higher than the value of imports of goods and services with respect to the

equation of the elasticity approach. In the same way, a current account deficit means that a country has more imports than exports. While expressing this judgment the parts other than exports and imports are usually seen as negligible since their values are too small to affect the result. Generally, in the periods of higher economic uncertainty, a country which has current account deficit is not seen as reliable as a country that has current account surplus by the investors because deficit means more imports and more expenditure. So, in the case of a potential crisis the country that has a deficit may suffer from lack of liquidity and this is the main reason of evaluating a current account deficit as a bad indicator. On the contrary, a current account deficit means more investment according to the saving-investment approach. Investment brings more market value, creates more production and attracts more investors and this turns the tide. Thus, more investment gives opportunity to the countries to make more exports and decrease the current account deficit. The current account can move in a long-lasting cycle of deficit and surplus.

“A deficit is not necessarily a bad thing for an economy, especially for an economy in the developing stages or under reform” (Heakal, n.d.). It is critical to determine whether a current account deficit is good or bad. If a deficit originates from the first approach, then its cause may be troubles in competitiveness. However, if it is due to higher investment rates then it is a sign of a highly productive and growing economy and long term profits (Ghosh and Ramakrishnan, 2012). When the two superpowers of the world are considered with their current accounts Heakal’s statement can be understood better. United States has one of the greatest current account deficits in the world but the economy of the whole world is controlled by that country without doubt. The investors mainly do not have great hesitations about the future of the USA while making their decisions. Moreover, its biggest rival China has one of the greatest current account surpluses and its economy is also going well during last decades. These examples support the idea of analyzing the current account in a consistent way since it is not a result of simple equations. It shelters many determinants and its consequences depend on the past and the future actions of the country.

2.3.1. Historical Analysis of the Current Deficit of Turkey

Turkish economy has experienced a rapid international expansion during the last quarter of 20th century and Turkish market has been integrated with the international markets. The integration

process which was very painful for all the country occurred in goods and services market as well as in financial market. Turkish economy has seen many financial crises between the years 1994 and 2001. Many economists think that trade imbalance is the major cause of these crises.

The current account deficit in Turkey significantly increased after 2004 and the average current account deficit in between the years 2004 and 2007 is 16 times higher than the average current account deficit in between the years 1984 and 2003 (Subasat and Yetkiner, 2011). Such rapid and radical increments in current account deficit created certain level of apprehension among people naturally and heated debates took place about the sustainability of this high amount of current account deficit. It is clear that there are some reasons and decisions behind the rapid changes in current deficit and the table below illustrates the current account deficit of Turkey in between the years 1995 and 2013.

Table 2. 24. *Current account deficit data of Turkey*

Year	Current Account	
	U.S. (Dollars Billions)	Percent of GDP
1995	-5.406	-2.373
1996	-2.437	-0.997
1997	-2.638	-1.032
1998	2.152	0.798
1999	-0.925	-0.370
2000	-9.920	-3.720
2001	3.760	1.918
2002	-0.626	-0.269
2003	-7.554	-2.492
2004	-14.198	-3.620
2005	-21.449	-4.443
2006	-31.836	-6.015
2007	-37.781	-5.845
2008	-40.372	-5.526
2009	-12.124	-1.973
2010	-45.420	-6.209
2011	-75.082	-9.691
2012	-48.497	-6.150
2013	-65.110	-7.940

Source: IMF World Economic Outlook, 2014

Table 2.24, clearly indicates that the current deficit has a significant rise after 2003. Before 2003 the current deficit does not surpass 3% of GDP except 2000. It is believed that the reason behind the high deficit in 2000 is the economic crisis which occurred in 2000-2001 and it is reasonable because of diminishing exports. Nevertheless, it is important to analyze what is happening after 2003. There are several causes of why the current account deficit increased in the last decade and these would clarify the situation of Turkish current account deficit.

The first cause of increasing deficit is accepted as the inflation targeting policy which was put into practice in 2006 and it prevented central bank to targeting the exchange rates. Thus, the exchange rates were no longer seen as political variables because in this policy, there is a target inflation rate in the medium term and the policies are determined in order to reach this predetermined target (Esiyok, 2012). Acceptance of this policy brought an overvaluation of Turkish Lira so that the import would be a preferable option in Turkish industry compared to producing internally. This situation also caused high dependence on imports and increased the trade imbalance in Turkey. Adopting inflation targeting policy clearly contributed the rise of current deficit after 2006 but it is not enough to explain what happened before 2006.

The second important source of increasing current account deficit is the dependency on foreign countries in terms of energy. Turkey imports 99% of its oil and natural gas and this percentage clearly shows the level of dependency (Esiyok, 2012). Indeed, it is not reasonable to explain the whole current deficit with the dependency on energy. Moreover, the structural problems in industry make imports more preferable. Furthermore, in order to reduce the effects of inflation targeting and overvaluation of Turkish Lira, the government can announce devaluation but in this case, the energy prices would increase inevitably. Thus, the first two causes of increasing current deficit have a dilemma (Yalinkilic, 2013).

Customs Union Agreement which has entered in force in Turkey in 1996 is another important factor of current deficit in Turkey. With this agreement, Turkey applied the same tariffs with customs union of European Union against the third countries such as China and India which are the most important competitors of Turkey in many industries. New tariffs reduced the power of Turkey on third countries because they made the economic transactions with third countries less profitable. Hence, China and India used the opportunity of being outside of the Customs Union Agreement and became stronger in the countries that Turkey exports. They import the goods

and services with insignificant tariffs from Asian countries and after adding some value, they focus on exporting these goods and services. The greatest drawbacks of Customs Union Agreement for Turkey are the difficulty of obtaining cheap raw material from third countries, the diminishing export rates and increasing current account deficit undoubtedly (Esiyok, 2012).

Another important cause of growing current account deficit in Turkey is considered as the inward processing regime. The main feature of the inward processing regime is to provide industries the opportunity of importing goods without any tariff on condition that these goods will be processed and exported in a certain amount of time. Between the years 1996 and 2005, the proportion of exports from inward processing regime to the total exports is 51.2%. This rate has decreased after 2000 due to the economic crisis but in 2005 it climbed to 50.1%. According to another perspective, in order to export 36.805 million \$, Turkey imported 24.076 million \$. The rate of imports to exports for the inward processing regime is significantly high, especially in electronics, iron and steel industries. It is also reported that the rate is increasing not only in these sectors but also in the traditional sectors such as food and textile industries. Inward processing regime also contributes the dependency on imports and it affects the current deficit in Turkey (Esiyok, 2012).

The alterations on public and private savings are considered as influencers of current account deficit in Turkey. Public industries had the main impact on current deficit until 2003. However, private savings are diminished from 24.6% to 16.6% after 2003 and the share of private industries in current deficit has increased sharply. Private industries had higher consumption and debt rates with the new government policies. High debt rates and high capital inclusions increased the value of Turkish Lira. So, the import rates also increased in order to use the extra capital. All in all, the amount of consumer loans was abundant in order to compensate the production and this reduced the private savings while increasing the current deficit. In a nutshell, overvalued Turkish Lira enables low inflation rates while triggering a rise in the import and consumption rates and a fall in private savings (Esiyok, 2012).

The short history of current account in Turkey proves that there can be many factors behind the fluctuations in trade balance. Moreover, growth rate of Turkey in recent years needs to be taken into consideration because of the savings-investment approach. Nevertheless, some opponents explain the growth rates by the liquidity surplus in last decades, external debt and capital flow.

The presumption of reducing the deficit by slowing down the growth has not worked well yet. Despite the decline in growth rates, there is not a remarkable change in trade balance. In summary, economic variables are not independent from each other and changing one policy can change the whole balance easily. A comprehensive study is necessary in order to test whether the current account deficit of Turkey is good or bad so that the essential precautions can be discussed and taken.

2.3.2. Analysis of the Current Deficits of Other Countries

Fluctuations in current account balance are increasing in recent decades in all around the world. Regardless of the sign of the balance, nowadays current account is changing faster than before. Blanchard (2007) discussed this situation and he prepared a graph which illustrates the standard deviations of current account deficits as a percentage of GDP. This graph shows the pattern of standard deviations of all OECD members, balanced OECD members (the members which were present in OECD in 1988) and the countries in the Euro Area currently so that the changes are clarified and generalized.

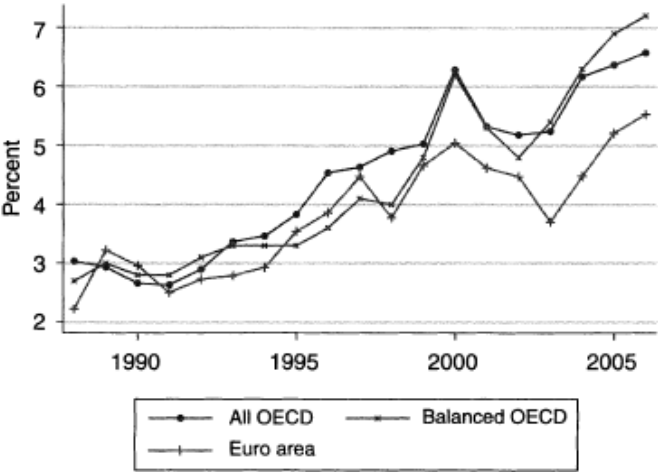


Figure 2. 12. Standard deviation of current account deficit ratio (OECD, 2015)

The figure above proves that the changes in current account balance are getting higher and it is not only for certain countries. This pattern is valid for many countries in the world and obviously the trend in current account balance is changing. To be able to see more details, the table of current account balances of some country groups in the world has been released in the World Economic Outlook in 2014.

Table 2. 25. *Current account balances (%GDP) of certain country groups (1995 – 2013)*

Year	Advanced Economies	Euro Area	Major Advanced Economies (G7)	European Union	Emerging and Developing Europe
1995	0.126	n/a	-0.071	0.367	-2.021
1996	0.076	n/a	-0.082	0.600	-2.251
1997	0.237	0.845	0.029	0.892	-2.935
1998	0.050	0.332	-0.349	0.391	-2.494
1999	-0.439	-0.516	-0.918	-0.206	-4.024
2000	-0.977	-1.502	-1.487	-0.992	-4.815
2001	-0.881	-0.381	-1.442	-0.350	-1.838
2002	-0.826	0.627	-1.438	0.116	-2.852
2003	-0.736	0.277	-1.497	0.058	-4.056
2004	-0.593	0.752	-1.277	0.492	-5.546
2005	-1.087	0.115	-1.748	0.038	-5.073
2006	-1.198	-0.191	-1.896	-0.222	-6.549
2007	-0.840	0.027	-1.195	-0.413	-8.099
2008	-1.206	-1.557	-1.424	-0.959	-8.180
2009	-0.168	-0.132	-0.589	0.058	-3.194
2010	-0.040	0.107	-0.785	0.031	-4.907
2011	-0.178	0.127	-0.886	0.361	-6.432
2012	-0.100	1.401	-1.071	1.003	-4.577
2013	0.399	2.372	-0.870	1.685	-3.900

Source: IMF World Economic Outlook, 2014

Table 2.25 shows European Union in general has more surpluses than deficits and the values are fluctuating along the years. This is a sign of sustainable current account balance because it seems European Union uses the money for investment in deficit times. Euro Area countries have the similar current account balance to European Union countries. When the advanced economies and G7 are considered, they generally maintain low levels of current account deficits. These countries are interested in many kinds of investments such as FDI or M&A and this is why the overall current account balance has a negative sign in the last years. In the last column of Table 2.25, emerging and developing countries in Europe are exposed. The large deficit values indicate high import rates which are essential for developments and future investments. The percentage differences between advanced economies and emerging economies stem from the export levels basically. Advanced economies are more stable and stronger than emerging economies and they

have more chance to export while they are investing. So, their current account is more balanced than emerging countries.

Blanchard (2007) states that the deficits in rich countries are driven by private savings and decisions on investment rather than fiscal deficits and these deficits are financed by the help of equity flows, FDI flows and own-currency government bonds instead of bank lending. Furthermore, Blanchard also expresses there are two opinions about the intervention to current account deficit (2007). One is recognized as Lawson doctrine which defends the idea that the current account deficits are reflections of private savings and investment decisions and there is no need for a government intervention to a deficit. The second idea is known as prudential or IMF view and it states that even if a deficit is a reflection of private savings and investment decisions, government interventions are necessary to diminish the deficits to a desirable level. Today the IMF view is commonly accepted by many countries in the world (2007).

Some extreme examples from the last years can help to understand different dimensions of current account balance. Firstly, Iceland has some remarkable issues on current account deficit. Its overall deficit between 2006 and 2008 is about 20% of its GDP (World Bank) and Iceland was on the edge of bankruptcy in those years. The amount as dollars is not too much but the percentage of its GDP was huge. How did Iceland survive from such a situation? There are three aspects of the survival of Iceland: First, the government allowed some banks to bankrupt and did not undertake their debts. Of course, the creditors –mainly Netherlands and England- are not happy about the situation and the judicial process still continues. Second, Iceland devaluated their national currency -krona- by 100%. Despite the devaluation, the inflation increased by only 25%. Wages were decreased from 20 euro per hour to 13 euro per hour approximately. Since Iceland does not have any dependence to other countries in terms of energy, they managed to increase their export levels without a radical increase on imports. Iceland has an energy advantage because of the volcanoes in Iceland provides high amount of thermal energy. Energy has the biggest effect on imports of many countries and Iceland used this advantage while devaluating its currency. Third, mortgage debts -ones that are in euro- of the public have been doubled because of devaluation and the government wrote this kind of debts of public. Hence, the demand did not decrease and consumption continued in Iceland (Genc, 2013).

Portugal's current account deficit gives further notices about average countries in Euro Area. Portugal's situation can be separated into two periods. The first period is 1995-2000 period in which Portugal encountered an economic boom. Decreasing interest rates and high expectations of adopting the euro rose the private spending of Portugal in this period. Then, the current account deficit increased and the unemployment rate decreased due to the growth in production. Nevertheless, these events resulted in the appreciation of unit labor costs which is too high with respect to the Euro Area averages. Expectations of adopting the euro did not come true and the second period of Portugal started with significantly reduced private spending after 2000. During this period, the productivity growth stayed low and unemployment rate increased again. However, the current deficit remained in the same percentages because of the appreciation of Portuguese goods. Hence, Portugal's import rates increased and competitiveness decreased. The figure below shows the changes of Portugal's unemployment rate and current account balance in those periods (Blanchard, 2007).

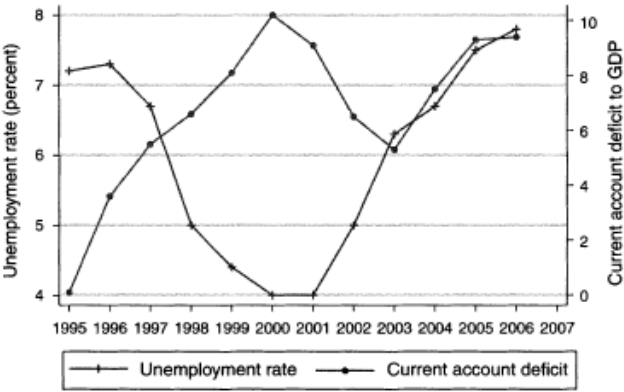


Figure 2. 13. Unemployment rate and current account deficit of Portugal (1995 - 2007) (OECD, 2015)

In the case of China and the U.S. as superpowers, the current account generally is not affected by exchange rate regimes significantly and rigidities about price and wage are not related. For instance, China has a current account surplus 1.931 percent of GDP. When the GDP of China is considered 1 percent is an extremely big amount and it was about 9% in years 2006, 2007 and 2008 (World Bank). Indeed, China is the country which has the biggest current account surplus in the world but where does this surplus of China come? According to Blanchard (2007), it mainly comes from high saving rates of both private and public industries. However, these savings have a negative impact on retirement benefits and health insurances but current account

surplus brings some economic advantages to China as well. If China decides to increase the welfare of its citizens by increasing the retirement benefits and health insurances then its surplus will melt. So, this supports the IMF view which sees the government intervention as a necessary action to control current balance. Figure 2.14 shows the current account surplus of China.



Figure 2. 14. Current account surplus of China (%GDP) (Trading economics, 2015)

On the other side, the U.S. has the biggest current account deficit in the world and according to Blanchard, it is due to low private saving rates beside budget deficits, high foreign saving, low foreign investment and high interest of investors in the U.S. assets over foreign assets. Moreover, he believes that the U.S. needs a government intervention to reduce its deficit. Policies about reduction in fiscal deficit and depreciation of the dollar will help the U.S. to decrease its deficit (Blanchard, 2007). Many experts believe that the current account deficit of U.S. is unsustainable and it is one of the greatest menaces to the global economy. On the other side, some experts defend that the U.S. economy is very large and stable compared to the other economies. Thus, it can carry the burdens of high current account deficit better than other economies. Figure below illustrates the current account deficit to GDP of United States.

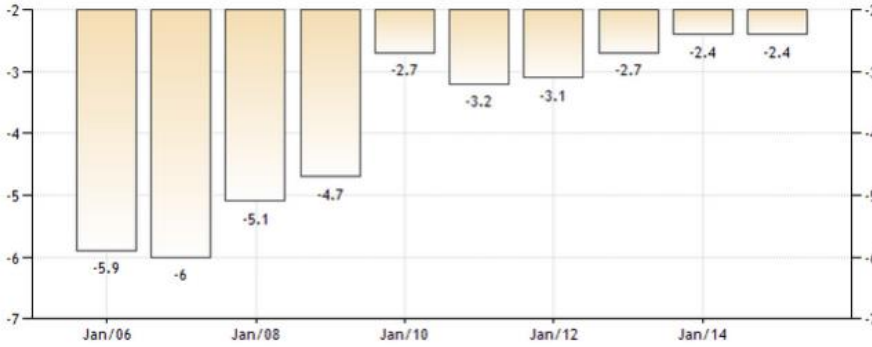


Figure 2. 15. Current account deficit of United States (%GDP) (Trading economics, 2015)

3. Theoretical Models

3.1. Analysis of Models About Current Account Balance and Determinants

This part of the research is dedicated to analyze previous researches in order to explain the correlation between the current account balance and some macroeconomic facts.

The section will be pursued into two different sub-divisions. In the first sub-section, three literature approaches, which focus on current account balance in different perspectives, called the elasticity approach, the total expenditure approach and the monetary approach will be investigated.

The second sub-section of this part will be on examination of some determinants in literature and their expected effects on the current account balance.

The goal of this section in the research is to try to find out some knowledge and to construct some expectations to interpret the results. In addition, this section will illuminate the choice of the determinants which will be used in this research.

3.2. Previous Approaches for Explanation of Current Account Balance

All three concepts approach to the current account balance from a different perspective but it is possible to say that all of them have some weaknesses while explaining the current account balance.

However, these concepts reach consistent results with each other. According to these concepts, the external imbalances in economy depend on the domestic policies and the solution of deficit is possible with appropriate combination of exchange rate, monetary and fiscal policies (Erkilic, 2006).

3.2.1. Elasticity Approach

The main focus point of the elasticity approach is the foreign trade balance which is the most critical item of the current account balance compared to the other components. Foreign trade balance is highly depended on the competitiveness of countries; thus International prices are very effective to determine the foreign trade balance since they are the substantial source of competitiveness. If the international prices diminish in a country, it is expected that the export of goods will be easier and will have an increment. The prior reason causes low prices can be the devaluation of the domestic currency which might be done by central banks intentionally. If

we accept the undervalued domestic currency leads low good prices, it is possible to anticipate an increase in export amount which can support the balance of payments.

The response of the trade balance to the movements in the real exchange rate is described by a J-Curve (Rose and Yellen, 1989). J-Curve indicates that devaluation in currency worsens the trade balance in the first stage but after a point it will make a corrective influence on trade balance which moves the balance to a surplus.

A depreciation (or devaluation) of the domestic currency may stimulate economic activity through an initial increase in the prices of foreign goods relative to home goods: by increasing the global competitiveness of domestic industries it diverts spending from the former to the latter (Kandil and Mirazaie, 2005). Normally, what is expected, nominal devaluation or depreciation can only help to recover trade imbalances if the trade items' response to price changes in a predictable way (Reinhart, 1995). However, this corrective effect is dependent on the Marshall-Lerner conditions. If the foreign trade of a country perfectly inelastic to the price changes, it is not logical to expect any improvement in the trade balance. This situation called "zero elasticity" is very rare case, but Marshall-Lerner condition tries to figure out the minimum elasticity point to expect the improvement. The Marshall-Lerner condition indicates that the sum of demand elasticity of import and export to price must be equal or exceed unity "1" (Norrbin and Melvin, 2013).

The balance of trade can be given as the following formula where the terms the ratio of nominal exports to nominal imports expressed by BT, the volume of exports by X, domestic prices by P_d , the volume of import by M, foreign prices by P_f and the nominal spot exchange rate by S:

$$BT_t = \frac{P_{dt} X_t}{P_{ft} S_t M_t} \quad (6)$$

This equation can be written in the form of:

$$BT_t = X_t - M_t - E_t \text{ where } E_t = S_t - P_{dt} + P_t = \text{real exchange rate} \quad (7)$$

In addition, long term import and export demand are defined by (Caporale, Gil-Alana and Mudida, 2012) as following:

$$X_t = \alpha_X + \beta_f Y_{ft} + \tau_X E_t + \gamma_X T \quad (8)$$

$$M_t = \alpha_M + \beta Y_{dt} + \tau_M E_t + \gamma_M T \quad (9)$$

Where τ_X and τ_M stand for the elasticities of the export and the import. Moreover, Y indicates the domestic and foreign real income respectively.

By the combination of these formulas, it is possible to get the formula for the long-run balance of trade:

$$BT_t = (\alpha_X - \alpha_M) + \beta_f Y_{ft} - \beta Y_{dt} + (\tau_X + \tau_M - 1)E_t + (\gamma_X - \gamma_M)T \quad (10)$$

This expression explains the necessity of sum demand elasticity of import and export must be greater than one. Under these circumstances, current account can be expressed by elasticity approach as same as the formula given in the previous chapter.

$$CA = X - M + F * i' \quad (11)$$

As it is mentioned before, there are some shortages in the elasticity approach for the explanation of the current account balance, since the elasticity approach only provide explanation for trade balance which is just a part of the balance of payment. In addition, elasticity approach examines the effects of devaluation on current account balance; however, it contains no instruction regarding to the untraded good in the definition of real exchange rate (Erkilic, 2006). All in all, in this approach, only the price effect of devaluation is taken into account, but the income effect of devaluation is ignored (Adedeji et al., 2005).

3.2.2. Total Expenditure Approach

The elasticity approach expresses the effect of devaluation on the prices which may affect the trade balance; however the total expenditure approach considers the expenditures and income in the explanation of current account balance. On that sense, the total expenditures' approach tries to explain the influence of devaluation on the expenditures rather than prices (Adamu and Itsede, 2009). According to this approach, external imbalances can only be covered by the arrangements in the expenditures' structure since it uses the national income formula:

$$Y = C + I + G + X - M \quad (12)$$

By rearranging the formula, it is possible to get formula following:

$$X - M = Y - (C + G + I) \quad (13)$$

The approach considers the trade balance as the main representative of balance of payments. Furthermore, it is very common in literature assuming trade balance as a proxy for current account, although the latter includes net investment income and net unilateral transfers (Enders and Lee, 1990; Kim and Roubini, 2008).

If the total expenditure actualizes more (less) than production (Y), import (export) would be more than the export (import) and it will result in deficit (surplus) for current account (Adamu and Itsede, 2009).

The equation requires an economy should increase the production level (Y) or decrease the expenditure level in order to improve its foreign trade deficit. In the full-employment status where the production level cannot be increased more, the devaluation can cause the allocation of sources to the export sector and shift the expenditures from import goods to domestic products (Tiryaki, 2002).

The equation can be derived for further more and shaped for analyzing “saving-investment” perspective:

$$X - M = S - I \text{ where } S = Y - (C + G) \quad (14)$$

This equation emphasizes that the investment supporting policies could have negative effects on trade balance while the saving supporting policies can improve current account balance since they provide a decrease in expenditure items.

Total expenditure approach also proposes a new determinant for the current account balance which is supportive for the Mundell-Fleming approach which states the external account and fiscal balance move in the same direction. It means that an increment in budget deficit results in an increase for interest rates that leads a rise in capital inflows and appreciation of domestic currency which cause a current account deficit and it is called as twin deficits (Uz and Ketenci, 2009). The blind side of the total expenditure is totally the reverse of the elasticity approach which means that total expenditure approach considers the income effect of devaluation but ignores the price effect.

3.2.3. Monetary Approach

The Monetary approach focuses on the supply and demand of money. The proposal of this approach is that balance of payments and exchange rate movements are caused by the changes in money stock.

Under the equilibrium and open-economy assumptions, the model suggests that the demand for the money stock, M_d , is equal to the supply of the money stock, M_s and the money stock is equal to two sets of liabilities, net external assets, R and net internal assets of domestic financial system, D .

$$M_d = R + D \quad (15)$$

If the equation is adjusted to the following:

$$\frac{\Delta R_t}{R_t} = \frac{\Delta M_t}{M_t} - \frac{\Delta D_t}{D_t} \quad (16)$$

The term ΔR_t can be considered as the balance of payments. Increasing the demand of the money stock (increased prices or output and decreased costs of money holding) will result in a surplus in the balance of payments (Borts and Hanson, 1979).

The balance of payments consisted of two sub-accounts which are the “current account” and “capital and financial account”.

$$R_t = CA_t + KA_t \quad (17)$$

According to this equation, the condition of zero external asset can be provided only by covering a current account deficit with a surplus in capital account or vice versa. It is also the condition of keeping the balance of payments.

On the other hand, monetary approach explains only the short term effect on the balance of payments since it neglects the effects caused by the correlation of stock and flow determinants in the long term (Erkilic, 2006). Moreover, the monetary approach has some assumptions which can only be implemented to an open economy with fixed exchange rates. Briefly, the monetary approach can be considered as a good methodology in terms of explaining external and internal balances through money supply changes but it is insufficient for explaining determinants of current account such as the exchange-rate and terms of trade effects.

3.3. Previous Researches About Determinants of Current Account Balance

The fact makes the current account balance one of the strong indicators for an economy is being a sign of relative competitive power. Having a deficit can be interpreted as the country is losing its competitiveness since it imports more than its exports. Although the surplus does not mean a strong economy, a large current account deficit can imply an imbalance of a country's economy. That perspective boosts the value of current account balance for the researchers. As a result of this interest, there are lots of researches which are conducted to analyze the different characteristics and determinants of current account balance.

The aim of this section is to gather the specified determinants and the results of some empirical analysis for analyzing the effects of these determinants on current account balance. In order to do that, all gathered determinants will be examined separately to provide a basis for comparison with this paper's empirical analysis.

3.3.1. GDP Growth Rate

One of the most known determinants of current account deficit is the gross domestic product (GDP) growth rate. GDP growth rate can be resulted from the changes in labor supply or the changes in production efficiency. However, it is more logical to expect that the influence of efficiency changes would be more critical and persistent.

GDP growth rate is related to the current account deficit in two ways. Firstly, as it is expected, higher GDP would lead higher saving rates or investment rates since governments have two choices, to save or invest, in order to maintain development.

The results of empirical researches about the GDP growth rate and current account balance correlation indicate that the growth in GDP causes higher current account deficits. Calderon, Chong and Loayza state that although a positive growth rate can be related with higher saving rates, it seems worsening the current account balance by having more correlation with investment concept (n.d).

The second way of influence is indicated by Glick and Rogoff as if the growth rate is the conclusion of a temporary volatile efficiency; it might result in a surplus for current account (1995).

In conclusion, the expected sign of the effect of GDP growth rate on current account balance is negative but it might change in different efficiency conditions.

3.3.2. Previous Year Current Account Balance

The conducted researches about the lagged current account balance mostly resulted in the persistence of current account deficit. The results indicate that the current account array is stationary and solid (Razin, 1995).

3.3.3. Savings

Regard to the total expenditure approach, it is possible to mention that savings should lead a current account surplus since the current account is defined as the difference of savings and investments. Thus, a current account deficit may reflect a low level of national saving relative to investment (Ghosh and Ramakrishnan, 2012).

On the other hand, it must be mentioned about the paradox of growth, investment and savings. All the researches about the correlations of these determinants emphasize that there is a high correlation and causality between these determinants. However, according to Ventura (2002), behind the causality, savings are expected to move current account balance into a surplus.

3.3.4. Investments

There are multiple ways of improving a country's income such as efficiency and terms of trade changes. As it is mentioned, there is a correlation also between the income, savings and the investments. Since savings are the income minus expenditure, which is the sum of consumption and investment, current account balance can be considered as the difference between saving and investment (Park and Shin, 2009).

Growth in income is usually used to cover inter-temporal differences of consumption by leading to short-term foreign asset portfolio (Erkilic, 2006). Therefore, it is expected that investments would have negative effects on current account balance unlike savings. What is expected that an increase in income would first become saving in the accounting of a government, but afterward these savings would be used as investments which will worsen the current account balance.

According to Kraay and Ventura (2002), investment has negative effects on current account balance no matter to being debtor or creditor country.

3.3.5. Real Interest Rates

If the current account is described as the difference between saving and investment since they are also the key functions of interest rate, it is quite possible to have some correlation between the real interest rate and current account balance. The correlation of real interest rates and current account balance depend on the some factor affecting the economy.

An increase in interest rate can have different results in an economy. It can reduce the consumer spending because the saving is a more attractive choice or it can help to balance inflation. Both cases have positive effects on current account balance either lowering the import level or making export more competitive. On the other hand, higher interest rates can lead to higher foreign capital entrance which results in appreciation of exchange rate. The appreciation of exchange rate tends to worsen the current account due to the cheaper import and more expensive export. However, the increase of interest rates can be concluded in a different way. Arica and Ener indicate that it encourages the purchase of domestic and foreign securities together with the goods and if the foreign capital cannot enter as much as these purchases, the balance of payment might be in deficit (2012).

3.3.6. Fiscal Balance

Fiscal balance describes the equilibrium between the expenditures and the income of a government. A model called Mundell – Fleming suggests that fiscal deficit, higher expenditure than the income, results in higher domestic interest rates, the exchange rates and capital inflows which trigger the current account deficit (Bitzis, Paleologos and Papazoglu, 2008). This expectation called as twin deficit. Twin deficit hypothesis proposes that budget deficit causes current account deficit according to Keynesian approach although Ricardian approach proposes no correlation between these two accounts. Keynesian approach emphasizes that rising of interest rates decreases the income and expenditure together, which affects the balance of payments (Akdis, 2006).

Higher interest rates attract more capital inflows leading to the appreciation of the domestic exchange rate and moreover, loss of competitive power in terms of domestic prices. As a consequence, the loss of competitiveness worsens the current account balance.

3.3.7. Changes in Public Consumption

Changes in the public consumption might be considered as another determinant for current account balance. It can be considered in the same direction with the saving and investment since it stands in the same national accounting formula. If the sudden changes in expenditure are afforded by the rise in tax ratios, it probably enhances the current account deficit. Glick and Rogoff explain this situation as following “the temporary changes in consumption which financed by taxes will increase income slower than the temporary consumption increment and cause a higher current account deficit” (1995).

3.3.8. Openness

Openness is a ratio expressed as the foreign trade volume divided by gross domestic prices. Thus, it can be considered that openness ratio might be a determinant for current account. However, every economy can have different conditions which affect the determination of openness level. It can be tough to find out a correlation between the current account and openness level because of the different country-based factors (Erkilic, 2006).

Openness level can influence the current account in different perspectives since the structure of foreign trade can vary based on each country.

3.3.9. Real Exchange Rates

The correlation model between real effective exchange rates (REER) and current account balance is the most challenging topic regarding current account determinants in an open economy.

One of the analyzed previous approaches “elasticities approach” proposes that an appreciation in the REER leads to higher level of import position and lower level of export position which potentially worsens the current account balance. This effect is explained by the Marshall – Lerner condition which indicates that the devaluation may improve current account balance under the condition of demand elasticity is higher than unity (Henry and Longmore, 2003).

Regarding the result of Marshall – Lerner condition, the devaluation will show J-Curve effect which means that current account will worsen at first but then will improve.

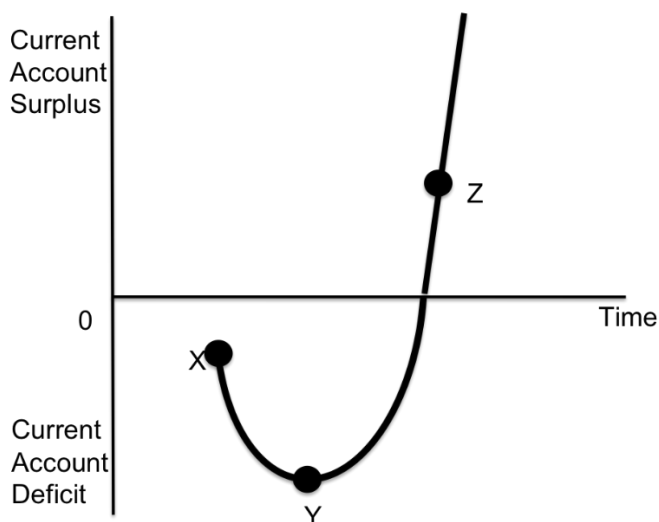


Figure 3. 1. *J-curve (Dalia's economic blog, 2010)*

On the other hand, there are lots of researchers who analyze the inter-temporal effects of devaluation on the current account balance. According to these researches, there is a positive but weak correlation between real exchange rate and trade balance, but it might be mentioned that the direction of the correlation is ambiguous (Obstfeld and Rogoff, 1995).

3.3.10. Terms of Trade

The terms of trade is an index that shows the value of a country's average export prices, relative to their import prices. Therefore, a fluctuation in terms of trade index might have serious impacts on trade balance which affect also the current account balance.

Terms of trade and current account balance relationship can be explained by “Harberger-Laursen-Metzler (HLM) effect. With regard to this model, an improvement in terms of trade can improve the income of a country under the assumption of temporariness, hence this income is directed to the savings and leads to a surplus in current account balance (Ghosh and Ostry, 1995).

In addition, Freund (2000) emphasizes that the improvement of current account balance occurs in two ways, in the beginning, by the fall in import but later, by the increment in the export.

However, the analysis of real exchange rate and terms of trade can be collateral since changes in the real exchange directly affect price levels and hence also the terms of trade.

3.3.11. Energy Prices

Current account balance depends on many components. Although energy prices can be seen as an extraordinary determinant for the current account balance, it exists in some researches because the dependency on the energy import in huge amounts makes energy prices a potential determinant for the current account balance. For example, Kandil and Greene (2002) emphasize that the USA is a net energy importer and with a low demand elasticity of energy import, it is vulnerable against the sudden shocks. Moreover, even a small reduction can enlarge the current account deficit.

3.3.12. Developed Countries Growth Rate

The major part of the current account balance is related to the trade balance of a country. As it is mentioned before, a correlation is expected between the country's own GDP growth rate and balance of payments. However, the growth rate of industrialized countries might have an influence on a country's balance of payments since the major part of export of developing countries goes to these industrialized economies.

The researches which examine the balance of payments of countries individually usually examine this determinant but it is difficult to examine it for a bunch of countries.

3.3.13. External Debt

External debt is one of the most critical indicators for evaluating reliability of an economy which states the external dependency of a country as much as the import. The hypothesis which considers the external debt as a determinant for current account deficit indicates that the countries with high external debt stocks are more open to volatilities in the international interest rates and it might have crucial effects on the current account balance of a country.

Yucel (2003) figured out a negative and significant correlation between the Turkish economy's external debt stock ratio and the current account deficit. This evidence forms the basis for considering external debt as a determinant in this research.

3.4. Discussion and Prediction of Additional Variables

This part of the research is dedicated to propose other variables which can influence the current account balance rather than the common determinants above.

3.4.1. Reserves/Import

One of the most common usages of the reserves is to prevent country against the sudden shocks. Moreover, most valid evaluation tool for adequacy of reserves is the import coverage ratio which is generally implemented to economies that are open to shocks in the current account balance (IMF, 2011). Therefore, the import coverage ratio is included in this research with a null hypothesis of that countries with higher import coverage ratio might have chance to increase their current account deficit since they are more resistant to sudden shocks in economy. In other words, this ratio also can be considered as the sustainability indicator of current account deficit.

3.4.2. Inflation Volatility

Another uncommon macroeconomic variable in the research of current account balance is the inflation. Countries usually try to keep the inflation slightly positive and constant for a sustainable economy. The general meaning of inflation is a rise in the domestic price and as a rule of the trade, if the domestic prices increase, the export is expected to be narrowed or vice versa. For that reason, the causality of inflation percentage changes will be included in this research to analyze its influence on the current account balance.

4. Data

4.1. Parameters of Data

The features of the new model are going to be discussed in this chapter by the help of previous studies and analyses. Main aim of this work is to analyze the significant determinants of the current account balance of developing countries that are similar to Turkey in economic terms and to compare them with Turkey. Instead of analyzing the determinants country by country, it is better to see the general effect of each determinant to all of the selected countries. The general effects are expected to give some insights about the situation of Turkey as a developing country which is also in the process of being a member of the European Union. The comparison between the general effects and individual effects which are specific to Turkey gives important clues to explain the differences and make reasonable suggestions for the future. Well-developed statistical techniques and programs are going to help in order to see the critical points better than before.

Basically, the new model consists of two main parts. In the first part, the general effects are going to be determined and discussed and this part includes the data of Turkey as well. In the second part, the data to be analyzed is only the data of Turkey. Therefore, the interpretation of the differences has utmost importance in order to provide intervention opportunities to the current account balance by controlling its variables.

Establishing a new model requires a pre-assessment of some characteristics of countries. There are two crucial parts in establishment of the new model: The first one is deciding on which countries carry similar characteristics with Turkey. The second one is choosing the best potential determinants which explain the current account balances of these countries in an effective way.

4.1.1. Selection of Countries

This study tries to explain the variables behind the current account balance, specifically for Turkey. Moreover, it is better to integrate it with the current account balances of similar countries in order to reach more reliable and consistent results. The general analysis could be made by using all countries in the world but it would be time consuming as much as it would become unreliable because the same variable can affect current account balance of a country in a positive way while affecting the other's in a negative way. It depends on many parameters

such as government policies, economic history of the country, current situation of its trade flows etc. Hence, conducting the analyses on similar countries eliminates such different effects and each variable is anticipated to affect the current account deficit of each selected country in the same way.

The selection process starts with determination of how many countries would be sufficient for this analysis to be statistically strong. The time span is determined, which will be explained later and it covers all the years from 1995 until 2013. The data of 19 years would provide the impacts of variables and give some insights for the short term. However, 19-year data of a country may have many biases and missing values. Also, the variance would be very high inevitably. If it was possible to find a few countries that are under exactly the same conditions with Turkey, then the general effects would reflect the situation of Turkey better. Unfortunately, every country has its own laws and policies and it makes finding two countries which are exactly the same impossible. A few very similar countries could be a good solution but in this case, the high variance would affect the results and unforeseen circumstances or effects might make the results unreliable. Since it is not possible to manage all possible variables, the error which comes from the unforeseen circumstances would be large. On the other hand, inclusion of half of the countries in the world will decrease the variance that comes from unforeseen effects. Nevertheless, the obvious economic differences between the countries will increase the variance and the results will be meaningless while explaining a condition of a single country. Thus, a wise selection should be made in order to reach coherent results.

There is a tradeoff between setting high or low number of similar countries. To reach statistically significant conclusions, it is decided to have at least 300 data points for each variable. The data availability is assumed approximately 80% in the time span. In other words, 20% tolerance rate for the missing values is set and a country might have lack of data up to 20%. This assumption makes the required number of observations 375. Since the time span is 19 years, 20 countries would be sufficient to analyze the general effects of the determinants of current account balance. 20 countries mean at most 380 data points for each variable which is enough to balance the tradeoff. Indeed, it is a rough forecast for the amount and accessibility of the data before the data collection process. The accurate numbers will be given in the analysis part.

After setting the required number of countries, the new task would be the determination of the criteria which enable us to finalize the country selection process. The first criterion is GDP per capita values of countries in the last year of the time span. GDP per capita is selected as a criterion because it is one of the most important indicators of activity levels of a country. General GDP values are biased in this selection because GDP of a country highly depends on the population. Hence, the GDP per capita values of each country were taken because per capita values make comparisons easier by showing the relative performances of each country. The GDP per capita values of all countries were sorted and the countries that have similar GDP per capita values with Turkey were noted.

Openness is the rate of country's total trade which is the sum of exports and imports to the GDP of the country. It is a very critical indicator of a country's trade level and it provides basic understanding about the export and import rates of the country. Since the export and import rates determine the current account balance in the general formula, openness data of the countries is the second selection criterion in this study. Low openness implies the high barriers to foreign trade such as high tariffs or restricted quotas. Also, low openness can stem from the geographic and economic distance of a country from its potential trade partners. For instance, Iran, which can be a similar country to Turkey in many terms, has closed economy and this makes Iran a non-similar country in this work because its openness is extremely low due to its restrictions to foreign countries. Another example is Japan whose openness is around 35% of its GDP and this is caused by its geographical conditions. It is far away from the European countries and many parts of America and Japan lose its potential trade partners because of its geographical condition. For this work it is decided that it would be coherent to choose the countries which have openness values more than 50% of their GDPs in 2013.

Turkey is seen as a developing country today and investments from home and abroad constitute an important rate of its economic transactions. Developing countries have higher growth rates than the developed countries in the last decades and in general, their economic parameters have more fluctuations than the others'. There are some rights and obligations that the WTO determines and developing countries have some advantages about these provisions. For example, developing countries have longer transition periods for some WTO agreements and they can spend more time for adaptation and implementation processes. Moreover, developing countries

can get technical assistance from WTO in some cases. Hence, it would be beneficial to choose the developing countries as the similar countries to Turkey rather than choosing developed countries. By this way, the bias that comes from the different WTO policies could be eliminated.

European Union consists of 28 countries today and it is an extremely important union economically. The frontiers between the European countries have become less visible after 1945. The European Economic Community named Europe as a common market in 1957. The enlargement of the EU took part in 1970's and the developments in years made the community stronger against the other parts of the world. In the beginning of 21st century, Euro has been accepted as the common currency in many countries in the EU and the extent of the EU changed significantly. Turkey is still in the membership process to the EU and the integration processes continue. According to the EU website (2015), apart from Turkey, there are 4 candidate countries and there are 2 potential candidates. Recently, many countries have joined the union such as Croatia, Bulgaria and Romania. Those countries have lots of similarities with Turkey with respect to their economic developments and policies that were adopted on the road of becoming a member of the EU. For this work, the recently joined and candidate countries of the EU would have similar economic indicators and similar processes with Turkey. Thus, these countries will make the further analyses more consistent.

After careful consideration, 19 countries which are similar to Turkey, according to the criteria above, were selected. By the inclusion of Turkey, the number of the countries would be 20 which is the sufficient amount for further statistical analyses. The countries can be seen in the table below.

Table 4. 1. *Selected countries for the statistical analysis*

Algeria	Estonia	Malaysia	Slovakia
Bulgaria	Hungary	Mexico	South Africa
Chile	Latvia	Peru	Thailand
Croatia	Lithuania	Poland	Turkey
Czech Republic	Macedonia	Romania	Uruguay

4.1.2. Selection of Determinants

The determinants of the current account balance from the previous studies were examined in previous chapters. Moreover, there are abundant amount of possible independent variables

which can explain the current account balance, according to the previous studies. In order to conduct an effective and time saving analysis it is crucial to analyze the variables which are meaningful. Thus, trivial variables should be eliminated for preventing redundant analysis and data collection. In addition, the correlation between the variables should be determined because a high correlation can turn a significant variable into an insignificant one. Before the further analysis of the variables, the first list of selected variables are shown in the table below.

Table 4. 2. *Preliminary selection of variables*

GDP Growth Rate
REER (2007 =100) Broad
Real Interest Rates
External Debt Stocks (%GNI)
Terms of Trade (2000=100)
Budget Deficit (%GDP)
Investment (%GDP)
Openness
Inflation Volatility
Real International Reserves / Import
Export (%GDP)
Gross National Savings (%GDP)

GDP growth rate is one of the general potential variables of current account balance and it is used in almost all of the previous studies. For this work, it is believed that GDP growth rate will be a significant variable in the regression analysis. Apart from GDP growth rate, real interest rates, investment to GDP ratio, inflation volatility, real international reserves over imports and rate of gross national savings to GDP look like independent variables that have no significant correlation between one another.

On the other side, there are some variables which are problematic. For instance, there is an obvious correlation between openness and export to GDP ratio. Openness is the rate of sum of exports and imports to GDP and it includes the export to GDP ratio. Therefore, exclusion of one of these two variables would reduce the bias. Since openness is a more comprehensive variable, export to GDP ratio was eliminated from the potential list of variables.

There are also some issues that are not very obvious and it is hard to take action without a statistical analysis. For example, real exchange rate and terms of trade are the two variables

which might have certain degree of correlation. Although they indicate different values and they are used in different areas, they might affect each other significantly. The existence of a potential relationship between these two variables is going to be determined after a regression analysis. The analysis will be done by using both of them, omitting real exchange rate and omitting terms of trade separately. According to the results of the regression analysis, the final decision will be made. A similar problem is seen between external debt stocks (%GNI) and budget deficit (%GDP). The probability of high correlation between these two variables is less than the previous two variables but it also needs to be analyzed carefully.

Table 4. 3. *Final list of variables before the statistical analysis*

GDP Growth Rate	<p>Green: Acceptable variables</p> <p>Red: Correlated in between</p> <p>Orange: Correlated in between</p>
REER (2007 =100) Broad	
Real Interest Rates	
External Debt Stocks (%GNI)	
Terms of Trade (2000=100)	
Budget Deficit (%GDP)	
Investment (%GDP)	
Openness	
Inflation Volatility	
Real International Reserves / Import	
Gross National Savings (%GDP)	

Table 4.3 illustrates the final list of potential independent variables which explain the current account balance. The green variables have no problem with the others. The red ones might have a correlation between each other. The orange ones also might have a significant correlation between each other. Several sensitivity analyses should be done in order to evaluate the potential correlations and to reach better results.

Some variables of a certain year would probably have a significant impacts on current account balance of the same year but what about the effects of previous years? Many decisions are taken according to the data of the previous years. Hence, it is better to see the previous years' effects of selected variables. However, the effects that come from more than one year is considered as ignorable because the actions are taken immediately in today's economy and each country tries to be proactive rather than being reactive. As a result, one year lags are also going to be used in the explanation of current account balance. That means the number of variables of the final list

will be doubled. Furthermore, one last variable is anticipated and it is the previous year's current account balance. It might also have a significant impact on the next year's current account balance by influencing the decisions. Definitely, these are the selected variables which the data in the time span are required in order to proceed and gather results. The latest version of significant variables will be determined after statistical analyses.

4.1.3. Selection of Time Span

The selected countries were decided according to the similarities with Turkish economy and the determinants according to their potential of being critical for current account balance. On the other hand, there should be another parameter to form a panel data analysis. The third parameter "Time" was one of the most challenging parameters to be decided due to the trade-off between reliability and consistency. The long-term periods tend to harbor different economic periods inside. On contrary, the short-term periods could be insufficient to gather reliable results. Therefore, the length of the period was very crucial to keep data's consistency.

In the selection of time span, Turkey is decided as the prior country because it is the main focus of this research. The current account deficit problems in Turkey gained a new dimension after the announcement of full liberalization in 1994. Thus, the year 1995 is taken as the first year in this research to keep the conditions above. The year 1995 was also critical for other countries because most of the new EU countries' data started to be gathered after this year and these countries are extremely crucial with their representative aspects for Turkey. All in all, the time span has been chosen as 1995-2013 to maintain the analysis in a reliable and consistent way.

4.2. Data Collection

4.2.1. Structure of Data

Data used in statistical analyses are collected with respect to annual observations over the period of 1995-2013. Mainly, the determinants were chosen as percentages or ratios in order to prevent confusions and provide consistency between different countries.

The data of 19 years were collected for 20 countries. There are some missing values especially for the recent member countries of the EU but the tolerances were determined by considering these missing values. In a fully balanced dataset the total number of data points is 360. In the beginning, this number is assumed as 380 but if the lagged variables are included the first year

of the data will be lost and 20 data points will be ignored. However, since the existence of the missing values is inevitable, the dataset is unbalanced and it consists of approximately 350 data points. Moreover, accessibility of the data is also higher than the expectations. Only 8 data points are missing in the actual dataset and this is certainly the good news for the reliability of the research. The data points can be enlarged by taking quarterly data and this would absolutely increase the reliability of the test results but it is impossible to get quarterly data in all the determinants. Therefore, the rate of missing values will increase with quarterly data and the effects of determinants might disappear. For the sake of simplicity and efficiency, annual data are used in the further analyses.

The determinants are percentages, ratios or indexes so that the potential errors are avoided. In other words, the consistency between different economies of different countries is provided by taking ratios rather than taking standard values. For example, the GDP values of Turkey and Latvia cannot be expected to become similar. However, the percent changes of GDP values from year to year follow a similar pattern and it will be used in the regression. Actually, the conversion of the variables into percentages, ratios or indexes is a standardization of these economic variables for the correct usage of statistical tools.

4.2.2. Sources of Data

The reliability of the sources of the data is extremely important in order to get the right results from the analysis and to make correct interpretations. Several sources were used in this work to collect data and all of them are well known organizations or websites.

First of all, International Monetary Fund (IMF) releases World Economic Outlook twice a year and the WEO which was released in October 2014 was one of the most important sources for this study. The usage of the website is very easy and filtering options make the data collection in less time consuming. The data of some of the potential determinants such as current account balance to GDP and investment to GDP were collected by using the WEO database in the website of IMF.

Secondly, the database of the World Bank was also extremely useful for gathering data. The data of several variables were found by the database of the World Bank. For instance, openness and real effective exchange rate values were found in this website.

Apart from these two huge databases, there are some other websites were used in order to complete the data points and to find some of the missing values. These websites were given in the references section. Furthermore, some variables do not exist in the desired form such as the rate of real international reserves to import. The simple excel operations were done in order to arrange the data in the desired form. Moreover, there are some problematic countries like Croatia because of the recent entrance to the EU. Especially, the external debt (%GNI) of Croatia is one of the hardest variables to find data. For Croatia, there were several other sources were found in Croatian websites and several analysis were done in order to become sure about the accuracy of the data. Finally, the dataset, which was constituted in a long period, was completed with elimination the missing values as much as possible.

5. Empirical Analysis

5.1. Definition of the Technique to Be Used for Testing the Hypothesis

5.1.1. Data Information

Collection of the data is generally followed by the statistical analyses and these analyses provide analysts to make interpretations and to find patterns related to data. It is the process of transforming a raw material into an end product and statistical analyses allow this transformation. From a different perspective, statistical analyses enable analysts to constitute qualitative interpretations by the help of quantitative techniques.

There are two main statistical methods which are applied to many kinds of data. The first one is regression analysis which is a kind of multivariate cross-sectional analysis to understand the behavior of a dependent variable by using and controlling the independent variables. In other words, the response variable is affected by the alterations in explanatory variables and regression analysis finds the effect rates of each explanatory variable. In addition, the number of measurements is important to obtain reliable reasoning as in many statistical techniques. The second mostly-used statistical method is the time series analysis which is based on observations of one or more variables over time. This analysis also provides to understand dynamic behavior of variables. However, in order to utilize this method in a successful way high number of observations is needed.

The data gathered to conduct this research contain the characteristics of both methods which are mentioned above. Mainly, the data include a dependent variable which is the current account balances of selected countries and many independent variables which are expected to explain the dependent variable. Up to this point, the data fit the description of the data in regression analysis. Nevertheless, the data have one more characteristic which is the time as years. Each country has observations of 19 consecutive years and the data resemble the time series data in these conditions as well. Hence, it can be said that the data work well with either regression analysis or time series analysis since its form is a combination of regression and time series data. However, some aspects of the data would be missed if one of these two was selected. Fortunately, there is another type of analysis which prevents biased results that come from ignoring one method and selecting another and provides good results if the data contain both regression and time series characteristics. The name of the analysis is “longitudinal data analysis” which works

well if the response variable depends on the explanatory variables and the time at the same time. Cross-section of independent variables over time can be explained by keeping the dynamic form of the data can be analyzed with this method effectively.

The longitudinal data analysis seems to be the best technique to analyze the data of this study but it is also good to know its advantages and disadvantages in order to understand the results in a better way. The longitudinal data analysis has many advantages and some disadvantages and the first advantage is that the repeated observations from the same subject are generally uncorrelated. This allows the longitudinal data analysis to give reliable outcomes with fewer subjects compared to regression analysis. In the case of this study, the number of countries may not be huge since repeated observations of each country are generally uncorrelated and each observation can behave completely different. The second advantage is each subject can control its variables and this provides to see the variation within a subject. Third, variation within and between the subjects can also be monitored and this enables to see the situations which are significant or out of control. Finally, the longitudinal data analysis keeps the dynamic behavior of data while maintaining the heterogeneity of the data (Frees, 2003).

On the other side, there are some drawbacks of longitudinal data analysis. The most important of them is called as panel attrition which is about missing values in general (Frees, 2003). In a data, which is generated in long term, there is a high probability of data sharing problems of subjects. Some subjects can refuse data sharing after a certain point; in some points, the data can be biased or missing. Therefore, a missing data may affect the results and mislead the interpretations. Therefore, this drawback should be eliminated as much as possible by selecting the subjects that have minimum probability of data sharing problems. Another weakness of this analysis is that some major events can change the behavior and the responses of subjects significantly in the data collection period (Apel, 2014). This kind of changes would disrupt the pattern of that subject obviously. Thus, it is good to select the subjects in time periods when they are seen as stable. Determination of the time span of this study is based on the stabilization of Turkish economy after 1995. Apart from Turkey, other countries have been chosen with respect to their stabilization levels. However, there can be some other major events about other countries in this research. These will be taken into consideration after obtaining the statistical outcomes and if there is a significant pattern change of a country, it is going to be explained.

5.1.2. Software Information

Analysis of the data is counted as the most crucial part of a research because it is a system or algorithm that transforms a collection of input into an interpretable output. Selection of methods to analyze the data is important but it cannot be implemented manually due to huge amounts of data and computations. Hence, a software program can help to analyze big data with respect to its area. A statistical software package is necessary for this research and Stata was selected to conduct the analysis part.

Stata is a statistical software package which includes many functions and tests inside. It is well accepted by the economy analysts as well as sociology and political science analysts. Since it is a well-known and widespread package among economists, the images and the results will be more familiar for economists who are interested in this subject. Moreover, it is a user-friendly package and its home page includes everything about operations.

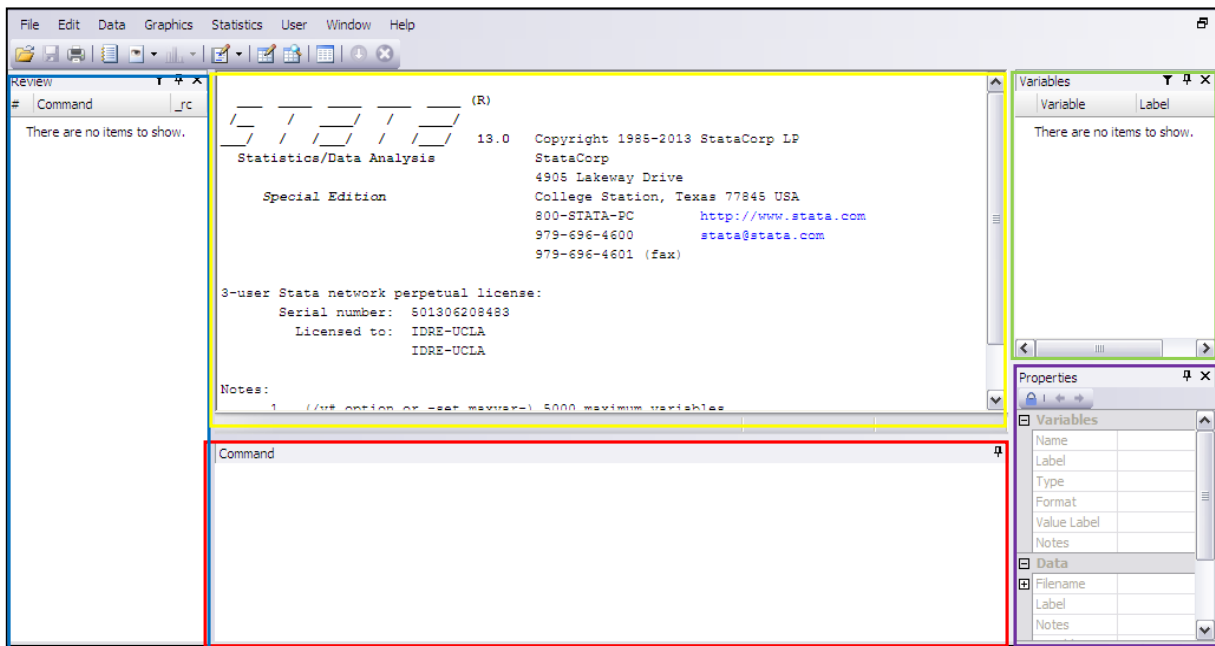


Figure 5. 1. Home page of Stata

In a nutshell, Stata consists of five main screens which can be seen in Figure 5.1 red rectangle is main screen where the commands are written to call the preset functions. Blue rectangle shows the previous commands. Green rectangle contains the variables which are included in the dataset. Purple rectangle is where the properties of variables which are selected in green rectangle can

be seen and modified. Finally, the yellow screen shows the outcomes of commands which need to be interpreted. In other words, it presents the end product according to the selected raw material and operations.

Stata also has a very useful manual at the help section. The commands and the functions are explained in a sufficient way in this document. In addition, there are many manuals and tutorials are available on the internet. Furthermore, there are some beneficial videos to understand the Stata environment visually. Indeed, Stata is not based only on commands and it provides predetermined statistical methods and tests under statistics section. There are abundant amount of statistical methods under this section and they can be called by a click. This also gives opportunity to work faster and error-free while conducting especially sensitivity analyses.

5.1.3. Statistical Technique Information

The data of this research is in the form of longitudinal panel data as it was stated in previous sections. In this section, the analysis of the data and the possible techniques are going to be discussed in detail.

First of all, the model which is going to be used for the panel data would be the regression model because of the robustness and simplicity of the regression analysis. The data is treated in a more reliable way in regression models and several possible misleading outcomes will be avoided by this way. Second, the past articles and studies always used regression models for this kind of data. For the sake of comparability issues between this model and the old models, regression must be used for analyzing the data. The general formula for the regression model for the panel data is described below.

$$y_{it} = \alpha + \beta' X_{it} + u_{it} \quad (18)$$

$$i = 1, \dots, N$$

$$t = 1, \dots, T$$

In the general formula y_{it} is the response variable and X_{it} is the explanatory variable where i is the country index and t is the year index. The intercept term is α and the coefficient for explanatory variables is β' . The random term is u_{it} . However, there are two main regression

models for the longitudinal panel data and these are fixed effects model and random effects model. These models have some differences in their applications.

Fixed effects model includes different intercept parameter for each individual while ignoring the time parameter. The regression equation for the fixed effects model is:

$$y_{it} = \alpha_i + \beta' X_{it} + e_{it} \quad (19)$$

According to this model, the intercepts of each individual is different and the error term is independent and identically distributed in $N(0, \sigma_e)$.

It is believed that if the functionally identical studies are included and if the aim is to find the common effects of the existing population, then the fixed effects model would be an appropriate preference (Borenstein, Hedges and Rothstein, 2007).

The other model is random effects model and it provides a common intercept term for all the individuals while adding another random term apart from the error term. The general form of the equation is:

$$y_{it} = \alpha + \beta' X_{it} + (e_{it} + u_i) \quad (20)$$

$$v_{it} = e_{it} + u_i \quad (21)$$

This model includes the random variable u_i for each individual and it combines u_i and e_{it} under the notation of v_{it} for the simplicity of calculations and better understanding.

If the researchers work independently for a data collection period, the individuals may carry different characteristics and it can damage the common effects between individuals. Hence, the usage of a mean of different distribution effects is more coherent. In this case, random effects model would provide more consistent results (Borenstein, Hedges and Rothstein, 2007).

The previous researches and models generally follow fixed effects model while modeling the current account balance. Nevertheless, in this research, both techniques will be evaluated and after careful analyses and interpretations, the final model is going to be determined. There are some tests and evaluation parameters for the results of these techniques and these are going to be discussed in the next section.

5.1.4. Procedures for Selected Technique

The procedure for the analysis section contains four major parts. The process starts with the unit root tests to check whether the variables are stationary or non-stationary. After handling the stationary issue, the regression parts take place and the model is set by the two main regression methods which are fixed effects and random effects. Third step is the decision of which model is better. The decision is made by the help of Hausman test. Finally, the analysis is going to be concluded by the further evaluation of Turkey.

The unit root tests are required to include the data in the correct way because the regression methods generally need stationary data in order to provide more consistent results. Thus, the behavior of each variable must be analyzed and if needed, the necessary transformations must be made.

There are many types of unit root tests and in order to keep consistency, the unit root tests were done by using Levin-Lin-Chu unit root test, which is widely used for testing the stationary behavior of the data.

The test contains null and alternative hypotheses:

H_0 : Panels contain unit roots

H_1 : Panels are stationary

The function for this test is called by the command of “xtunitroot llc variable_name”. It is anticipated to reject the null hypothesis in order to avoid any transformations to make the data stationary. However, when there are missing values in some of the variables, Levin-Lin-Chu test does not work. So, Im-Pesaran-Shin unit root test was applied to this kind of variables with the command of “xtunitroot ips variable_name”. The hypotheses are the same for this test as well.

When the data is not stationary, the first difference of the data should be taken and the test must be applied to this version of the data. Most probably, the non-stationary data would turn into stationary data after this operation.

Second part is the application of regression methods to the longitudinal panel data. Both fixed and random effects models must be applied because even if there may be some predictions about

which model is superior, further tests should be done in order to make sure which one is the correct method. Before running the regressions the data should be introduced as a panel data by the command of “xtset Countries Years, yearly”. Then, the regression commands come as “xtreg dependent_variable independent_variable1 independent_variable2 independent_variable3 ... ,re” for random effects model and “xtreg dependent_variable independent_variable1 independent_variable2 independent_variable3 ... ,fe” for the fixed effects model. The results are going to be analyzed in the next parts. In addition, the coefficient of determination (R^2) must be taken into consideration in order to have a better comprehension about how well the actual data fit the estimated regression line. Coefficient of determination takes values in between 0 and 1. It is desired to have values close to 1 for a good fit so that the model can be considered as a good reaction of the data. However, it does not say anything about the bias which can stem from the data and it does not guarantee that the model is adequate (Frost, 2013).

The third part includes the Hausman specification test for the post analysis of the methods. In order to conduct the Hausman test, the results of random effects model and fixed effects model the results must be stored in Stata consecutively. The test includes a p-value for the interpretations and the hypotheses are:

H_0 : Random effects model is appropriate

H_1 : Fixed effects model is appropriate

In the end, the specific analysis for Turkey is going to be made by the help of dummy variables and the significance of each variable is going to be analyzed deeply. Then, the differences and similarities will be interpreted and the study will be finalized. The details of analysis for Turkey will be explained in the “Situation of Turkey” section in a deeper way.

5.2. Data Analysis with Statistical Approaches

5.2.1. Unit Root Test Results

According to the unit root, test results for current account balance to GDP, GDP growth rate, real exchange rate, terms of trade, budget deficit to GDP, investment to GDP, openness, inflation volatility, real international reserves over import rate, export to GDP and gross national savings to GDP are stationary. These are all made by using Levin-Lin-Chu unit root test and all the p-values are less than 0.05. So, the null hypothesis-panels are non-stationary- is rejected.

Real interest rates and external debt stocks to GNI data have some missing values. Hence, Im-Pesaran-Shin unit root test applied to these data. According to the results, real interest rates data is stationary but the external debt stocks to GNI values are non-stationary. So, first difference of this data were taken and the test is applied again. The results were satisfactory since the first difference data are stationary and this difference data will be used in the further regression analyses if external debt stocks to GNI values are included in the model. The results of tests and p-values can be reached in the Appendix.

5.2.2. Hausman Specification Test

After determination of the variables and conducting final regression tests, the decision of which method is better than the other must be made. In order to do that, Hausman specification test is proposed by the articles and manual of Stata. This test evaluates the residuals of both methods and statistically states the better one.

This study was done many times and with various combinations of variables. The regressions were done with random effects model and fixed effects model. In the end, Hausman specification test was run and the p-value was 0 according to this test. So, the test suggests the rejection of the null hypothesis which supports random effects model and defends the alternative hypothesis which proposes fixed effects model is appropriate. The test results can be seen in the Appendix.

As a further notice, in the beginning of the research, the superiority of fixed effects over random effects was forecasted because of the heterogeneity of the countries and the analyses from the previous researches. Nevertheless, it is crucial to check if it is valid in this case or not because this is the first research which includes developing countries' current account balance modeling. Since it is a scientific research, the assumptions must be minimized and the facts and proofs must be maximized so that the accuracy of the research can be high.

5.2.3. Applied Runs and Selected Run

The determinants which need to be carefully analyzed by using the statistical methods are defined in the previous sections. The selected statistical method provides opportunities to test data in different perspectives. The panel data analysis helps users to measure the effects of variables on the same year of constant variable and implies a linear regression analysis to give

the general influence of each variable. On the other hand, it is possible to have lagged effects, especially in economic data. It means that previous year value of a variable can show its influence on the constant variable in next years. Therefore, it is important to implement lagged regression analysis to discover the realized effects of some variables. In order to prove that the statistical analysis conducted in both ways as the actual and one year lagged. As a result of that, it is discovered that some variables become significant only if the one year lagged effects are considered. As they are seen in the table, there are some variables whose effects change by the lag in a positive or a negative matter. The lag size has been selected as one to protect the consistency of data and to have a better interpretation; otherwise, the other parameters and decisions might have corrective or devastating influences on the variables.

Table 5. 1. *Results of first run*

Determinants of Current Account (%GDP)	Coefficient	Std. Err.	t	P> t	[95 % Conf. Interval]	
Persistence						
Current Account (%GDP) - L1.	0.593	0.044	13.33	0.000	0.505	0.680
Internal Conditions						
GDP Growth Rate	-0.115	0.021	-5.37	0.000	-0.157	-0.073
GDP Growth Rate - L1.	0.026	0.018	1.41	0.160	-0.010	0.062
Budget Deficit (%GDP)	0.017	0.028	0.59	0.555	-0.039	0.073
Budget Deficit (%GDP) - L1.	-0.043	0.028	-1.54	0.126	-0.097	0.012
Real Interest Rates	-0.002	0.007	-0.30	0.767	-0.016	0.012
Real Interest Rates - L1.	-0.008	0.007	-1.16	0.248	-0.022	0.006
Investment (%GDP)	-0.582	0.044	-13.36	0.000	-0.668	-0.496
Investment (%GDP) -L1.	0.283	0.053	5.37	0.000	0.179	0.387
Inflation Volatility	-0.100	0.002	-4.30	0.000	-0.150	-0.005
Inflation Volatility - L1.	0.001	0.002	0.47	0.636	-0.003	0.005
GNS (%GDP)	0.663	0.032	20.78	0.000	0.601	0.726
GNS (%GDP) - L1.	-0.359	0.045	-8.01	0.000	-0.447	-0.271
External Conditions						
Openness	-0.351	0.044	-8.06	0.000	-0.437	-0.265
Openness - L1.	0.233	0.043	5.41	0.000	0.148	0.317
Export (%GDP)	0.716	0.084	8.53	0.000	0.551	0.881
Export (%GDP) - L1.	-0.471	0.084	-5.59	0.000	-0.637	-0.305
REER	0.005	0.011	0.49	0.625	-0.017	0.027
REER - L1.	-0.006	0.011	-0.57	0.569	-0.029	0.016

External Debt (%GNI)	-0.011	0.009	-1.160	0.245	-0.030	0.008
External Debt (%GNI) - L1.	0.012	0.009	1.360	0.174	-0.005	0.029
Terms of Trade	-0.014	0.010	-1.430	0.155	-0.034	0.005
Terms of Trade - L1.	-0.002	0.010	-0.170	0.867	-0.021	0.018
Sustainability Related						
Import Coverage Ratio	0.060	0.047	1.290	0.199	-0.032	0.152
Import Coverage Ratio - L1.	-0.056	0.044	-1.280	0.202	-0.142	0.030

Another issue, which needs to be focused on, is the coverage area of the variables. If some variables overlap, which means that a determinant covers the same area with another, this situation can create a bias in the system and shrink the significance of the related variables. In the initial run, there are some variables, which fit this definition, because these determinants are collected from different articles and they might be targeting to check the same effect with another variable. For example, in the first run, openness rate and export (%GDP) are highly correlated variables and serve almost the same purpose. Thus, it is logical to deduce the export variable from the analysis in order to eliminate the problem because its effect on the current account balance is very obvious compared to openness level. In addition, it is possible to observe a similar relation between terms of trade and real effective exchange rate (REER). Many articles in literature put the REER variable into the center of research while analyzing the determinants of current account balance; however, the influence of REER on current account balance reveals as insignificant in many studies. The reason for insignificance might be the volatile structure of REER. Moreover, the REER should not have a direct effect on current account, since it affects, firstly, the trade prices which might determine the trade levels of countries. In this matter, it is more critical to test the effect of terms of trade variable rather than REER on current account balance. The last determinant which should be considered once more is the external debt stocks. As it can be seen in the table, the result of “external debt stock” is statistically insignificant both for lagged and actual comparison. Besides that the external debt stocks values have resulted in non-stationary according to the unit-root test applied, which requires the transformation of data to be stationary by taking the difference of yearly values. Nevertheless, the results even with the difference of yearly values are not significant and also decrease the observation number which might create more problems instead. On the other hand, external debt stocks’ data is the column with highest missing value number within entire panel data; therefore, it has been decided to deduce external debt stocks determinant, which is already found as insignificant, from the

research. By the deduction of overlapped variables, the desired set of variables to be tested is determined. While deciding the best model, the coefficient of determination (R^2) was also taken into consideration.

5.2.4. Situation of Turkey

Deeper analysis for Turkish current account balance is made in order to understand if there is any difference between the Turkey and the other countries. Hence, additional dummy variables were included into the model and the regressions were run again with these dummy variables.

To see the general effect of Turkey, a binary dummy variable was added. It is “1” for Turkish data and “0” for the others’ data. When this dummy variables are included in the model, it is possible to see whether the Turkish current account balance depends on the independent variables in the model significantly different than the others or not. If the p-value of the dummy variable is greater than the critical p-value which is accepted as 0.05 then it can be deducted that Turkey follows the same pattern with the other countries in terms of the model of the current account balance. On the other hand, if the p-value is smaller than 0.05, then it means that there is a significant difference between the current account deficit models of Turkey and the other developing countries.

In a similar way, the behaviors of different variables can be analyzed. The values of dummy variables should be the same value with the real values of explanatory variables for Turkey. The values of the dummy variable should be again “0” for the other countries so that the different patterns can be captured by checking the variables one by one. If the p-values of dummies less than 0.05, then there would be significant differences between the values of Turkey and the other countries while explaining the current account balance. This is important to catch the country-specific effects because even if this study tries to group and analyze the countries with similar backgrounds and conditions, it is not possible to control every variable and the variables that are not in control can affect the result of the variables which are inside the model. Thus, detailed interpretations can be done after the specific dummy analysis. Otherwise, if the p-values of dummies are greater than 0.05, then it can be concluded that the variable, which is under check with a dummy variable, does not show a different behavior compared to the same variable of the other 19 countries.

5.3. Gathering the Results

The dependent variable “Current Account Balance” has been decided as a ratio to gross domestic product. In order to analyze the structure of current account balance, the set of core explanatory variables with 10 variables and 352 observations of 20 countries are selected as final determinants. They are the lagged current account balance, the domestic output growth, the real interest rate, the terms of trade index, the budget deficit with respect to GDP, investment with respect to GDP, openness level, inflation volatility, import coverage ratio and gross national savings with respect to GDP. Most of the explanatory variables are the endogenous, except for terms of trade and openness, which are more correlated to exogenous factors.

The first final run has operated in order to measure the effects of each variable on the general data set without separating countries individually. The software tries to define optimal regression for all panel data set, which gives us idea about the general influence of a determinant on the set of developing countries. Table 5.2 demonstrates the results of this run as following:

Table 5. 2. *The results of final run for entire data set*

Fixed-effects (within) regression				Number of obs = 352		
Group variable: Countries				Number of groups = 20		
R-Square:				Obs per group:		
within = 0.9540				min = 13		
between = 0.9428				avg = 17.060		
overall = 0.9366				max = 18		
corr(u_i, Xb) = -0.5717				F(16,316) = 409.43		
				Prob > F = 0.000		
Determinants of Current Account (%GDP)	Coefficient	Std. Err.	t	P> t	[95 % Conf. Interval]	
Persistence						
Current Account (%GDP) - L1.	0,528027	0,04389	12,03	0,000	0,441674	0,614381
Internal Conditions						
GDP Growth Rate	-0,067334	0,020658	-3,26	0,001	-0,10798	-0,02669
Real Interest Rate	0,044594	0,006895	0,65	0,518	-0,00911	0,018025
Real Interest Rates - L1.	-0,022467	0,006717	-3,34	0,001	-0,03568	-0,00925
Budget Balance (%GDP)	0,055079	0,029555	1,86	0,063	0,00307	0,049182
Budget Balance (%GDP) - L1.	-0,085595	0,028979	-2,95	0,003	-0,14261	-0,02858

Investment (%GDP)	-0,843382	0,032171	-26,22	0,000	-0,90668	-0,78009
Investment (%GDP) -L1.	0,418213	0,049557	-8,44	0,000	0,320709	0,515717
Inflation Volatility	-0,006482	0,001968	-3,29	0,001	-0,01035	0,002609
GNS (%GDP)	0,815904	0,028897	28,24	0,000	0,75905	0,872759
GNS (%GDP) - L1.	-0,390365	0,045873	-8,51	0,000	-0,48062	-0,30011
External Conditions						
Terms of Trade	0,031474	0,008572	3,67	0,000	0,014608	0,04834
Terms of Trade - L1.	-0,027655	0,008563	-3,23	0,001	-0,0445	-0,01081
Openness	0,006634	0,004262	1,56	0,121	-0,00175	0,015019
Sustainability Related						
Import Coverage Ratio	0,090287	0,047011	1,92	0,056	-0,00221	-0,18278
Import Coverage Ratio - L1.	-0,089942	0,044985	-2,00	0,046	-0,17845	-0,00143

The next session is dedicated to the interpretation of results, specifically for each determinant; however, another run has also been operated to analyze Turkey case by adding dummy variables. In this way, it is aimed to determine if Turkey differentiates from the set of developing economies and how it differentiates.

The gathered results for Turkey case are as following:

Table 5. 3. *The results for Turkey specific case*

Determinants of Current Account (%GDP)	Coefficient	Std. Err.	t	P> t	[95 % Conf. Interval]	
General Similarity of Turkey	-0,113965	0,399768	-0,29	0,776	-0,8975	0,66956
Persistence						
Current Account (%GDP) - L1.	0,662163	0,09246	0,72	0,474	-0,1157	0,24813
Internal Conditions						
GDP Growth Rate	0,092742	0,057778	1,61	0,109	-0,02094	0,20642
Real Interest Rate	-0,395826	0,362135	-1,09	0,275	-1,10835	0,31669
Real Interest Rates - L1.	0,868854	0,356943	0,24	0,808	-0,61542	0,78918
Budget Balance (%GDP)	0,019374	0,09258	0,21	0,834	-0,16278	0,20153
Budget Balance (%GDP) - L1.	-0,013955	0,094412	-0,15	0,883	-0,19972	0,17170
Investment (%GDP)	0,170041	0,112782	1,51	0,133	-0,05186	0,39194
Investment (%GDP) -L1.	-0,013205	0,109398	-0,12	0,904	-0,22845	0,20204
Inflation Volatility	0,010643	0,00893	1,19	0,234	-0,00693	0,02821
GNS (%GDP)	0,204485	0,17218	1,19	0,236	-0,13429	0,54325
GNS (%GDP) - L1.	-0,08057	0,170252	-0,47	0,636	-0,41555	0,254411

External Conditions						
Terms of Trade	-0,045261	0,02076	-2,18	0,03	-0,08611	-0,00442
Terms of Trade - L1.	0,00754	0,021488	0,35	0,726	-0,03474	0,049819
Openness	-0,005813	0,049102	-0,12	0,906	-0,10242	0,090796
Sustainability Related						
Import Coverage Ratio	-0,563641	0,348676	-1,62	0,107	-1,24968	0,122395
Import Coverage Ratio - L1.	0,037276	0,353613	0,11	0,916	-0,73303	0,658474
	Within	Between	Overall			
R-sq. General Similarity	0.9463	0.9950	0.9730			

The row of general similarity of Turkey illustrates the coherence of Turkey's data with the total data set. P-value of this row points out that the difference of Turkey from the developing countries in the data is insignificant, which means that Turkey is affected by the selected determinants, mostly same as the other countries.

5.4. Discussion of the Results

Regarding the determined equation to analyze the influences of explanatory variables on the dependent variable, the results of statistical technique can be interpreted according to the coefficient and p-value which indicate successively the magnitude of effects and the significance.

The research is being conducted to analyze Turkish current account balance through the comparison between the developing countries' determinants and Turkish economic variables. In that matter, it is important to measure how Turkish economy is coherent with the underdeveloped countries. The second row "General similarity of Turkey" in the Table 5.3 clarifies that there is not any statistical evidence found to reject the similarity of Turkey with other countries since its p-value is over the threshold value "0.05". It means that usually the results of entire panel data will be valid also for Turkey case.

The one-year lagged current account balance with respect to GDP: This determinant is usually used for measuring the persistence of current account balance. It investigates if current account balance follows a trend line or not. The results of final run for entire data set point out that the current account balance is highly and significantly depended on the last year current account performance which means that the current account balance is excessively persistence. The statistical values in Table 5.2 demonstrate that 1 percentage increase at last year current account balance leads to a rise about 0.53 percentage point in the following year's performance.

In other words, if an economy results in a higher current account deficit in a specific year, it will also affect the next year performance towards higher current account deficit.

The outcomes related to persistence of current account balance in Turkey given in Table 5.3 illustrate that the scenario is also not different for Turkey in that matter. The p-value 0.474, which is higher than the threshold value 0.05, highlights that the Turkey's data are not statistically diverse from the entire data set. Therefore, it is logical to expect a persistent performance also for Turkish current account balance same as the developing countries.

GDP Growth Rate: This variable is usually admitted as the most relevant indicator for economic development level of a country. Countries strive for the increase of GDP and current account balance due to the trade account is one of the main contributors of domestic production. The import of semi-product for manufacturing and the export of final goods are very critical. The analysis shows that 1 percentage rise of GDP growth rate causes a current account balance fall of 0.07 percentage points, which means that the growth leads the current account balance of developing countries to the deficit. The case for Turkish economy is also not different from the developing countries. The situation can be interpreted as that the growths of the economies in the data set are mostly depended on the import.

The growth rate can also be associated with the income level of economies. It is expected that an ascent in income level should raise the savings' level which results in better current account balance. However, Calderon, Chong and Loayza explained the situation as that the correlation of the growth seems higher with investment rate compared to with the savings rate, thus leading to a worsening of the current account balance. On the other hand, it must be taken account that the economies in this data set are developing countries, which need higher investment rates and the import of technologies and some materials to develop; nevertheless, the case could be different if the growths were originating from productivity improvement.

Real Interest Rates: Real interest rate is an indicator which is highly correlated with inflation but furthermore, the outcome of nominal interest rate in control of central banks. The central banks may prefer to raise interest rates in order to attract foreign capitals; however, it also encourages purchasing of domestic or foreign goods and securities due to the downfall of real demand for money.

The outcomes of the analysis illustrate that 1 point rise of interest rates leads to a 0.022 point deficit in current account as lagged effect. It proves that the increase of interest rates is worsening the current account balance. This might be also a fact about the sustainability of current account deficit because more foreign capitals mean more resources to sustain the current account deficit which is triggering the surge of purchases mentioned before. Moreover, the results of Turkey case also indicate the same influence on the economy.

Terms of Trade: The results of the analysis point out that the effect of the terms of trade volatility on the current account balance does not have certain direction. The coefficients of the exact year and the lagged have different signs, which indicate that the influence of the terms of trade changes by the year. However, the situation can be interpreted according to HLM effect.

The HLM effect emphasizes that an increase in terms of trade raises the real income of a country. Under the assumption of constant marginal consumption slope, it is expected a surge in savings, which improves the current account balance as it is in this analysis. According to the results, 1 percentage ascent of terms of trade leads to a current account balance improvement of 0.03 point. Nevertheless, the HLM theory points out to the temporariness of the rise. If the expectance of continuity in terms of the determinant exists, the economic units revise their income upwards, which causes no increase in savings. Moreover, the increase of export prices in higher pace than import prices would cause a decrease in export and a rise in import worsening the current account balance. This conclusion appears in our analysis as the -0.03 percentage points of lagged terms of trade data's coefficient.

“Terms of trade” variable differentiates from the other determinants because it provides significantly different results for Turkey case while all others do not. According to the p-value of the lagged terms of trade data, Turkey is statistically diverse from the other developing countries since it seems that the an upward terms of trade shock influences the Turkish current account balance in a negative way from the beginning, although the effect diminishes in a year. The consequence is quite important because it rejects the validity of HLM effect on Turkey case and supports the result of one of the rare research about HLM effect in Turkey conducted by Yamak and Korkmaz (2006). Yamak and Korkmaz emphasize that the substitution effect of terms of trade shocks is stronger than its income effect in Turkey case (2006).

Budget Deficit: The budget deficit is one of the most complex explanatory variables because Keynesian perspective suggests the twin deficits hypothesis which emphasizes that the budget deficit causes the current account deficit. Usually, the twin deficits are very common and what is expected; however, our results showed that there is no proof to support the hypothesis for developing countries in this specific time span. Moreover, the coefficient for the lagged budget balance indicates that the budget balance and the current account balance have negative correlation with each other. 1 percentage rise in budget balance results in a fall of 0.09 percentage point in the current account balance. The findings also point out that the scenario is not different for Turkish economy.

The outcomes can be explained over Turkish economy because it is the focus point of the research. The graphs and information belong to these determinants are given in the previous section. Main income resources of government budgets are taxes, but particularly, developing countries are highly depended on taxes taken by import. The share of import taxes in the Turkish government revenues is around 20%, which means that it is one of the most critical income items.

It can be said that the current account balance is the dominant one within the causality of these two variables. The protective steps in order to decrease the current account deficit, which are particularly the import descending policies, induce a budget deficit through the fall of revenues from import taxes.

Investment: As it is given before, there are some related approaches suggest that the current account balance is excessively correlated with investments and savings. The outcomes of this research are also proving these approaches. 1 percentage point surge of investment rate leads to a current account deficit rise of 0.84 percentage points. Furthermore, there has been no proof found indicating the consequences are diversified for Turkish economy. However, the surprising point in the results is the sign of the lagged coefficient of investments. It shows that the effect of investment reverses on the following year which creates a challenging research area. The only logical explanation of this fact, for now, is that the developing countries are mostly doing short-term investments, which provide quick returns improving the current account balance.

Gross National Savings: Before interpreting the outcome of this variable in detail, it should be considered that the savings and investments are excessively correlated with each other.

According to well-known Feldstein-Horioka (FH) approach, the correlation of investment and savings are equal and negative which means that they move together both in the opposite direction (Ventura, 2001). The value of the coefficient proves that the savings in developing countries are affecting the current account balance positively at almost identical magnitude with investment (0.82) as it is expected. In addition to that, it is obvious that the same relationship continues for the lagged values. The lagged coefficient of savings seems to be worsening the current account balance. As it is in the investment issue, this case can be also another new research area. On the other hand, the reasonable explanation is that most likely, the developing countries, which are highly dependent on the import, are using even their savings, especially, private savings to the import for the following year. Therefore, the reachable result is that the usage of savings to the import might trigger current account deficits.

Openness: Being formed by the trade and growth items makes the openness level one of the significant expected determinants; however, the p-value of the openness level indicates that there is no statistical evidence to consider it as a determinant for current account balance. The cause of this result may be the uncertainty of openness' growth direction. A growth in openness level can be caused by either increase in export or in import which creates the uncertainty in terms of affecting the current account balance.

Inflation: Inflation simply means the change of goods price levels in an economy which also covers the price level of export goods. The results of analysis illustrate that 1 percentage rise of price levels leads to a current account balance fall of 0.007 percentage point by affecting the export goods' price level. The conditions are not also different for Turkey. The price level rises without an improvement in quality damage to the export level of an economy, thus worsening the current account balance.

Import Coverage Ratio: As it is mentioned before, the import coverage ratio is one of the main indicators of reserves' adequacy in an economy. Import coverage ratio simply demonstrates how long an economy can sustain its current account deficit without any external aid. In this matter, the height of the import coverage ratio might encourage economies to take more risk about the current account deficits.

The outcomes indicate that there is a difference between the instant and lagged effects of this determinant. The actual coefficient for the exact year shows that 1 percentage increase in import

coverage ratio results in 0.115 percentage rise despite being insignificant, but lagged coefficient points out a 0.106 point fall for the following year with statistical evidence. An increase in reserves indicates that the economic units reduced or postponed its external expenditures and it makes positive influence on current account balance. However, the abundance expectation in terms of reserves reveals the mentioned encouragement effect for the following year in developing countries. Moreover, the results also prove that the case is valid for Turkey.

6. Conclusion

6.1. Final Conclusion

Economic analyses are getting more important and more reliable with globalization and rise of accessible data. Economic indicators and the conditions of almost all countries in the world were very complicated and instable 20 years ago since the after effects of the World War II and dissolution of the Soviet Union. However, the dramatic improvements in many areas -especially in technology- lead the world to a more stable environment. Hence, countries could focus on the developments and control their economies. In addition, accessibility of the data of the countries were increased in the last decades due to high-technology data storage systems. These milestones make the economic analyses and models more important because the world is highly dependent on the economy today. The most critical element of the future of a country is its economy. Modeling of economic variables has utmost importance nowadays in order to forecast the future and take the precautions now if needed.

There are numerous economic variables which a country wants to see the pattern and control. Current account balance is one of the most crucial variables and its importance is rising with the globalized economies. Today, many economies are open to trade and each country tries to benefit from the trade. Deficit in the current account balance is generally perceived as a negative signal because that means the country is importing more and exporting less. Nevertheless, recent studies have shown the dependency of current account balance on savings and investments. Therefore, a deficit may not be a negative signal and may be an indicator of high number of investments which will generate money in future. Thus, countries should be extremely meticulous while interpreting the current account balance. The variables which the current account balance depends on must be observed in depth and their effects must be explained. Furthermore, there are some studies which tried to model the current account balance but

generally they are for developed countries. This study reflected the situation for the developing countries which show more different characteristics than developed ones and also the variance of their variables are slightly higher. Since there are many developing countries today, it is inevitable to model the current account balances of these countries to enlighten its secrets.

This research has modeled the current account balance of 20 developing countries which were selected based on the proximity to Turkey's GDP and openness levels. The reason behind the selection of Turkey as a base country is to intention of investigating the variables specifically for Turkey. 19 years-data of 20 countries were gathered and analyzed by the help of Stata software. According to the results, there are some outcomes that are unexpected besides the expected ones. When the situation of the developing countries is considered, it is clear that the results cannot fit with the results of developed countries exactly. Thus, the necessary explanations and interpretations for all the variables were completed and Turkey's circumstances were analyzed in detail. Turkey's results did not show a significantly different behavior and this means that the median country among the selected countries does not follow a different pattern than the others. It is also critical for validity of the country selection process because if it shows great differences, then the similarity between the selected countries can be discussed and the reliability of the results can be diminished.

According to the results, the variables which affect the current account balance more than the others are investment and GNS. The outcomes support the saving-investment approach which expresses the dependency of current account balance on the saving and investment. Investment leads to the deficit in the short term but the lagged version of it creates a surplus. On the other hand, GNS brings good surplus rates in the short term but causes deficit for the lagged effect. This is probably because of the rapid policy changes of developing countries. Moreover, current account balance of the previous year has a big impact which tries to keep the trend. If there is a deficit last year, it leads a higher deficit this year. In addition, if there is a surplus last year, the tendency would be higher surplus this year. Furthermore, openness became insignificant which is not surprising because openness includes both export and import rates which directly influence the current account balance oppositely. Apart from these variables, terms of trade have a positive coefficient but it is smaller than the previous ones. GDP growth rate, lagged budget

deficit, inflation volatility, lagged terms of trade, lagged import coverage rate and lagged real interest rate have negative coefficients in the equation of current account deficit in this analysis.

Developing countries that suffer from a high current account deficit must pay attention to their GNS levels and they could try to increase their savings rates in order to diminish the deficit. Moreover, these countries had better to look at the source of deficit. If the deficit stems from high investment rates, then it would probably transform into a surplus in the following years. The coefficient of the lagged investment variable supports this idea as well. Indeed, these countries would take some precautions by controlling other variables but it is more useful to focus on the savings and investment to obtain significant movements.

All things considered, it can be said that the analyses lead the research to a consistent field of interpretations and these interpretations can be useful for the current account balance controlling and planning operations of developing countries. If the significant variables can be controlled in a wise way, then the various movements of current account balance are no longer seen as a threat. In other words, this research gave a different understanding of current account balance of developing countries.

6.2. Further Research Questions

This research tries to generalize the effects of possible variables to the current account balance of developing countries which are selected based on their GDP and openness levels. The weights of these effects for the Turkish current account balance were also compared to the general effects. Indeed, the research can be developed by additional inclusions and questions. Several suggestions are listed below for further analysis and interpretations:

- The results are valid for the countries that were selected carefully and it is stated that it can be generalized for all developing countries. In order to consolidate the found effects, the analysis can be extended by introducing more developing countries.

- There are abundant amounts of variables which might affect the current account balance of developing countries. However, approximately 10 of them were included in this research. Some other significant variables can be found with a more detailed exploration.

- The data can be taken quarterly in order to increase the data points and reduce the variance.

- The country-specific effects which can stem from the historical events, economic or political decisions and natural disasters can be manipulated by adding some dummies or weights to the years that the variables have been affected. This arrangement would probably make the research better.

- As the lagged effects of the investment and GNS are found as unexpected and never explained before, a new research can be conducted to investigate discriminative reasons of the outcome for these countries in detail.

- The validity of HLM effect on Turkey can be tested with more data in order enlighten the causes since it is the point of diversification for Turkish economy from the other developing economies.

There can be additional ideas and suggestions for the improvement of this research. Nevertheless, it is a complete study according to its aim and it is believed that it is going to be used as a reference for the further researches.

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Appendix

Unit Root Tests

Current Account (%GDP)

```
Levin-Lin-Chu unit-root test for CurrentAccountGDP
-----
Ho: Panels contain unit roots          Number of panels =    20
Ha: Panels are stationary              Number of periods =   19

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included
Time trend:  Not included

ADF regressions: 1 lag
LR variance:  Bartlett kernel, 8.00 lags average (chosen by LLC)
-----
                Statistic      p-value
-----
Unadjusted t    -9.4030
Adjusted t*     -2.7419          0.0031
```

GDP Growth Rate

```
Levin-Lin-Chu unit-root test for GDPGrowthRate
-----
Ho: Panels contain unit roots          Number of panels =    20
Ha: Panels are stationary              Number of periods =   19

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included
Time trend:  Not included

ADF regressions: 1 lag
LR variance:  Bartlett kernel, 8.00 lags average (chosen by LLC)
-----
                Statistic      p-value
-----
Unadjusted t    -12.7334
Adjusted t*     -6.5400          0.0000
```

Real Exchange Rate

```
Levin-Lin-Chu unit-root test for REER2007100Broad
-----
Ho: Panels contain unit roots          Number of panels =    20
Ha: Panels are stationary              Number of periods =   19

AR parameter: Common                  Asymptotics: N/T -> 0
Panel means:  Included
Time trend:  Not included

ADF regressions: 1 lag
LR variance:  Bartlett kernel, 8.00 lags average (chosen by LLC)
-----
                Statistic      p-value
-----
Unadjusted t    -8.3331
Adjusted t*     -5.2405          0.0000
```


Terms of Trade

Levin-Lin-Chu unit-root test for TermsofTrade2000100

Ho: Panels contain unit roots Number of panels = 20
 Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
 Panel means: Included
 Time trend: Not included

ADF regressions: 1 lag
 LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-7.1547	
Adjusted t*	-2.5776	0.0050

Budget Balance

Levin-Lin-Chu unit-root test for BudgetDeficitGDP

Ho: Panels contain unit roots Number of panels = 20
 Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
 Panel means: Included
 Time trend: Not included

ADF regressions: 1 lag
 LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-12.7909	
Adjusted t*	-7.8835	0.0000

Investment (%GDP)

Levin-Lin-Chu unit-root test for InvestmentGDP

Ho: Panels contain unit roots Number of panels = 20
 Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
 Panel means: Included
 Time trend: Not included

ADF regressions: 1 lag
 LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-8.9743	
Adjusted t*	-3.4403	0.0003

Openness

Levin-Lin-Chu unit-root test for Openness

Ho: Panels contain unit roots Number of panels = 20
Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-5.5345	
Adjusted t*	-2.3569	0.0092

Inflation Volatility

Levin-Lin-Chu unit-root test for InflationVolatility

Ho: Panels contain unit roots Number of panels = 20
Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-14.1198	
Adjusted t*	-6.2889	0.0000

Real International Reserves over Import

Levin-Lin-Chu unit-root test for RealInternationalReservesImp

Ho: Panels contain unit roots Number of panels = 20
Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag
LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-6.4799	
Adjusted t*	-2.5814	0.0049

Export (%GDP)

Levin-Lin-Chu unit-root test for ExportGDP

Ho: Panels contain unit roots Number of panels = 20
Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag

LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-5.7229	
Adjusted t*	-2.2533	0.0121

Gross National Savings

Levin-Lin-Chu unit-root test for GrossNationalSavingsGDP

Ho: Panels contain unit roots Number of panels = 20
Ha: Panels are stationary Number of periods = 19

AR parameter: Common Asymptotics: N/T -> 0
Panel means: Included
Time trend: Not included

ADF regressions: 1 lag

LR variance: Bartlett kernel, 8.00 lags average (chosen by LLC)

	Statistic	p-value
Unadjusted t	-8.1175	
Adjusted t*	-3.3182	0.0005

Hausman Test

```
. hausman FIXED .
```

	Coefficients		(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
	(b) FIXED	(B) RANDOM		
L.CurrentA~P	.5280273	.8429718	-.3149445	.0333728
GDPGrowthR~e	-.0673335	-.0566661	-.0106673	.
RealIntere~s	.0044594	.0054044	-.000945	.
Term~2000100	.0314736	.037983	-.0065094	.
BudgetBala~P	.0550786	.079389	-.0243104	.
Investment~P	-.8433824	-.8433205	-.0000619	.
Openness	.0066336	.0025099	.0041237	.0036579
InflationV~y	-.0064818	-.007267	.0007851	.
RealInter~0x	.0902869	.0879788	.0023082	.
GrossNatio~P	.8159042	.7683986	.0475056	.
L.RealInte~s	-.0224672	-.0154877	-.0069795	.
L.Te~2000100	-.0276546	-.0275462	-.0001084	.
L.BudgetBa~P	-.0855948	-.0859399	.0003452	.
L.Investme~P	.4182129	.7281324	-.3099195	.0325522
L.RealInt~0x	-.0899421	-.1102298	.0202877	.
L.GrossNat~P	-.390365	-.6590887	.2687237	.0272023

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(16) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 90.13
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)