ABSTRACT

KOKSAL, ISMAIL. Essays on the External Debt of Turkey. (Under the direction of Dr. Kathryn A. Boys).

This study analyzes external debt in Turkey and assesses, whether or not it contributes to economic growth. As the United States (U.S.) is the major holder of Turkey's debt, the effects of the changes in the balance sheet of the US Federal Reserve, which is an indicator of expansionary or contractionary U.S. monetary policy, on the external debts and loan types in Turkey are also examined. We find that, since 2003, the ratio of the private sector's gross external debt stock to GDP ratio has increased, while the ratio for public sector stock of debt relative to GDP has not changed. This may lead the private sector to be exposed to a significant foreign exchange rate risk and causes an increase in economic vulnerabilities in the Turkish economy. In addition, we find that external debts have a long-term, negative, causal effect on GDP growth of the Turkish economy. Finally, the empirical results reveal that there is a negative relationship between the FED's expansionary monetary policies and external debts of Turkey.

Essays on the External Debt of Turkey

by
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DEDICATION

I would like to dedicate this study to my precious family and my lovely children Ada and Hasan Alp.

BIOGRAPHY

Ismail Koksal was born in 1980 in Aksaray, Turkey. His Bachelor of Science Degree in finance is from Ankara University. After graduating, in 2004 he started to work as a tax auditor at the Ministry of Finance. Then, in 2005, he changed his job and started to work as a bank auditor at Ziraat Bank which is the biggest bank of Turkey by assets. Finally, he succeeded in a highly competitive selection pool for a position with the Undersecretariat of Treasury (later the Ministry of Treasury and Finance) as a treasury expert in 2009. Over his professional carrier at the Treasury, Mr. Koksal's focus has been on issues related to the external debt of the Republic of Turkey. In this regard, especially in the field of external debts, he managed all kind of external debt transactions provided by international organizations such as the World Bank, The European Bank for Reconstruction and Development, The Council of Europe Development Bank, Islamic Development Bank, Agence Française de Développement, among others. Mr. Koksal has also worked as a Deputy Chairman of Human Resources, then as the Head of Strategical Development Department at the Undersecretariat of Treasury. He graduated from the NCSU Poole College of Management in 2019 with a high degree of success in all courses and earned a Master of Science degree in economics.

ACKNOWLEDGMENTS

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INTRODUCTION

Theoretical models suggest that “reasonable” levels of borrowing by a developing country are likely to enhance its economic growth, both through capital accumulation and productivity growth. If a country uses the borrowed external funds for productive investment, economic growth could increase and allow for timely debt repayments (Pattillio et al. 2002). Conversely, however, “debt overhang” theories suggest that if there is some likelihood that this debt will be larger than the country’s repayment ability in the future, the large levels of accumulated debt lead to lower economic growth (Krugman, 1988).

During the1990s, policymakers and public opinion focused on the high external indebtedness of developing countries (Pattillio et al. 2002). After this decade, foreign currency liabilities were often perceived as a financial weakness particularly in developing and underdeveloped economies. It is widely believed that these debts exacerbated the severity of the Mexican tequila crisis of 1994, the Russian Ruble crisis of 1998 and the East Asian crisis in the late 1990s (Eichengreen and Hausmann, 1999). Furthermore, in the wake of the recent European financial crisis of 2007-2011, many advanced European countries have taken austerity measures to reduce levels of both external and sovereign debt (Cuestas et al. 2015). After these financial crises, unhedged exposure to debts denominated in foreign currency has substantially decreased. Instead, borrowing governments tend to issue local-currency denominated debt on international markets (Burger and Warnock, 2006).

In addition, private sector debt is a beneficial and essential part of an economy. As it increases, however, it can introduce some challenges. The first problem is that very rapid or “runaway” private debt growth often brings financial crises. Runaway private debt growth contributed the 2008 crisis in the United States, the 1991 crisis in Japan, and the 1997 crisis across

Asia. The second problem is that, when too high, private debt becomes a drag on economic growth. A growing body of research suggests that when private debt enters the range of 100 to 150 percent of GDP, it impedes economic growth (Vague, 2016).

This study aims to contribute to the current understanding of external debt in Turkey and its impact on Turkey's economic growth. In the course of this analysis, the impact of the United States Federal Reserve (FED) policies on Turkey's external debt will also be explored.

The rest of the paper is organized as follows. In Chapter 1, the sustainability of external debt of Turkey is discussed. The question of whether or not external debt contributes to the economic growth of Turkey is examined with an empirical model in Chapter 2. Chapter 3 uses an econometric model to explore how the FED's policies affect the external debt in Turkey. Finally, Chapter 4 draws general conclusions and offers suggestions for future research.

CHAPTER 1

THE ANALYSIS OF EXTERNAL DEBTS IN TURKEY

According to the International Monetary Fund (IMF, 2014), *"gross external debt, at any given time, is the outstanding amount of those actual current, and not contingent, liabilities that require payment(s) of principal and/or interest by the debtor at some point(s) in the future and that are owed to nonresidents by residents of an economy"(p.5).* This definition explains that external debt is the total debt a country borrows from foreign capital markets such as other countries, foreign or international financial institutions, foreign corporations or citizens.

1.1. A Brief History of Turkey's External Debts

Turkey's external debt has been one of the most important economic issues not only during the Ottoman Empire (1854-1920) but also during the Republic period (1920-). The first foreign borrowing agreement in Turkish history was signed with the British Empire in August 1854[1]. After this date, the Ottoman Empire borrowed from Britain and France 15 times in the subsequent 21. As of 1875, the total amount of external debt (the cumulative of principal and interest amount) was 11 million Pounds. To put this into context, the total state revenue of the Ottoman Empire was about 18 million Pounds. By 1875, the sustainability[2] of the increasing external debt stock had deteriorated, and the Ottoman Empire announced to stop of all debt repayments (Kıray, 1995; Özsoylu, 1999). A debt office called "Duyunu Umumiye" was established in 1881. With this institution, the Ottoman Empire lost its economic independence by allowing creditors to directly manage state tax and revenues. The external debts that remained from the Ottoman Empire period

[1] Creditors were Palmer & Co. from London and Gold Schmidt from Paris.

[2] According to the IMF (2001), *"A country can be said to achieve external debt sustainability if it can meet its current and future external debt service obligations in full, without recourse to debt rescheduling or the accumulation of arrears and without compromising growth (p.4)."*

were among the most important economic problems for Turkey, and that debt stock was finally repaid in 1954 (Özsoylu, 1999).

In the post-Republic period, a $10 million credit borrowed from the U.S. in 1930 for the "economic mechanization" was the first external debt of the Turkish government (Olcar, 2013). While Turkey did not enter World War II, however, at the beginning of 1940s some external debt was used to prepare the country for the possibility of going to the war. In the 1940s, the agricultural sector was the largest component of GDP and the main source of Turkish exports. The Turkish economic administration gave priority to the transformation of the agricultural sector and export of agricultural products, and construction of roads to carry the agricultural products to the ports. In addition, external debt financing was transferred to the investment of some state-owned factories (Yavuz, 2009).

In the 1950s foreign debts, borrowed primarily from the U.S., the International Monetary Fund (IMF), and the World Bank, were used to financing investments in infrastructure, including energy and irrigation; meeting national defense needs; closing foreign trade gaps; and the financing of existing debts (Dönek, 1995).

Between 1960-1970, the necessity of external credit continued to increase because of Turkey's transition to a planned development approach which made use of 5-year development plans. In 1961, a loan was obtained from the IMF through the 1st Stand-by Arrangement (SBA)[3]. Turkey has since signed a stand-by arrangement with the IMF annually from 1961 to 1970 (Olcar, 2013).

From 1970-1980 several factors led to increasing external debt stock. Such factors included the need for the financing of public deficits, the devaluation in 1970 and the rise in oil prices

[3] A stand-by Arrangement is a funding arrangement in which the IMF agrees to provide credit to its member countries.

following the first oil crisis in 1973. Turkey was also affected by the economic recession that emerged after the second oil crisis at the end of the 1970s. During this period, investment and GDP growth were adversely affected due to the high external debt stock. In turn these low investment and growth rates caused a decrease in Turkey's repayment capacity and caused the country to enter a debt spiral (Karagöl, 2010).

The 1980s marked an important milestone for the Turkish economy with the abandonment of import-substitution growth policies and the adoption of outward-oriented growth strategies. In 1980, the structure of the economy was changed entirely with the January 24th economic decisions. Significant steps were taken to institutionalize the market economy. For example, policies to reduce the state's share in the economy were implemented, obstacles to foreign trade were lifted, and capital movements were gradually liberalized (Tokgöz, 2001). However, these changes led to rapid and uncontrolled outsourcing and further increased Turkey's external debt stock. A balance of payment deficits and budget deficits were the main factors driving the need for external borrowing in the 1980s. External borrowing and capital inflows become important sources of financing current needs. The rate of total external debt stock in GNP rose to 40% at the end of the 1980s, up from 20% at the end of 1970s (Karagöl, 2010).

The 1990s are considered to be quite a troubled period for the Turkish economy. This decade was characterized by high inflation, budget deficits, foreign trade deficits, high domestic and external borrowing, and short-term financing. During this decade, the Turkish economy became very fragile due to several internal and external factors, including: the economic situation that emerged after the 1994 economic crisis, postponed reforms, the coalition governments, the economic crisis experienced in the Asian economies in 1998 (especially that experienced by Russia). In addition, the 1991 Gulf War and the 1999 Marmara Earthquake caused economic problems to worsen. Large public expenditure, especially in the early 1990s, determined the path of the Turkish economy in this period. This public spending brought about instability, which led to further budgetary problems as public revenues failed to meet rising public expenditures. Turkey attempted to finance budget deficits by external borrowing and short-term capital movements, but this led to pressure on foreign exchange rates. These policies were unsustainable and caused the government to make some decisions in April 1994 to improve the economic situation. Within the framework of these decisions, the government established some financial regulations such as salary limitations and superannuation for officers, and privatization of some state-owned enterprises. In addition, it was envisaged that the exchange rate policy be used as a nominal anchor to rein in inflation. As a result, the Turkish Lira devalued approximately 38%. Turkey did not sign any stand-by arrangements between 1984 and 1993, but one was signed with the IMF in 1994 with IMF (Erkan et al., 2012).

By the end of the 1990's Turkey's economy was in a difficult position. As of 1999, economic growth was -6.1%, the annual inflation rate (CPI) was 68.8%, the primary balance of budget to GDP ratio had negatively grown[4], and the average interest rates of Treasury bonds reached to 110% (Celasun, 2002). In an effort to improve this economic situation, in 1999 a 3-year stand-by arrangement was signed with the IMF to reduce inflation and pass structural reforms with the intent to improve the economic situation. The most important feature of this program, "The Inflation Reduction Program," was to use the exchange rate as a nominal anchor in the monetary and exchange rate policies. The impact of this program became apparent in 2000 during which time capital inflows increased. The decline in inflation, however, was not as fast as expected. The real exchange rate appreciated and, as a result of a rapid increase in imports, the trade deficit began

[4] Primary balance to GDP ratio was 2.1% in 1998, that ratio, however, was -1.9% in 1999.

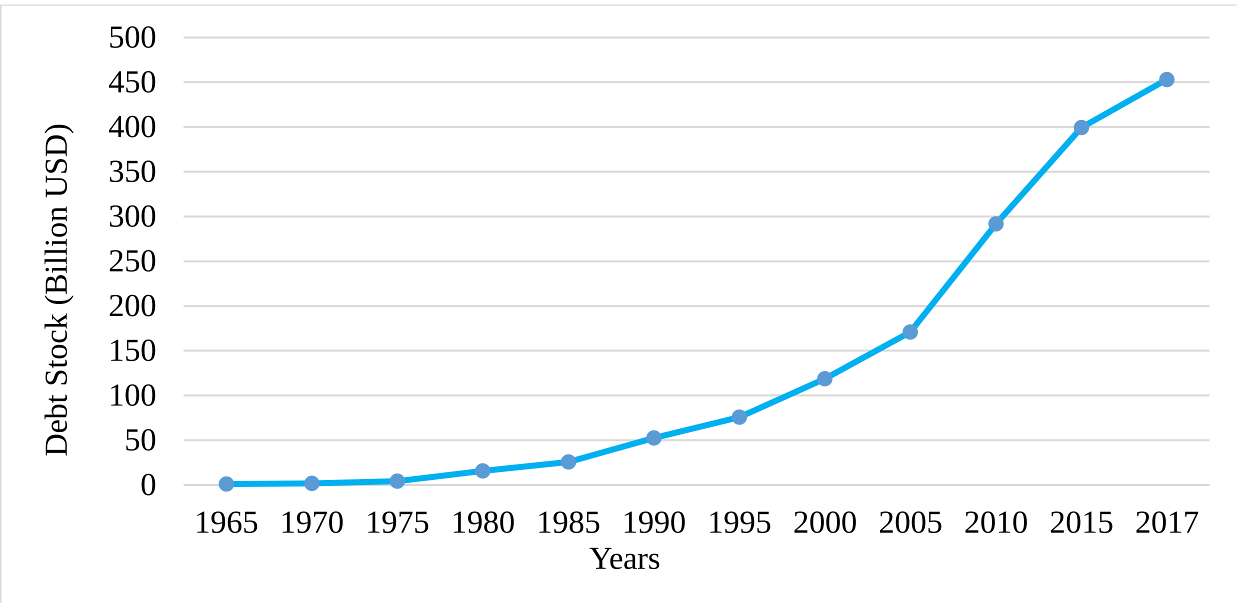
to grow substantially. These developments increased the demand for liquid assets from banks and liquidity shortage which culminated at the end of November 2000. This event, called the "Liquidity Crisis," led to an overnight increase in interest rate from 39% in October, to 95% in November, and eventually up to 183% in December 2000 (Uygur, 2001; Celasun, 2002).

As a result, expectations in the economy began to deteriorate. This started with a panic in the financial markets in February 2001 due to a political crisis in the top management of government resulting in an increase in foreign exchange demand (Celasun, 2002). Due to the inability to meet the liquidity needs of public banks, the fixed-exchange-rate policy was abandoned to prevent the systematic collapse in the banking sector. The Turkish Lira was devaluated by approximately 40% with this devaluation. After these twin crises in November 2000 and February 2001, the economy shrank 9%, the national income declined by $51 billion, 19 banks were closed, 1.5 million people became unemployed, and domestic debt stock became four-fold the level of the previous year (Karluk, 2005).

In response, the "Program for Transition to a Strong Economy", with support from the IMF and World Bank, was put into effect in May 2001. The program aimed to solve the following economic problems: unsustainable internal debt dynamics, unsound functioning of public banks and financial markets, and structural problems of the financial system. The structural reforms were implemented starting in 2002, with the end of coalition governments and the ensured political stability. Public sector fiscal discipline improved as a result of monetary policies which were compatible with fiscal policies. Inflation and interest rates began to decrease rapidly. On the other hand, important structural and legal reforms were realized in the financial sector specifically in the banking sector. With the improvement of the capital structure of banks, the Turkish banking sector became stronger against financial vulnerabilities. The 2000s marked a period of recovery for the all areas of the Turkish economy, leading to a period of economic stability (Rodrik, 2009; Uygur, 2001). This recovery and stable environment contributed to a period of economic growth that helped Turkey's external government debt to decrease rapidly.

1.2. The Current Situation of Turkish External Debts

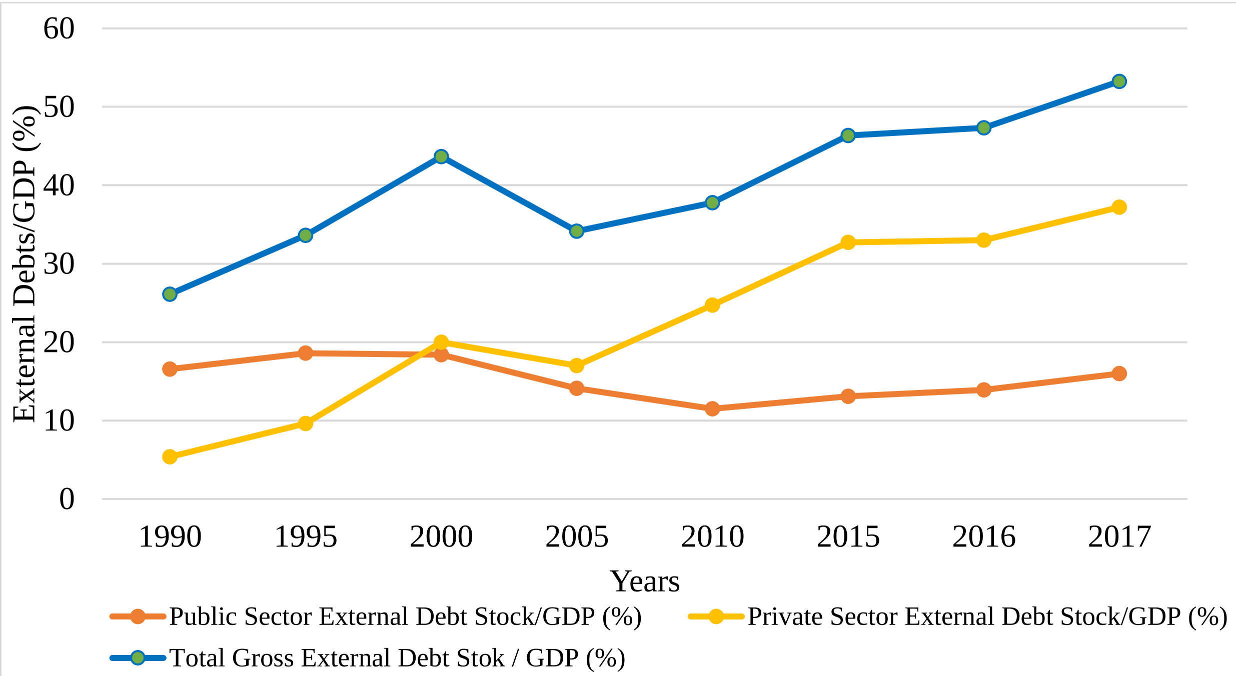
The brief history of the Turkish economy described thus far is useful for putting the current external debt into context. The current situation and historical course of Turkish external debt are discussed below.



Data Source: Turkish Treasury-External Debt Statistics of Turkey, 2018, Turkish Statistical Institution, 2018.

Figure 1: Gross External Debt Stock of Turkey, 1965-2017.

Figure 1 shows the progress of Turkey's gross external debt stock. As can be seen from this figure, Turkey's gross external debt stock has been continuously increasing. There are two main reasons for this increase. Firstly, the Turkish economy has begun to better integrate into world markets by eliminating its import-substitution growth policy since the 1980s. The removal of obstacles to international capital movements has increased the flows of funds, such as external debt, into the country. Secondly, the financial need of the public and private sector has been increased after trade liberalization in the 1980s. This can be better understood by examining the information presented in Figure 2, which shows the ratio of gross external debt stock to GDP.



Data Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.

Figure 2: Ratios of Total, Public, and Private External Debt Stocks to GDP, 1990-2017.

Separating external debt into short-term[5] and long-term debt helps to explain the indebtedness of a country. The short-term debt to total-term debt ratio may not be meaningful alone. The maturity structure of debt is a critical element in crisis prevention, particularly financial liquidity and solvency crises. Thus, considering this ratio in combination with other ratios such as leverage or short-term debt to foreign reserves, it is an indicator of vulnerability to temporary cut-off from financing (IMF, 2000).

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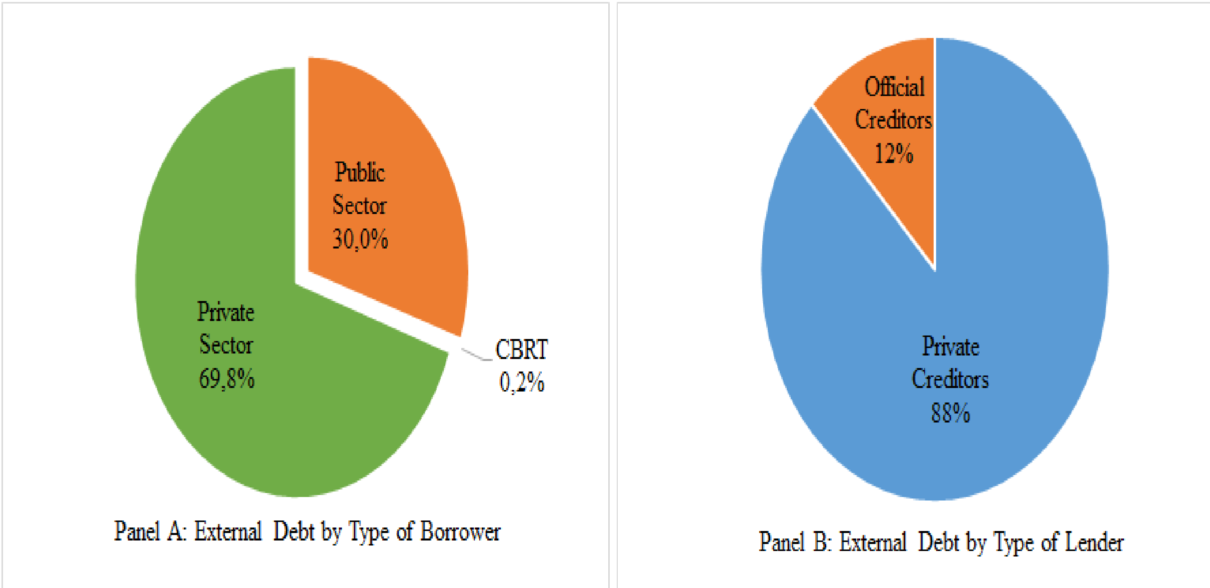
[5] Short-term external debt is external debt with a remaining maturity of one year or less (IMF, 2000).

Table 1: Total Gross External Debt Stock (Billion USD), 2010-2017

	2010	2011	2012	2013	2014	2015	2016	2017
TOTAL	291.7	305.3	341.9	392.4	405.0	399.5	409.3	455.1
Short Term	77.2	83.1	102.4	133.3	135.1	105.4	101.3	118.6
Long Term	214.5	222.2	239.5	259.1	269.9	294.1	308.0	336.5
Public Sector	89.1	95.8	106.3	118.9	121.3	116.6	123.4	136.6
Short Term	4.3	8.5	13.3	20.6	21.3	18.1	19.7	22.1
Long Term	84.8	87.3	93.0	98.3	99.8	98.5	103.7	114.5
Central Bank	11.6	9.3	7.1	5.2	2.5	1.3	0.8	0.7
Short Term	1.6	1.2	1.0	0.8	0.4	0.2	0.1	0.1
Long Term	10.0	8.1	6.1	4.4	2.1	1.1	0.7	0.6
Private Sector	191.0	200.1	228.6	268.2	281.3	281.5	285.1	317.9
Short Term	71.4	73.3	88.1	111.8	113.3	87.1	81.5	95.9
Long Term	119.6	126.8	140.5	156.4	168.0	194.4	203.6	222.0

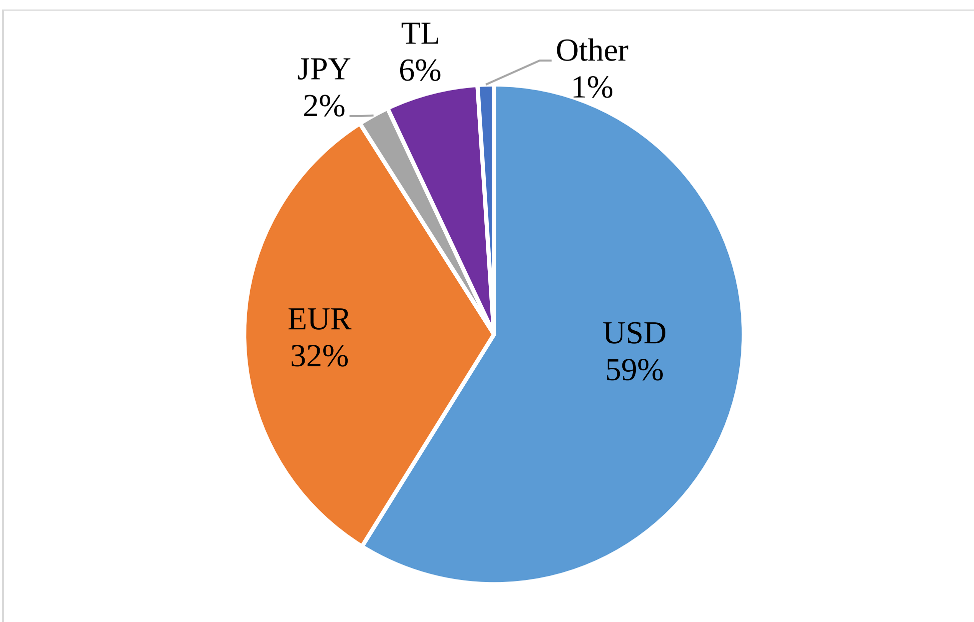
Source: Turkish Treasury-External Debt Statistics of Turkey, The Central Bank of the Republic of Turkey, 2018.

By combining information presented in Figure 2 and Table 1 it can be seen that in 2017, Turkey's total gross external debt stock was $455.1 billion, and the ratio of gross external debt stock to GDP was 53.3%. Total gross debt of $317.9 billion was borrowed by the private sector, $136.6 billion was borrowed by the public sector, and $666 million was borrowed by The Central Bank of Turkey. The 88% of $455.1 billion was borrowed from international private creditors, and the remainder was borrowed from international creditors such as government organizations and multilateral organizations.



Data Source: Turkish Treasury-External Debt Statistics of Turkey, The Central Bank of the Republic of Turkey, 2018.

Figure 3. Turkey's External Debt Stock by Types of Borrowers and Lenders, 2017.



Data Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.

Figure 4. Currency Composition of External Debts, 2017.

Figure 4 shows the currency distributions of the external debt of Turkey as of 2017. As can be seen in this Figure, Turkey's external debt is generally denoted in currencies such as USD and EUR. The debt stock held in Turkish Lira (TL) constitutes only 6% of the total. This is an indicator of the high level of vulnerability of Turkey to possible fluctuations in currency values.

1.2.1. The External Debt Stock of Private Sector

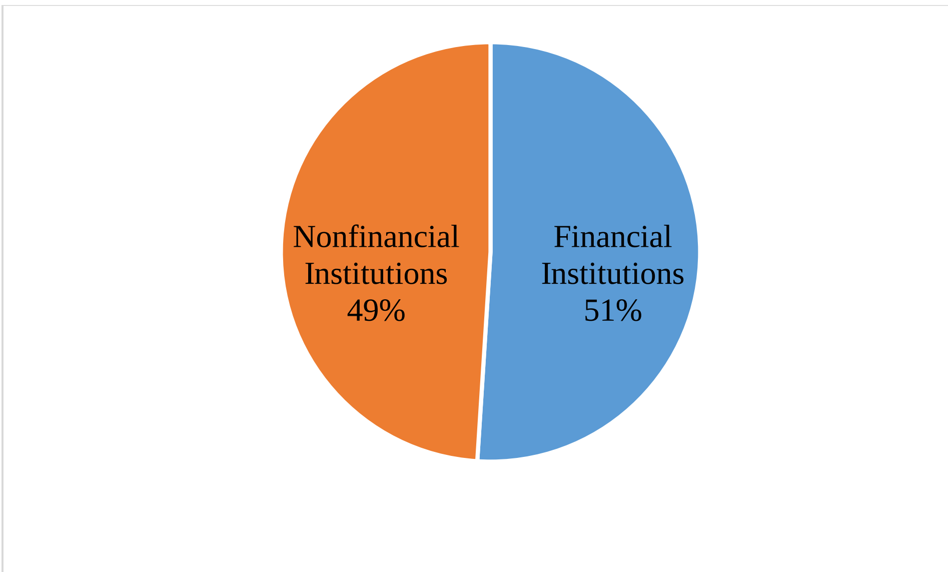
While private sector borrowing from foreign capital markets was limited, all obstacles to this source of financing were removed with changes in legal regulations in the 1980s. The share of private sector external debt stock in total was about 17% in 1990, whereas today, this ratio is about 70%. Particularly, since 2000, there has been a significant increase in the external debt stock of the private sector.

After the Liquidity Crisis in February 2001, Turkey pursued a growth model based on hot money inflows from international markets which kept short-term interest rates high for the purpose of decreasing the inflation and making Turkey attractive for the carry trade[6]. Over time, however, the economic policies implemented after the crisis have contributed to economic stabilization and a decrease in interest rates and risk prime. These improvements have helped eliminate uncertainty in the economy. Thus, the real sector has completely focused on production and as a result, financial need in the economy has increased (Badurlar, 2009).

When these two circumstances are evaluated together, it can be seen that financial institutions and companies, especially exporter and importer firms have been able to borrow from external capital markets more easily since the 2000s.

[6] According to Bilson (2013), a carry trade is a strategy in which the trader invests in a high yielding instrument financed by borrowing in a low yielding instrument. Popular carry trades include investments in low grade bonds financed by borrowings in high grade bonds, investments in long maturity bonds financed by borrowings in short maturity bonds, and options strategies in which the investor is long theta (receiving time premium).

Approximately 30% of the $317.9 billion gross external debt of the private sector is composed of short-term loans (due date is shorter than 1 year) and 70% is composed of long-term loans (due date is longer than 1 year). This ratio is a significant factor for debt sustainability. In addition, as can be seen from Figure 5, external debt stocks of financial institutions and nonfinancial institutions are almost equal. Therefore, it appears that nonfinancial institutions such as corporations can borrow easily from international markets.



Data Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.

Figure 5. Distribution of Private Sector's External Debts, 2017.

When analyzing the external debt stock of the private sector, a key issue to consider is exchange rate risk (also known as FX risk, foreign exchange rate risk or currency risk). The private sector will be most adversely affected by the possible depreciation of the domestic currency with a high foreign currency liability (Levi, 2005). In particular, nonfinancial companies whose operations use TL and whose their debts are denominated in foreign currency, bear a significant exchange rate risk in the case of potential devaluation in TL.

The risks borne by the financial sector, particularly the banking sector, are easily assessed with recently developed information systems and new measurement methods. The capital adequacy ratio is one of the most important indicators in this area (Dhumale, 2000). As of the end of 2017, the capital adequacy ratio[7] of the banking sector is 16.87%, well above the lowest legal limit of 8% as defined by the Basel II regulations (BDDK, 2019). In terms of the banking system, Turkey has seamlessly managed to adopt the Basel I regulations[8] which have been gradually implemented since 1989, and the Basel II regulations which were fully implemented by June 2012 after a long preparation phase. From existing information, it is expected that the Turkish banking sector will not have any challenges in complying with the Basel III regulations, which started to be discussed after the global crisis of 2008 and were settled in 2010. The expected high level of compliance with the regulations introduced by the Basel III Framework is based on the lessons learned from the banking crisis experienced in 2001 and the subsequent discipline and reorganization of the banking system (Yıldırım, 2015).

Within Turkey's private sector external debt stock of $317.9 billion, 49% was used by nonfinancial institutions. Companies in the real sector, which have a relatively low capacity to generate foreign currency assets, usually take advantage of hedging against possible exchange rate risks through the intensive use of hedging instruments in derivative markets. However, this sector is particularly vulnerable in the case of increases in exchange rates. The Turkish Economic Administration, which is aware of this fact, has been working in detail the dynamics of borrowing with foreign currency and the protection mechanisms against foreign exchange risk of the real

[7] Capital adequacy ratios are a measure of the amount of a bank's capital expressed as a percentage of its risk weighted credit exposures (Reserve Bank of New Zealand, 2007).
[8] The Basel Accords refer to the banking supervision Accords (recommendations on banking regulations)—Basel I, Basel II and Basel III—issued by the Basel Committee on Banking Supervision (BCBS). The Basel Accords is a set of recommendations for regulations in the banking industry.

sector. A comprehensive structural transformation program was launched in 2017 for the purpose of better management of the real sector's exchange risk. The first step toward this was initiated in January 25, 2018. Along with the legal arrangement, an effective link was established between the foreign exchange income and the credit usage where the outstanding balance of foreign exchange credit of firms has been limited to the sum of the foreign exchange income of the last 3 fiscal years for those firms (Legal Gazette, 2018).

1.2.2. The External Debt Stock of Public Sector

The IMF is one of the most important institutions providing external debt financing to Turkey. Turkey has received a significant amount of credit from the IMF of any country, second only to Brazil (IMF, 2019). Starting in 1961, 19th Stand-by Arrangements have been signed between Turkey and the IMF, most of which were reached during circumstances of significant economic and financial turmoil. All of the credits provided by the IMF were administered through stand-by arrangements. The credits were issued according to revisions after submitting a Letter of Intent brought with revision and supervision of IMF. Table 2 shows the credit relationship between the IMF and Turkey. The total amount of credit Turkey has received from the IMF is about 30.5 billion SDR[9]. Currently, Turkey has no debt owed to the IMF; the last installment of credit provided by the 19th Stand-by Arrangement was repaid in 2013.

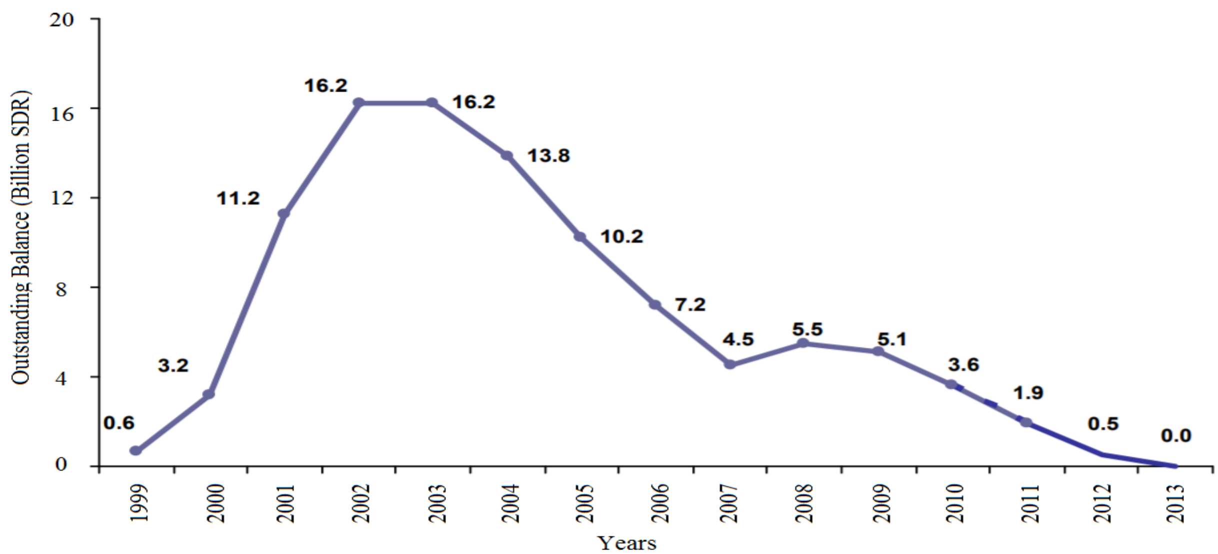
[9] Special Drawing Right (SDR) is an international reserve asset, created by the IMF in 1969 to supplement its member countries' official reserves. The value of the SDR is based on a basket of five currencies—the U.S. dollar, the euro, the Chinese renminbi, the Japanese yen, and the British pound sterling (www.imf.org). As of March 15, 2019, this amount is equal to $42.6 billion.

Table 2: History of Turkey's Lending Arrangements with the IMF (1,000 SDR), 2017

	Facility	Arrangement Date	Amount Agreed	Amount Drawn
1	SBA	Jan 01, 1961	37,500.00	16,000.00
2	SBA	Mar 30, 1962	31,000.00	15,000.00
3	SBA	Feb 15, 1963	21,500.00	21,500.00
4	SBA	Feb 15, 1964	21,500.00	19,000.00
5	SBA	Feb 01, 1965	21,500.00	0.0
6	SBA	Feb 01, 1966	21,500.00	21,500.00
7	SBA	Feb 15, 1967	27,000.00	27,000.00
8	SBA	Apr 01, 1968	27,000.00	27,000.00
9	SBA	Jul 01, 1969	27,000.00	10,000.00
10	SBA	Aug 17, 1970	90,000.00	90,000.00
11	SBA	Apr 24, 1978	300,000.00	90,000.00
12	SBA	Jul 19, 1979	250,000.00	230,000.00
13	SBA	Jun 18, 1980	1,250,000.00	1,250,000.00
14	SBA	Jun 24, 1983	225,000.00	56,250.00
15	SBA	Apr 04, 1984	225,000.00	168,750.00
16	SBA	Jul 08, 1994	610,500.00	460,500.00
17	SBA	Dec 22, 1999	15,038,400.00	11,738,960.00
18	SBA	Feb 04, 2002	12,821.200.00	11,914,000.00
19	SBA	May 11, 2005	6,662,040.00	4,413,602.00
TOTAL			37,707,640.00	30,569,062.00

Notes: SBA=Stand-by Arrangement, SDR=Special Drawing Right.
Source: IMF, 2018.

When IMF credits are taken into consideration, the total cost of the "Inflation Reduction Program" put forth to overcome the economic problems faced until 2000, and the "Transition to the Strong Economy Program" intended to address the financial and economic crises in November 2000 and February 2001 was about 28 billion SDR. As of 2017, the present value of this amount was approximately $40.9 billion (Sevig, 2017).



Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.

Figure 6. Credit Outstanding to IMF, 2018.

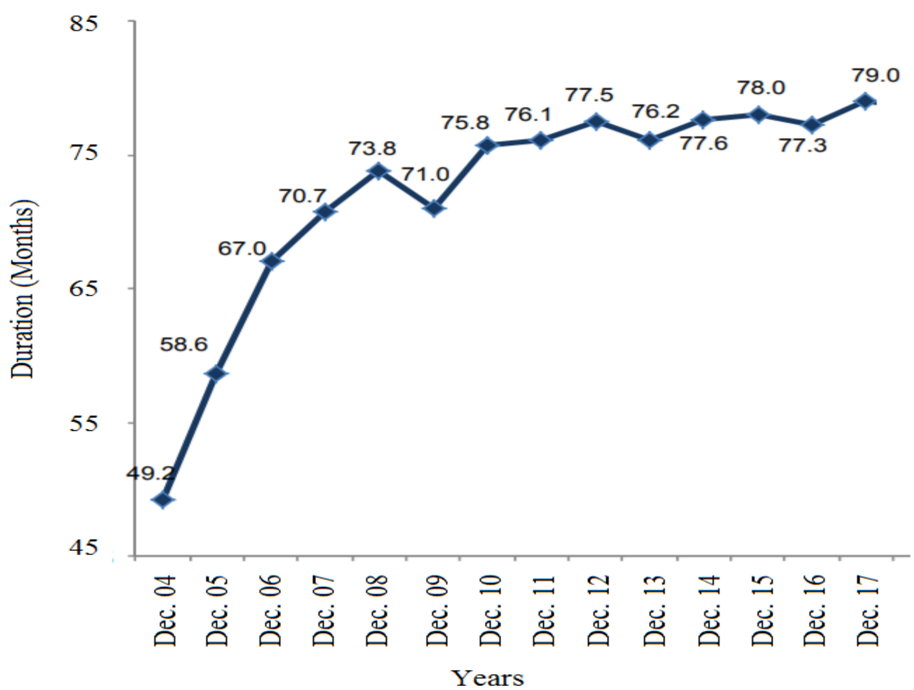
Figure 6 shows the outstanding balance of external debts provided by the IMF. In examining this diagram, it can be seen that the outstanding balance culminated after the financial crises in November 2000 and February 2001. All IMF credits were repaid in a ten-year period (2003-2013).

Table 3: The Distribution of Public Sector's External Debt Stock (million USD), 2017

	Short-Run	Long-Run	Total Amount	Percent (%)
General Government	-	93.477	93,477	68.5
Central Government	-	90.241	90,241	
Local Administrations	-	3.236	3,236	
Financial Institutions	22.027	19.584	41,611	30.5
Banks	22.027	19.584	41,611	
Non-Financial Institutions	84	1.386	1,470	1
SOE's	84	1.386	1,470	
TOTAL	22.111	114.446	136,557	100
Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.				

As presented in Table 3, as of the end of 2017 the total gross external debt stock of the public sector was about $136.5 billion, of which 16.2% consisted of short-term and 83.8% consisted of long-term debt. About 68.5% of the external debt stock of the public sector consists of loans used by the general administration and 30.5% by state banks. The remaining 1% of this debt is held by State Owned Enterprises (SOE's).

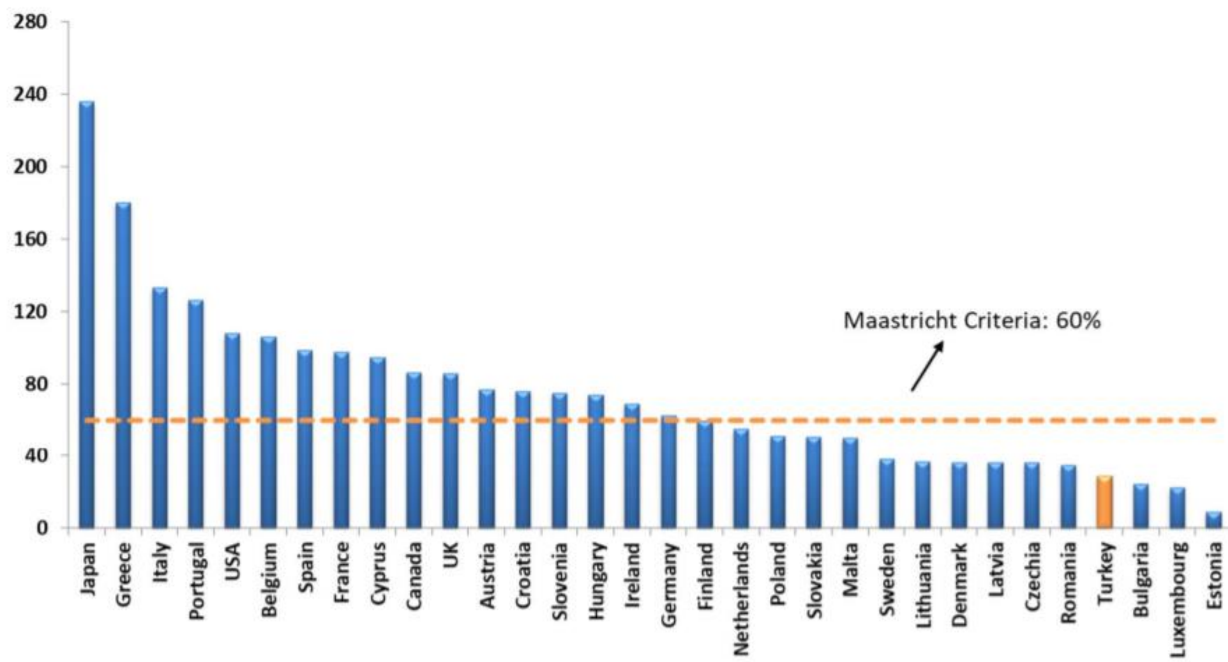
The ratio of public sector's foreign debt stock to GDP was 16.6% in 1990, 18.4% in 2000 and 16% in 2017. On the other hand, the share of external debt stock in the total foreign debt stock, which the public sector used, was 64% in 1990, 42% in 2000, and 30% in 2017.



Source: Turkish Treasury-External Debt Statistics of Turkey, 2018.

Figure 7. Duration of External Bond Stock (Macaulay Duration), 2004-2017.

The maturity structure of debt is an important point in crisis prevention, and it has a profound impact on liquidity. For example, short-term debt by original maturity will be repaid or rolled over in current year, however, for long-term loans, borrower has at least more than a year for repayment. While the maturity structure is important, it is difficult to capture this a single number such as average maturity of overall debt that is useful. Therefore, this point should be also tracked using other ratios such as reserves to short-term debt (IMF, 2000). As shown in Figure 7, the maturity of the public sector's foreign debts has also become more prolonged over time. This significantly contributes to the sustainability of external debts for the public sector.



Source: Eurostat (updated: July 20, 2018, Turkish Treasury (As of June. 29, 2018).
For USA, Japan, Canada: IMF World Economic Outlook (July 2018).

Figure 8. General Government Gross Debt (% of GDP, 2017).

Importantly, however, as can be seen in Figure 8, the ratio of total gross debt stock (the total of external and domestic debt stock) to GDP is relatively low when compared to developed and European Union countries. It is also well below the 60% which is the Maastricht Criteria[10].

[10] The euro convergence criteria (also known as the **Maastricht criteria**) are the criteria which European Union member states are required to meet to enter the third stage of the Economic and Monetary Union (EMU) and adopt the euro as their currency. The four main criteria, which actually comprise five criteria as the "fiscal criterion" consists

1.3. Analysis of Turkey's External Debts

Today, almost all countries are in debt, the exception being a few small countries. At this point, it is recognized that the sustainability of debt is perhaps as important as the amount of debt. The sustainability of debt for a country is closely connected with its current account balance and international reserve. If there is a current account surplus in an economy, this surplus ensures the easy payment of external debts. However, if a surplus is not available in the current account, the financing of this deficit and external debt must be serviced through either accumulated reserves or refunding (Yeldan, 2005). Similarly, the relationship between foreign reserves and external debt affects a country's external vulnerability through their impact on the country's ability to discharge external obligations. The inability to discharge obligations may result either from a solvency or a liquidity problem (IMF, 2000). According to the IMF (2003):

> *"However, various factors need to be taken into account when interpreting the ratio of international reserves to short-term debt. First, a large stock of short-term debt relative to international reserves does not necessarily lead to a crisis. Many advanced economies have higher ratios of short-term debt to reserves than many emerging economies, which have shown vulnerability to financial crisis. Factors such as an incentive structure that is conducive to sound risk management, and a proven track record of contract enforcement, can help develop credibility, and help to explain this difference. Moreover, macroeconomic fundamentals, in particular the current account deficit and the real exchange rate, play an important role. Consideration should also be given to the exchange rate regime. For example, a flexible regime can reduce the likelihood and costs of a crisis. Finally, the ratio assumes that measured international reserves are indeed available and can be used to meet external obligations; this has not always been true historically (p.176)."*

The Turkish economy has had persistent current account deficits since the 2000s. The amount of the deficit was $33 billion in 2016 and $47 billion in 2017. As of 2017, the ratio of the

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of both a "debt criterion" and a "deficit criterion", are based on Article 140 of the Treaty on the Functioning of the European Union.

current account deficit to GDP was 5.5%, and the Central Bank reserves were $107.7 billion by the end of 2017. The short-term external debts to foreign reserves ratio have deteriorated in recent years from 111% in 2010 to 105% in 2016 and 91% in 2017.

If countries have high external debt amounts, the problem of balance of payments becomes more serious. The concentration of debt in the short-term increases the external fragility of the country and makes the country more vulnerable to external shocks (Kaminsky, 1999). The ratio of short-term debts to foreign exchange reserves is accepted as an important indicator in the measurement of this fragility (IMF, 2000). First this ratio gives information about the liquidity of the country, which, in turn, offers insight into the fiscal vulnerability of the country. Secondly, the size of the short-term debt to foreign exchange reserves ratio is also an important macroeconomic indicator; larger values this ratio reflect an increase in the possibility to need to finance the long-term debt with short-term financing instruments. This possibility is a serious problem that may not escape foreign investors' notice. Third, short-term debt creates significant risk and vulnerability for a country due to the possibility that creditors may withdraw money at any time. Finally, larger values of this ratio provide the market negative signals about the quality of financing used to support the balance of payments (Furman and Stiglitz, 1998).

Rodrik and Velasco (1999) also found that potential liquidity problems caused by a high proportion of short-term debt to reserves could lead to a significant vulnerability for developing countries. Short-term debt does not just become a trigger for an economic crisis but once the crisis exists, the magnitude of short-term debt also has an impact on the deepening of the crisis.

In the light of these explanations, some specific analytical and financial criteria are required to determine the debt status of a country. Financial ratios accepted by the World Bank and the IMF can be used to characterize how much a country is in debt.

Ratio of total external debt stock to GDP. According to Villanueva and Mariano (2007), a continuous increase in the external debt to GDP ratio will, sooner or later, lead to liquidity and solvency problems. Roubini (2001) argues that a non-increasing foreign debt to GDP ratio is seen as a practical sufficient condition for sustainability - a country is likely to remain solvent as long as the ratio is not growing. For the Turkish economy, Table 4 shows that while this ratio was 38% in 2010, it had reached 53% by 2017.

Ratio of total external debt stock to exports. Table 4 shows that while this ratio was 256% in 2010, it had reached 285% by 2017.

Ratio of Foreign Debt Service to Exports, Ratio of External Debt Interest Services to Export: The IMF and World Bank use Ratio of Foreign Debt Service to Exports for analysis of debt sustainability. While this ratio for Turkey was 39.7% in 2010, it reached 43.3% by 2017.

The ratio of external debt interest services to export is also used to examine this. As depicted in Table 4, this ratio for the Turkish economy was 7.3% in 2010 and 7.5% in 2017.

As mentioned above, reserves to short-term external debts ratio is a significant indicator for external vulnerabilities. Countries may benefit from holding foreign reserves sufficient to cover all short-term debt obligations. Thus, reserves should be at least equal to short-term external debt. This benchmark, known as Greenspan-Guidotti rule, is a preferred benchmark for measuring vulnerability to capital account crisis (Jeanne and Ranciére, 2006). As shown in Table 4 this ratio has deteriorated since 2010.

According to the IMF (2002), it is unlikely that any definitive “danger levels” in the values of these ratios can be established. The IMF, however, suggests that an external debt to GDP ratio of about 40 percent for developing countries and 60 percent for developed countries provides a useful benchmark.

No single indicator is likely to fully capture the likelihood that a country's debt will prove unsustainable. In the context of external debt, a country must generate trade surpluses to service its debt. Taking as given the degree of possible import compression, this implies that, among other factors, the export/GDP ratio (or debt export or debt service/export) ratio will be relevant as well. For example, the external debt to GDP ratio should be below 60 of GDP when export ratio below 20 percent; the export ratio between 20 and 40 percent of GDP, the corresponding debt-GDP ratio should be 60-80 percent. Likewise, when the debt service-to-export ratio is low, the debt-GDP ratio can be higher. As expected, the estimated debt threshold increases with higher export ratios (IMF, 2002).

Another important point is the currency composition of external debt. Information on the currency composition of the gross external debt position is necessary for monitoring an economy's potential vulnerability to exchange rate risks. In the event of a sudden depreciation of the domestic currency, foreign currency external debt has potentially important wealth and cash-flow effects for the economy (IMF, 2014). Only 6 percent of the total external debts stock was denominated in the domestic currency in 2017.

In addition to these ratios, Table 4 shows other useful indicators for the sustainability of external debts. Similarly, most of the other ratios have deteriorated since 2010.

Table 4: Important Ratios Related External Debts (%)

Ratio	Purpose of Ratio (IMF, 2000)	Outcome for Turkey	
		2010	2017
Total External Debt over GDP	Useful indicator relating debt to resource base (for the potential of shifting production to exports so as to enhance repayment capacity).	38%	53%
Private Sector External Debt over GDP	Useful indicator relating debt to resource base (for the potential of shifting production to exports so as to enhance repayment capacity).	25%	37%
Export to GDP	Useful indicator of whether having a transfer problem or not.	15.7%	19.5%
Total External Debt over Exports	Useful indicator of trend in debt that is closely related to the repayment capacity of the country.	256%	285%
Private Sector External Debt over Exports	Useful indicator of trend in debt that is closely related to the repayment capacity of the country.	168%	199%
External Debt Service over Exports (FOB)	Useful indicator of willingness to pay and transfer risk.	39.7%	43.3%
External Debt Interest Service Ratio/Export (FOB)	Useful indicator of willingness to pay and transfer risk.	7.3%	7.5%
Total Short-Term Debt over Total-Term Debt	An indicator of vulnerability to temporary cut-off from financing.	26%	26%
Public Sector External Debt over Total Debt	Indicator of the impact of a change in the exchange rate on debt.	31%	30%
Ratio of Reserves to Short-Term External Debt	Single most important indicator of reserve adequacy in countries with significant but uncertain access to capital markets.	111%	91%
Share of Foreign Currency External Debt in Total External Debt	Useful indicator of the impact of exchange rate changes on debt (balance sheet effect), especially in conjunction with information on derivatives that transform the effective currency composition.	90.3%	94%
Average Maturity	Useful for homogeneous categories such as non-concessional public sector debt, to track shortening of maturities or efforts to limit future vulnerability.	75.6 (Month)	79 (Month)
Data Source: Turkish Treasury, The Central Bank of the Republic of Turkey, 2018.			

The World Bank and IMF use those ratios for their External Debt Sustainability Analysis (DSA)[11]. The IMF conducts DSA for many countries every year. According to the IMF's DSA results (IMF, 2018);

> *"Turkey's external debt, while sustainable, is high and vulnerable to valuation shocks. Under the baseline, debt is forecast to stabilize at around 52 percent of GDP in the medium term. However, it is susceptible to Lira depreciation and annual rollover needs of around 20 percent of GDP expose the economy to high liquidity risks (p.55)."*

We do not use the DSA in this paper, however, the mentioned ratios clearly show that the vulnerability of the Turkish economy in terms of external debt has increased. The most important cause of this has been the rapid increase in external debt stock of the private sector since 2000.

Arnone et al. (2005), however, claim that the DSA approach presents several shortcomings. Financial sustainability is a limited measure of a notion for a concept that is, instead, multi-faceted and requires a wider perspective. The most important shortcomings of the standard DSA are the endogeneity of the relevant variables, the exclusion of domestic debt and the essential needs requirements.

Furthermore, according to Roubini and Watchel (1998), some economic issues could be assumed as the indicator of debt sustainability; such as the sources of current account deficits, structure of current account deficits, size and structure of capital flows, foreign exchange reserves and debt burden, real exchange rate, fragility of the financial system and political stability and uncertainties in the economy. Similarly, Calderon, et al. (2001) have specified external debt sustainability indicators as domestic and external economic factors and developments in the world economy.

[11] The general framework of DSA is the equation of [r - g - r(1+g) + ea(1+r)]/(1+g+r+gr), with r = nominal effective interest rate on external debt; r = change in domestic GDP deflator in US dollar terms, g = real GDP growth rate, e = nominal appreciation (increase in dollar value of domestic currency), and a = share of domestic-currency denominated debt in total external debt.

When aforementioned issues are considered together, it can be concluded that the public sector has been the net external debt payer and the private sector has been the net external debtor since 1990. It can be said that there is no problem with the sustainability of external debt for the public sector, but the private sector may be exposed to significant foreign exchange risk. In addition, comprehensive structural reform has been launched by the economic administration regarding the private sector foreign loans. This will avoid the firms not having sufficient foreign exchange resources to borrow more than they can pay. As a result, the exchange rate risk recovery of the private sector is expected in the long term. When this reform and the 30 percent share of private sector's short-term external debt are taken into consideration, the private sector's external debt is thought to be sustainable.

According to the Table-4, central bank reserves, which are mostly liquid, have declined since 2010. However, as of 2017 these are not sufficient to cover short-term external debts. The current account deficit has also widened sharply to 5.5 percent of GDP in 2017. Turkey's cumulative external debt, at around 50 percent of GDP, is sustainable, but has increased rapidly, and is sensitive to exchange rate valuation risks. Given that over 90 percent of the external debt is denominated in foreign currency, the sensitivity can be easily understood. According to IMF (2018), a permanent TL depreciation of 30 percent would push the external debt stock to 83 percent of GDP by 2023, including about 60 percent of GDP of private debt. Thus, we emphasize that external debt is one of the most important vulnerabilities of the Turkish economy. Results may help to draw the attention of policymakers to the fact that the external debt burden of the private sector has been rapidly increasing.

In addition to the ratio analysis, sustainability of external debts of Turkey can be reviewed again by implementing an empirical model or World Bank/IMF DSA. In the literature, there are some causality approaches for the measuring of sustainability of external debts in Turkey. For an early warning to possible financial liquidity or solvency crises caused by external debt, external debts should be examined in detail with an econometric model in points of their maturities, types, usage areas, currencies, interest structures, lenders. To do this, vector autoregression (VAR) or Geometry Debt Sustainability (GDS) approaches can be used.

CHAPTER 2

DOES EXTERNAL DEBT CONTRIBUTE TO ECONOMIC GROWTH IN TURKEY?

2.1. Importance of External Debts

In various theoretical models, “reasonable” levels of current debt inflows are likely to enhance a country’s economic growth both through capital accumulation and productivity growth if the borrowed money is utilized effectively such as for productive investment purposes. According to the traditional neoclassical models, allowing for capital mobility, or the ability of a country to borrow and lend in the international capital markets increases transitional growth. Borrowing and investing can stimulate the economies of capital-scarce countries since the marginal product of capital is above the world interest rate. Furthermore, some endogenous growth models show that an increase in the cost of foreign capital that lowers external borrowing leads to lower long-run economic growth, an example of this is found in Eaton (1993). Pattillo et al. (2002) found empirical support of a relationship of external debt on economic growth; at low levels, debt has positive effects on growth, but above particular thresholds or turning points, additional debts begin to have a negative impact on growth.

Conversely, a large amount of debt may cause a negative effect on economic growth. This irony is explained by debt overhang theories. Krugman (1998) argues that if the accumulated debt amount crosses the threshold level of a country’s debt repayment ability, then expected debt service will be an increasing function of the country’s output level. The returns from investing in the country, therefore, face a high marginal tax by the external creditors, and new domestic foreign investment is discouraged. Thus, potential investors will be less willing to incur investment costs for the sake of increased output in the future. According to Pattillo, et al. (2004):

> *“This argument is represented in the “debt Laffer curve”, which posits that larger debt stocks tend to be associated with lower probabilities of debt*

> *repayment. On the upward-sloping or "good" section of the curve, increases in the face value of debt are associated with increases in expected debt repayment, while increases in debt reduce expected debt repayment on the downward-sloping or "bad" section of the curve. The expectation that some portion of the debt will have to be forgiven can also at some point discourage private foreign investors from providing new financing, thus lowering capital accumulation (p.5-6)."*

In addition, Calvo (1998) found that high debt leads to a lower rate of return on capital, lower investment, and growth.

In the Solow-Swan (1956) model, effective labor and capital stock are two important determinants of economic growth. By assumption of constant returns to scale, the growth of output per capita is determined solely by the rate of technological progress. Mankiw et al. (1992) extend the Solow-Swan model to include human capital where human capital investment is in the form of education. This study concludes that adding human capital to the Solow model improves its performance. Romer (1986) and Lucas (1988) have also highlighted the rate of human capital accumulation as a source of economic growth. In addition, some economists including Otani and Villanueva (1989) and Villanueva and Mariano (2007) have further extended the Solow-Swan model for the open economy after the free trade and capital movements.

2.2. Data and Methodology

Otani and Villanueva (1989) and Villanueva and Mariano (2007) analyzed the relationship between external debt and economic growth. These studies were inspired by the Solow-Swan growth model and examine the role of external debt in contributing to GDP growth. In these studies, aggregate capital stock is defined as the sum of domestic saving and net external debt. Current account deficit, consumption, net factor payment, external borrowing function, and effective labor are included as independent variables in their both models.

Robert Barro (1996) attempted to find the determinants of economic growth. In the study, the initial level of GDP, the initial level of human capital, investment, government consumption, terms of trade are chosen as control variables.

Pattillio et al. (2002, 2004) use panel data to explore the relationship between external debt and economic growth. They chose initial GDP, human capital, fiscal balance, trade openness, investment and debt indicators to find channel effect as independent variables in their models. One of the important aims of these papers was to identify particular thresholds or turning points for determining which level is low or high indebtedness, so some of the variables are used for this goal.

On the basis of this literature, the following model is used to explain whether the external debt has affected economic growth in Turkey:

$$GDP_t = \beta_0 + \beta_1 GDP_{t-1} + \beta_2 ExtD_t + \beta_3 Inv_t + \beta_4 Tax_t + \beta_5 Tert_t + \beta_6 Open_t + \varepsilon_t \qquad (1).$$

where GDP_t is Gross Domestic Product (GDP) at time t, GDP_{t-1} is GDP from the previous period t, $ExtD_t$ is gross external debt stock (sum of public and private sector debt) at time t, Inv_t is gross investment at time t, Tax_t is government tax revenue at time t, $Tert_t$ is number of people enrolled in tertiary education at time t, and $Open_t$ is a measure of trade openness at time t. Investment and tertiary education (highly educated population) represent factor inputs as in the Solow-Swan model, while trade openness and external debt account for government policies particularly on trade and external debt management policy.

Table 5 presents description of all data used in this analysis. While government tax revenue data are provided from OECD, all the other data were obtained from the World Bank DataBank

Service for 1970 to 2016 (The Database of World Development Indicators and Education Statistics). Annual values of each of the variables are used, and all are log transformed except for trade openness which performed through time series method.

Table 5: Data Description and Source

Variable	Data Name	Source
GDP	GDP at purchaser's price in current USD	WB (World Development Indicators)
ExtD	External debt stocks, total (DOD, current US$)	WB (World Development Indicators)
Inv	Gross fixed capital formation (current US$)	WB (World Development Indicators)
Tax	Total tax revenue as % of GDP	OECD (Revenue Statistics)
Tert	Enrolment in tertiary education, all programs, both sexes (number)	WB (Education Statistics)
Open	Trade (% of GDP, trade is the sum of exports and imports of goods and services measured as a share of gross domestic product.)	WB (World Development Indicators)
Notes: WB = World Bank OECD = The Organization for Economic Co-operation and Development DOD = Debt Outstanding Disbursed		

In the literature, some tests such as Engle-Granger and Johansen are often used for cointegration representing a stationary composition of at least two non-stationary time series. In these cointegration tests, there is an assumption that the series analyzing cointegration should have the same stationarity level. This prerequisite is eliminated by the Autoregressive Distributed Lag (ARDL) bound test developed by Pesaran et al. (2001). Basically, the ARDL bound test is the Wald test (F-statistic version of the bound testing approaches) for the lagged level variables in the right-hand side of an unrestricted error correction model. Unlike, the Engle-Granger and Johansen approaches, ARDL can be applied to a model, irrespective of whether the explanatory variables are purely I(0) or I(1). Therefore, it is not necessary to determine the stationarity of the variables before applying the bound test. The control variables, however, need to be tested against the possibility of I(2), since their critical values are classified by I(0) or I(1). Another advantage of the ARDL approach is that this method is feasible for small sample sizes (Pesaran et al. 2001; Nkoro and Uko, 2016).

In the ARDL approach, after stationarity tests, the fact that whether a model has a cointegration or not should be also tested. To do this, the ARDL bound test is used. If the F-statistic falls outside the critical bounds (lower and upper values), a conclusive inference can be made. The null hypothesis of the ARDL bound test is that there is no cointegration. If the F-statistic is greater than the upper bounds value, the null hypothesis of no cointegration must be rejected. If the F-statistic is smaller than the lower bounds value, then the null of non-cointegration cannot be rejected. If the F-statistic is between the upper and lower bounds, we cannot make a conclusive inference (Pesaran et al. 2001).

The second stage of the ARDL approach is to estimate the coefficients of the long-run cointegrating relationship and the corresponding error correction model. The generalized ARDL (p,q)[12] model is specified as:

$$Y_t = \alpha_{0i} + \sum_{i=1}^{p} \delta_{i=1} Y_{t-i} + \sum_{i=0}^{q} \beta'_i X_{t-i} + \lambda ECT_{t-1} + \varepsilon_t \qquad (2)$$

Where (Y_t) is a vector and the variables in (X'_t) are allowed to be purely *I(0)* or *I(1)* or cointegrated; δ, β and λ are coefficients: α is the constant; $i=1,2,\ldots,k$; p and q are optimal lag orders; ε_t is a vector of error terms (Peseran et al., 2001).

The dependent variable Y_t is the function of, its lagged values, the current and lagged values of other exogenous variables in the model. In the cointegration analysis, the lagged error correction

[12] The number of lags is denoted by *p* and *q; p* is used for the dependent variable; *q* lags are used for the independent variables.

term ECT_{t-1} derived from the error correction model is an important element, as it allows for adjustment back to the long-term equilibrium relationship (Peseran et al., 2001).

According to Peseran et al. (2001), the ARDL boundary test is sensitive to the lag length. Thus, it is first necessary to decide the *p* and *q* value indicating the lag length of the differentiated variables. For this purpose, information criteria such as Akaike (AIC), Bayesian (BIC), Schwarz (SIC) and Hannan-Quinn (HQIC) are used.

2.3. Empirical Findings

Before performing the analysis of cointegration, a stationary test for each variables should be conducted. To do this, the Augmented Dickey–Fuller (ADF) test was chosen and the results show that all variables are purely first order I(1). Then, we can analyze whether the model has cointegration. When using an ARDL approach, the Pesaran/Shin/Smith (2001) ARDL Bounds Test is applied for the analysis of cointegration. The ARDL Bounds Test results are following:

Table 6: Results of ARDL Bounds Test of Cointegration

	1%		5%		10%	
	I (0)	I(1)	I (0)	I(1)	I (0)	I(1)
Critical Value	3.41	4.68	2.62	3.79	2.26	3.35
Notes: F-statistic = 6.176 H0: no levels relationship Accept if F < critical value for I(0) - Lower Bound regressors, Reject if F > critical value for I(1) - Upper Bound regressors						

According to the bound tests results, we must reject the null hypothesis which states there is no relationship at 1%, 5% and 10% levels since the F-statistic (6.176) is higher than upper bounds. In other words, we conclude that there is a cointegration. To verify this result, as all explanatory variables are purely I(0) or I(1) order of integration, the Johansen test for testing for cointegration of time series data, was also performed. In our model, our variables are purely I(1), so the Johansen test is an appropriate test; The following table shows the results of the Johansen test. These results indicate that the model has cointegration and its rank is 3. It has verified that the empirical model has cointegration at the 5% level.

Table 7: Results of Johansen Tests for Cointegration

Max rank	Parms	LL	Eigenvalue	Trace Statistic	5% Critical Value
0	114	366.725	-	169.6671	94.15
1	125	397.9016	0.77341	107.3139	68.52
2	134	425.15032	0.7268	52.8165	47.21
3	141	439.46804	0.49429	24.1810*	29.68
4	146	447.07986	0.30404	8.9574	15.41
5	149	450.26522	0.14074	2.5867	3.76
6	150	451.55855	0.05973		
*The model has at least 3 rank of cointegration level.					

After the testing, if the variables are cointegrated we can specify both short-run (ARDL) and long-run (Error Correction Model-ECM) models, otherwise, we can only specify the short-run model using the ARDL approach. Similarly, in the Johansen approach, if the variables are cointegrated we can specify both short-run (Vector Autoregressive-VAR) and long-run (Vector Error Correction Model-VECM) models, otherwise we can only specify the short-run model. Table 7 presents shows the results of ARDL, Johansen and OLS estimation results.

Table 8: Results of Estimated Long-Run Coefficients

Variable	GDP		
	ARDL (1,4,2,3,0,1)	Johansen	OLS
Constant		-32.084	0.0341 (0.0267)
Investment	0.528** (0.195)	3.571*** (.838)	0.464*** (0.0844)
Tax Revenue	0.921*** (0.175)	0.328 (0.963)	0.283** (0.115)
Tertiary Education	-0.375** (0.136)	-1.323** (0.641)	-0.103 (0.125)
Openness	0.675 (0.639)	15.436*** (2.637)	-1.023*** (0.229)
ECT_{t-1}	-0.435*** (0.111)	-0.063* (0.034)	
External Debt Stock	-0.346** (0.147)	-3.413*** (0.525)	-0.121 (0.0950)
External Debt Stock (Lag1)			0.0643 (0.0980)
External Debt Stock (Lag2)			0.107 (0.0911)
External Debt Stock (Lag3)			-0.0720 (0.107)
GDP (Lag1)			-0.0580 (0.0643)
Diagnostic Tests			
R-squared	0.956		0.895
Durbin-Watson d-statistic	1.673		
Serial Correlation χ^2	5.413 (0.2475)		
Heteroskedasticity χ^2	43.00 (0.4282)		2.11 (0.147)
Autocorrelation χ^2 (L1)		25.6877 (0.899)	1.945 (0.163)
χ^2 (L1)		37.3123 (0.409)	
Causality Test χ^2			
- [lnGDP]LD.lnext		0.03 (0.8633)	
- [lnext]LD.lnGDP		0.00 (0.9899)	
Stability Test	Between the bounds	Between the bounds	
Notes: *, ** and *** denotes significant at 10, 5 and 1 percent significance level respectively. The ARDL model is selected based on HQIC criterion. The serial correlation test is based on Breusch-Godfrey Serial Correlation LM test, the heteroskedasticity test is based on Breusch-Godfrey test, and the stability test is CUSUM stability bound test. Numbers in parenthesis represents standard errors.			

In the short-run, the ARDL and Johansen approaches show that there is no causal effect between GDP and external debts. We also tested this issue in the Johansen approach by the Granger and Wald causality tests; results of these tests also support the finding that external debts do not cause GDP growth in the short-run.

In the long-run, according to the ARDL approach, we conclude that external debts have a statistically significant negative causal effect on GDP growth if all the other variables are held constant. According to the ARDL results, the coefficient of error correction term, ECT_{t-1} is estimated at -0.346 and is statistically significant at the 5% level. Its sign is correct, ensuring that the long-run equilibrium is attainable. This suggests that economic growth is adjusting moderately at 34.6 percent to changes in the explanatory variables before reaching equilibrium (Daud et al. 2013). The Johansen approach also suggests that external debts have a statistically significant negative causal effect on GDP growth in the long-run. According to the ARDL results, investment and tax revenue have a positive causal impact on GDP growth both in the short and long-run, while tertiary education has a negative causal impact on GDP growth.

In addition, we also modeled whether GDP has an impact on external debts. According to the results, GDP growth does not have a causal effect on short-term or long-term external debts.

We also carried out some diagnostic tests of the model's soundness. The ARDL approach is stable, and it has no serial correlation and heteroskedasticity problems. In diagnostic tests of the Johansen approach, the VAR and VECM results indicate that there are no autocorrelation, normality, or stability problems. These results suggest that the model is suitable for examining this issue.

As an additional check, an OLS model was also used. These results show that external debts have a negative impact on economic growth, however, the effect is not statistically significant in OLS. The OLS model does not have a linearity, multicollinearity, normality, residual, or heteroskedasticity problem.

We also applied a polynomial model to determine if there is any threshold on the impact of external debt on GDP. Results of this analysis are presented in Appendix A. Using these results, Figure 9 shows that, in the case of Turkey, a one unit increase in external debt stock increases the GDP growth until the external debt levels of 35.95% (stationary point).

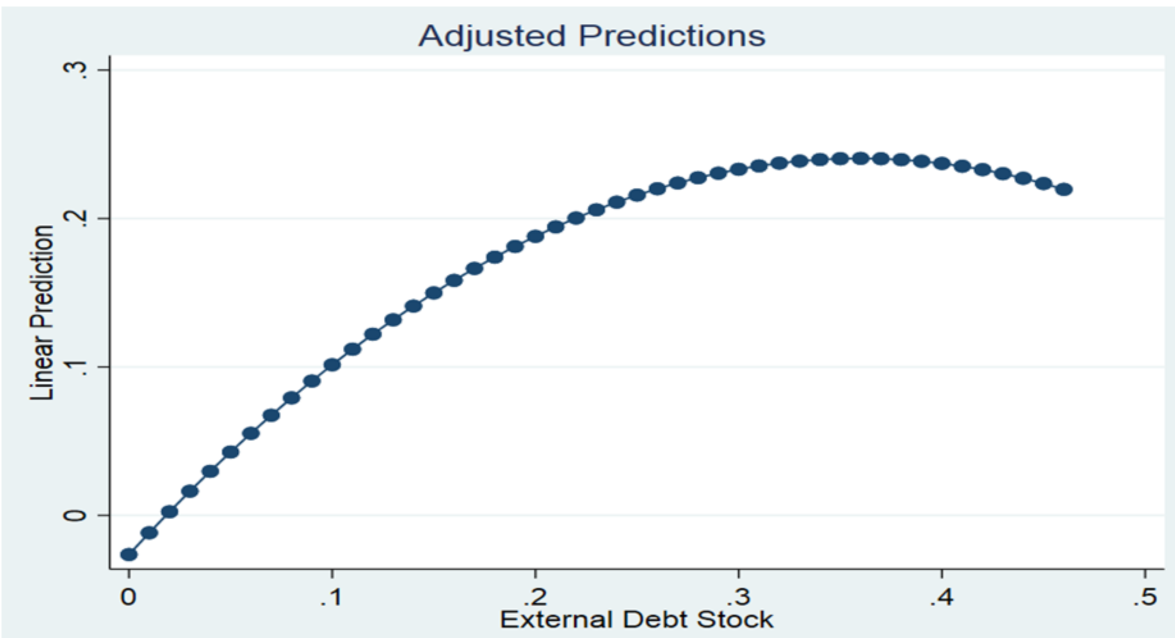

Figure 9. The Results of Polynomial Model for Threshold.

2.3.1. Syrian Refugee Crisis and Turkey's Debt

The issue of whether the Syrian Refugee Crisis has an impact on Turkey's external borrowing was also explored. In 2011, a civil war broke out in Syria right after anti-regime protests. Millions of Syrians have since sought asylum in other parts of the world. Turkey has been a notable destination for these migrants; more than 3.3 million registered Syrians have migrated to Turkey since 2011 (Salur and Erdoğdu, 2018).

To assess the impact of the Syrian Refugee Crisis, we applied a truncated model before and after 2011. The OLS and ARDL models, however, could not work with the same variables. Then, we applied the OLS and ARDL models with the variables of GDP and total external debt stock with quarterly data. The results are not statistically significant (Appendix B).

This finding is consistent with the manner in which Turkey has been addressing this crisis. Since 2011, Turkey has not borrowed any external credit from foreign markets to help finance expense related to the Syrian Refugee Crisis. Rather some foreign grants have been provided for this context (Public Debt Management Report, 2019). The remaining costs of the crisis have been covered by the Turkish government budget.

2.4. Conclusion

There are two main academic views in theory and academic literature regarding the relationship between external debts and economic growth. The first is that a “reasonable” level of external debt has a positive effect on growth. However, the second view, which considers debt overhang theories, argues that debt may have a negative effect on economic performance.

In addition, Rodrik (2009) studied the Turkish economy on points of economic growth, external borrowing, current account deficit, and financial crisis. According to Rodrik, a growth model that relies on foreign savings and large current account deficits can generate growth, but it runs into inherent problems. He recommended an alternative model of growth for Turkey that breaks the link between growth and the current account deficit whereby growth is domestically financed by increasing domestic saving. He argued that an increase in government saving will reduce capital inflows, prevent the current account deficit from rising, and help sustain a more competitive currency. This step is a critical element in moving Turkey to a new growth path. Finally, he concluded that Turkey has to learn to live with reduced reliance on external borrowing.

This study emphasizes whether or not foreign debts are used effectively in the Turkish economy. Our results reveal that current external debt practices have not contributed to economic growth. More specifically, our empirical results support the view that, in the case of Turkey, external debt have a negative impact on long-term. These results are consistent with general findings of other researchers including Pattillio et al. (2002) and Karagöl (2002). Thus, this study may help to persuade policymakers about the need for new approaches to be adopted regarding external debt.

CHAPTER 3

THE IMPACT OF THE FED's POLICIES ON EXTERNAL DEBTS OF TURKEY

3.1. Why are the FED's monetary policies important?

In the past few decades, the world has become more financially integrated. As a result of this globalization, the volume of international capital flows has sharply increased. Furthermore, the US financial system has become the main producer of safe assets for the global economy by acting as banker to the world: it borrows short from foreigners and invests long abroad. The main feature of the US financial system is the role it plays in providing financial intermediation to the global economy with the dollar, the key asset in the global financial system. In addition, the U.S. Federal Reserve (FED) has become a monetary superpower that sets global monetary conditions. The FED has considerable influence over global monetary conditions and because of this influence it is able to shape the growth path of global aggregate demand more than any other central bank in the world (Beckworth and Crowe, 2017).

The decisive role of the US economy and especially the FED policies were evident during the 2008 global crisis. With the emergence of the crisis in the US, economic instability quickly spread across the world and was later brought under control by U.S. economic policies.

Between 2002 and 2006 the FED engaged in a cycle of monetary easing that kept interest rates low. Besides this, there was a series of positive supply shocks from the liberalization of several Asian economies and the technological developments in the 2000s. These shocks contributed to productivity advances which, in turn put upward pressure on the global interest rates while putting downward pressure on inflation rates (Beckworth and Crowe, 2017).

In 2007, an economic crisis began in the subprime mortgage market in the US and which developed into a global crisis with the collapse of Lehman Brothers in 2008. After the collapse of

Lehman Brothers, the FED announced an unconventional monetary intervention, involving a $600 billion purchase of mortgage-backed securities in November 2008. According to Lim et al. (2014):

> *"This policy which has come to be known as quantitative easing (QE) was designed with the explicit purpose of bolstering weak asset markets, as well as stimulating real activity, given the perceived constraints of the zero-lower bound on short-term interest rates. Over the course of the succeeding five years, the FED engaged in a total of three separate QE episodes, so that by the beginning of the FED's gradual unwinding in January 2014, its balance sheet had more than doubled, to $4 trillion.*
>
> *Although QE was meant to be an expansionary monetary policy for the U.S. economy, the program had profound implications for developing countries. Faced with near-zero returns in the U.S. and other high-income countries many of which were implementing unconventional monetary policies of their own financial capital began to seek alternative sources of yield. Emerging economies, which had enjoyed heady growth rates and stable political-economic environments over the past decade, appeared to be an ideal investment alternative.*
>
> *... Over the four-year period between mid-2009 and the first quarter of 2013, cumulative gross financial inflows into the developing world rose from $192 billion to $598 billion, more than twice the pace compared to the far more modest increase of $185 billion between mid-2002 and the first quarter of 2006. Developing world equity markets also experienced substantial gains, and the many emerging economies that received substantial volumes of inflows relative to their GDP also saw significant appreciation of their real effective exchange rates (p.2-5)."*

The QE process culminated on December 18, 2013, when the FED decided to taper this policy by $10 billion per month, to $75 billion (Aizenmen et al. 2014). In January 2014, the FED began the tapering of asset market purchases, which marked the beginning of the end to the period of unconventional monetary policy (Lim et al. 2014). The tapering increased concerns in economies: potentially disruptive large-scale capital outflows from emerging markets as carry-trade activity is unwound in expectation of tapering, and hints of future interest rate increases. Large capital outflows could create disruptions in financial markets, and eventually real economic activity, in emerging markets (Aizenmen et al., 2014).

Lim et al. (2014) concluded that, of the 62% increase in overall inflows to developing countries related to changes in global monetary conditions between 2009 and 2013, at least 13% was attributable to QE. In addition, the results of Chen et al. (2015) show that the QE measures appear to have supported the recovery in emerging economies in 2009 and 2012, as well as contributed to their overheating in 2010 and 2011. Finally, based on IMF data, Beckworth and Crowe (2017) found that GDP growth in emerging and developing economies increased from a low of 3.0% growth in 2009 to an average of 6.9% growth in 2010 and 2011 with FED's monetary stimulus. On the other hand, Aizenmen et al. (2014) showed that emerging markets, especially fragile economies were affected by tapering announcements.

After the Global Financial Crisis, a number of papers were written on the FED’s quantitative easing and tapering policies. In these papers, the impacts of the FED policies on other economies are generally discussed in the context of the effects of a nearly global crisis. These studies generally include the effects of the FED policies on variables such as interest rates, foreign exchange rates, stock market returns or CDS spreads and, in all but a few, examined the impacts of either QE or tapering.

The goal of this study is to examine the impacts of the FED policies on the external debt of Turkey since 2003. Unlike other studies, the effects of the FED policies on a specific economic area were studied using a case study approach over a relatively long period.

In the literature, the debts of the public sector are generally highlighted. However, private debt is a beneficial and essential part of any economy. Debt, especially private debt, can be vital to powering economic growth. However, when it gets too high, debt begins to impede growth and debt becomes a burden. This can lead to financial problems, as was the case in the 2008 crisis in the U.S, the 1991 crisis in Japan, and the 1997 Asian Financial Crisis (Vague, 2016). Thus, in addition to the total gross external debt, how this debt is disaggregated across the economy - the public sector, private sector, and financial sector – is also analyzed in the empirical models in this Chapter.

3.2. Data and Methodology

In this analysis, Turkey's gross external debt stock for the period between 2003 and 2017 is examined using a time series method. To measure the effects of the FED policies on Turkish external debts, the size of FED assets, Federal Reserve Notes, and the M2 Money supply are chosen as independent variables.

According to James Bullard (2017), president and CEO of Federal Reserve Bank - St. Louis, the FED's balance sheet has been an important monetary policy tool during the period of near-zero policy rates.

The FED's balance sheet consists of assets and liabilities. Assets are comprised of three items: gold and foreign currencies, monetary policy assets, and other assets. On the liability side, there are notes, deposits, monetary policy liabilities, other liabilities, and equity. Notes refer to banknotes issued by the central bank that are in circulation (Ademuyiwa et al., 2018). The FED supplies notes to meet the demand for currency in the economy, so the release of banknotes is a key monetary policy tool. All monetary policies directly or indirectly affect the FED's balance sheet assets size (Rule, 2015); whenever the FED buys or sells its assets, the size of its liabilities increases or decreases. Thus, in this analysis we use the value of Federal Reserve Notes, and the value of total FED assets, independent variables which proxy for FED monetary policy; should, for example, the size of the asset holdings increase, it is assumed that the FED is pursuing expansionary monetary policy.

In addition, the money supply is another importance macroeconomic consideration, and features prominently in several economic theories such as the quantity theory of money. According to the FED (2019), *"the money supply is commonly defined to be a group of safe assets that households and businesses can use to make payments or to hold as short-term investments. There are several standard measures of the money supply. M1 is defined as the sum of currency held by the public and transaction deposits at depository institutions. M2 is defined as M1 plus savings deposits, small-denomination time deposits, and retail money market mutual fund shares."* The FED controls the supply of money by increasing or decreasing of the size of the Fed's balance sheet; specifically, by affecting currency in circulation plus the deposit balances that depository institutions hold with the Federal Reserve (Thornton, 2013). Therefore, we include M2 to the model as another independent variable.

Quarterly data between 2003 and 2017 is used in this analysis. All variables are log-transformed and, the Dickey-Fuller Test was used to test whether they have stationarity. As this test found that all the variables are not stationary, first differences of the variables which are nonstationary were used in the model.

As is described in Table 9, this data was obtained from the Turkish Treasury (Republic of Turkey Ministry of Treasury and Finance), the Federal Reserve Bank of St. Louis, the Central Bank of the Republic of Turkey, and the Turkish Statistical Institute.

Table 9: Data Description

Variable	Data Name	Source
External Debts (Total)	Gross External Debt Stock of Turkey	Turkish Treasury (Public Finance Statistics)
External Debts (Public Sector)	Gross External Debt Stock of Turkey	Turkish Treasury (Public Finance Statistics)
External Debts (Private Sector)	Gross External Debt Stock of Turkey	Turkish Treasury (Public Finance Statistics)
External Debts (Financial Sector)	Gross External Debt Stock of Turkey	Turkish Treasury (Public Finance Statistics)
The FED's Size of Assets	All Federal Reserve Banks: Total Assets, Millions of Dollars, Quarterly, Not Seasonally Adjusted	FED of St. Louis (Federal Reserve Economic Data)
Federal Reserve Notes	Liabilities: Federal Reserve Notes, Net of F.R. Bank Holdings, Millions of Dollars, Quarterly, Not Seasonally Adjusted	FED of St. Louis (Federal Reserve Economic Data)
M2 Money Stock	M2 Money Stock, Billions of Dollars, Quarterly, Seasonally Adjusted	FED of St. Louis (Federal Reserve Economic Data)
LIBOR on USD	3-Month London Interbank Offered Rate based on USD	FED of St. Louis (Federal Reserve Economic Data)
Real Effective Exchange Rate	Real Effective Exchange Rate	CBRT (Exchange Change Statistics)
Domestic Interest Rate	CBRT O/N Interest Rates	CBRT (Interest Rate Statistics)
Inflation Rate	Consumer price index	TSI (Inflation and Price Statistics)
GDP	Gross Domestic Product by Expenditure in Constant Prices: Total Gross Domestic Product for Turkey	FED of St. Louis (Federal Reserve Economic Data)
Notes: CBRT= Central Bank of Turkey. TSI = Turkish Statistical Institute.		

3.3. Empirical Results

Firstly, we use an OLS model to examine determinants of total debt stock. The models are tested by the Durbin-Watson test and the Breusch–Godfrey test for serial correlation (also known as autocorrelation), the VIF (Variance Inflation Factor) test for the multicollinearity and the

Breusch-Pagan test for heteroskedasticity. In addition to these tests, we also implemented normality and stability tests. Thus, the models are free from serial correlation, multicollinearity, heteroskedasticity, normality and stability problems.

The following model is used to assess how the U.S. FED's monetary policy affects Turkey's external debts:

$$ES_t = \beta_0 + \beta_1 FED_t + \beta_2 FED_{t-1} + \beta_3 LIBOR_t + \beta_4 TRexc_t + \beta_5 TRint_t + \beta_6 TRinf_t + \beta_7 TRgr_t + \varepsilon_t \qquad (3)$$

where ES_t denotes the external debt stock of Turkey in period t, FED_t denotes the all Federal Reserve Banks' total assets in period t, FED_{t-1} denotes the all Federal Reserve Banks' total assets in period $t-1$, $LIBOR_t$ denotes 3-Month London Interbank Offered Rate based on USD in period t. The real foreign exchange rate is denoted by $TRexc_t$, $TRint_t$ denotes the domestic REPO interest rate of Turkey in period t, $TRinf_t$ denotes the domestic consumer price index in period t, and $TRgr_t$ denotes real GDP growth rate of Turkish economy in period t. We also included Federal Reserve Notes and M2 money stock in place of FED_t in alternative model specifications.

3.3.1. Empirical Results of OLS

In Table 10, along with the FED variables, other the macroeconomic measures of Turkey's economy are included in the analysis as independent variables. GDP growth rate, inflation rate, real effective exchange rate and interest rate (O/N interest rate of Central Bank) are selected for the macroeconomic indicators regarding Turkey's economy. The real GDP growth rate and inflation rate are included as controls for demand. It is foreseen that the demand for the external sources of the rapidly growing economies would be relatively higher and that capital will also move more easily to the mentioned countries. The increase in the real effective exchange rate refers to the appreciation of TL which will lead economic actors with a greater ability to borrow from external markets. In addition, the LIBOR (3-Month London Interbank Offered Rate based on U.S. Dollar) is included in the analysis to reflect the cost of external borrowing.

Results indicate that total external debt stocks in Turkey respond to the lagged effect of the FED's asset size and Federal Reserve Notes. The coefficients of these variables have negative signs and are statistically significant at the 1% level for the FED's asset size, and at the 5% level for Federal Reserve Notes. For the M2 money stock, however, the coefficients are not statistically significant. These results show that the growth of the FED's assets size and Federal Reserve Notes negatively affect the external debts of Turkey. In other words, if we hold all the other variables constant *(ceteris paribus)*, the FED's expansionary quantitative policies decrease the external debts of Turkey while contractionary quantitative policies increase them.

Interestingly, LIBOR does not affect external debts. In addition, overall results show that the macroeconomic variables used in the model generally do not have an impact on external debt stocks.

An OLS model was also estimated. In this model, a dummy variable between 2008 and 2014 was included to indicate the period of QE. The results are not statistically significant.

Table 10: Results of OLS Models on Monetary Tools

Variable	Total Stock		
	(1)	(2)	(3)
Intercept	0.0200** (2.49)	0.0281** (2.08)	0.0271*** (2.71)
Total Stock (Lag)	0.313** (2.45)	0.325** (2.37)	0.232* (1.69)
LIBOR	-0.00672 (-0.66)	-0.000392 (-0.04)	0.000915 (0.09)
Real Exchange Rate	-0.0119 (-0.17)	0.0484 (0.65)	0.0551 (0.77)
Domestic Interest Rate	-0.0401 (-1.22)	-0.00831 (-0.24)	-0.0148 (-0.44)
Inflation Rate	0.125 (0.41)	0.00204 (0.01)	0.169 (0.49)
GDP Growth Rate	-0.237 (-1.31)	-0.0694 (-0.35)	0.0141 (0.08)
The FED's Total Assets	-0.0448 (-1.10)		
The FED's Total Assets (Lag)	-0.148*** (-3.14)		
M2 Money Stock		-0.578 (-1.07)	
M2 Money Stock (Lag)		-0.329 (-0.60)	
Federal Reserve Note			-0.453 (-1.55)
Federal Reserve Note (Lag)			-0.558** (-2.06)
R^2	0.31	0.16	0.21
Note: Standard errors are reported in parentheses. (*, **, ***) denotes significance at the (1, 5, 10) % level.			

3.3.2. Empirical Results of Causality Tests

In addition to the OLS approach, we also evaluated this model using the ARDL and Johansen cointegration approaches to explore causality between Turkey's debt and FED policy. In addition to the baseline specification noted above, we also included external debt stock of the public and the private sector to the ARDL model.

In the models, the first differences of all variables are stationary. Both the ARDL and Johansen Cointegration approaches indicate that the models are cointegrated so we can specify both short-run and long-run models.

Diagnostic tests using the Durbin-Watson, Breusch–Godfrey and Breusch-Pagan tests were used. Results of these tests found the models to be free from autocorrelation and heteroskedasticity.

Results of the ARDL and Johansen cointegration analyses, do not indicate that there is any causal effect between FED's total assets and total external debts of Turkey in the short-run. However, there is a causal effect between total gross debt stock and LIBOR, real exchange rate and GDP growth rate in the ARDL approach. Therefore, holding all the other variables constant *(ceteris paribus)* if there is an increase in the LIBOR, real exchange rate or GDP growth rate, the total gross external debt will decrease in the short run. The empirical results are presented in Appendices C through G.

On the other hand, we found some causal effects between the total external debt in the long-run. The results are, which consider both total debt stock and separately consider public and private debt stock are presented in Table 11.

Table 11: Results of ARDL and Johansen Models in the Long-Run

Variable	Total Stock	Total Stock	Public Stock	Private Stock
	Johansen	ARDL (1,0,1,4,0,0,1)	ARDL (1,1,0,1,0,1,0)	ARDL (1,0,0,0,0,0,1)
ECT_{t-1}		-.3423*** (.07481)	-.3012*** (.0835)	-.0762*** (.0227)
The FED's Total Assets	-.2803*** (.0754)	-.2393** (.11042)	-.3083* (.1618)	-1.4629*** (.6776)
LIBOR	-.0768*** (.0159)	-.0608*** (.0207)	-.1006*** (.0319)	-.1845 (.1203)
Real Exchange Rate	.3471*** (.1128)	1.251*** (.154)	-.8091*** (.2248)	2.1497*** (.6308)
Domestic Interest Rate	-.0521 (.0361)	.0081 (.05475)	-.0644 (.0619)	-.6472*** (.2782)
Inflation Rate	.6523*** (.2177)	.7809*** (.24176)	.7052* (.3879)	-1.2077 (1.4196)
GDP	1.2192*** (.2028)	1.1224*** (.3052)	.3657 (.3169)	6.5089*** (2.2302)
Adj. R-squared		0.6085	0.2459	0.6979

Notes: Standard errors are reported in parentheses. (*, **, ***) denotes significance at the (1, 5, 10) % level.

In Table 11, it is clearly seen that there is a causal effect from the FED's asset size to total gross external debt of Turkey in the long-run. Both the Johansen and the ARDL models provide that this causal effect is statistically significant. In other words, if all the other things are constant (*ceteris paribus*), the FED's expansionary quantitative policies cause a decrease in the total external debts of Turkey while contractionary quantitative policies cause this debt to increase. The FED's asset size has a negative causal effect both external debt stock of the public sector and the private sector as well. For the private sector, however, the coefficient is statistically significant at the 1% level, while it is statistically significant at the 10 % level for the public sector in the long-run. In the ARDL results, the coefficients of error correction terms (ECT_{t-1}) are negative and statistically significant at the 1% level. Their signs are correct, ensuring that the long-run equilibrium is attainable (Daud et al. 2013). In addition, except for domestic interest rate, all the other variables also have an impact on total gross external debts.

Results show that LIBOR has a negative causal effect on external debt stock while real exchange rate, inflation rate and GDP growth has a positive causal effect on it. Furthermore, the ARDL model has generally produced similar outputs for the public sector and the private sector as well. In the literature, GDP may have a positive impact on external debt, or its effect may be negative as well. GDP growth can help to decrease in external debt stock by domestically generating financial resources. Alternative financing generated from export-oriented sectors is the source of this relationship (Gokmenoglu and Rafik, 2018). For example, Hanousek and Shamshur (2011) find this negative relationship between GDP growth and debt stock. On the contrary, an increase in GDP growth rate may also propagate an increase in external borrowing. If an economy does not have enough savings or if it must access to affordable debt, then external debt may become a feasible way of financing (Gokmenoglu and Rafik, 2018). For instance, De Jong et al. (2008) argue that good economic conditions can lead to providing new borrowing. Kayo and Kimura (2011) also found a positive relationship between GDP growth and debt stock.

When we compare the ARDL and the Johansen approaches, the Johansen approach supports the ARDL approach and their results are similar. Table 11 shows that both models give similar causal effects, their coefficients do, however, differ. These results are likely due to differences in the estimation approach. While ARDL approach uses an ARDL model for the short-run and Error Correction Model for the long-run. However, Vector Autoregression model for the short-run and Vector Error Correction Model for the long-run are used in the Johansen approach. When one cointegration vector exists, ARDL approach gives better results than the Johansen approach. The ARDL model works irrespective of whether the underlying variables are I(0), I(1) or a combination of both. In addition, since each of the variables stands as a single equation, endogeneity is less of a problem in the ARDL technique because it is free of residual correlation. Finally, If the sample data size is small or finite, the ARDL error correction representation becomes relatively more efficient (Nkoro and Uko, 2016). Therefore, although the results of the Johansen approach support the results of the ARDL approach, given that having a small data size, we preferred ARDL outputs.

We also predict the impact of Federal Reserve Notes and M2 money stock with the ARDL approach. Table 12 shows that M2 money supply has a negative coefficient and it is statistically significant at the 10% level, but not at the 5% level. Federal Reserve Notes have a negative coefficient and is statistically significant at 1% level. According to these results, there are one-way negative causal effects from Federal Reserve Notes and M2 money stock to total external debt stock of Turkey. Thus, these results also support that the FED's assets size has a negative causal effect on external borrowing of Turkey.

Table 12: ARDL Model Results for Other Policy Tools

Variable	Total External Debt Stock		
	ARDL (1,0,1,4,0,0,1)	ARDL (1,0,1,0,0,0,1)	ARDL (1,0,1,0,0,0,1)
ECT_{t-1}	-0.3423*** (0.0748)	-.2173*** (.0528)	-.3996*** (-.3996)
LIBOR	-.0607*** (.0206)	-.0386* (.0214)	-.0431*** (.0111)
Real Exchange Rate	1.2510*** (.1547)	.6648*** (.2347)	.2244*** (.1502)
Domestic Interest Rate	.0081 (.0547)	.0156 (.0717)	.0072 (.0419)
Inflation Rate	.7809*** (.2417)	1.0749* (.6482)	.9001*** (.2378)
GDP	1.1224*** (.3052)	1.9923*** (.5703)	1.7691*** (.2888)
The FED's Total Assets	-.2394** (.1104)		
M2		-1.7736* (.9130)	
FED Notes			-1.4248*** (.2762)
Adj. R-squared	0.6085	0.3998	0.4709
Notes: Standard errors are reported in parentheses. (*, **, ***) denotes significance at the (1, 5, 10) % level. Notes: All models are free from heteroskedasticity and autocorrelation problems.			

3.4. Conclusion

The purpose of this study was to answer the questions of how the quantitative changes in the FED's balance sheet affect the gross external debts of Turkey and what the channels of effect are. Accordingly, the OLS results show that the FED's lagged expansionary quantitative policies decrease the external debts of Turkey. Interestingly, LIBOR did not have an impact on external debts. In addition, overall results show that the real exchange rate, domestic interest rate, inflation rate, and real GDP growth rate generally did not affect the external debt stocks.

On the other hand, the causality approaches support that there is a one-way negative causal effect from the FED's policies to total gross external debts of Turkey in the long-run. Therefore, if the FED carried out an expansionary monetary policy which led to an increase in the size of its assets, banknotes in circulation, and M2 money supply, then Turkey's external debts would decrease in the long-run. However, the empirical results cannot support whether there is a causal effect from the FED's policies to Turkey's external debt stock in the short-run.

In addition, according to the outputs of causality methods, we conclude that a rise on the real effective exchange rate, domestic inflation rate, or GDP growth rate would lead to an increase in Turkey's external debt stock, while an increase on the LIBOR would lead to a decrease in the external debt stock in the long-run.

Considering the spillover effect of QE to the emerging economies, it may appear that there is a contradiction in the results of the empirical model (Chen et al., 2015; Lim et al. 2014). However, we argue that the transmission of QE to gross inflows to developing countries include liquidity, portfolio rebalancing, and confidence channels. In Turkey, however, repo and bond markets are the deepest and the most functional financial markets according to the trading volume (the daily trading volume of these markets is about 4-5 trillion USD) (Borsa İstanbul, 2018). In addition, the equity and derivative markets in Borsa İstanbul, the national exchange entity, are another investment area in Turkey for hot money flow. Therefore, there is a high probability that capital inflows spread out after QE came in these markets. These markets are completely distinct from the external debts used in the model. All of this considered, the empirical model may be extended by including stock market variables.

Although we found some causal effects from the variables used in the models to external debt stocks, this part can be analyzed again by other variables to decide a precise judgment. For example, it would be more realistic to estimate the model with factors such as budget deficits, the maturity date of existing credits or the financing necessity of projects carried by state institutions regarding external debts of the public sector. Similarly, for the private sector agents, variables such as the maturity dates of existing loans or the investment demand of the private sector may affect their external debts (Peker and Bölükbaş, 2013) and (Aktugan, 2017).

CHAPTER 4

OVERALL EVALUATION

The main reason for external financing for both government and companies is insufficient domestic capital. Greater access to investible funds from abroad would provide a powerful boost to domestic investment and growth along with better consumption smoothing (Rodrik, 2009). In the beginning, external borrowing creates an increase in national income by ensuring capital formation. Then, capital accumulation induces an increment in investment and economic growth. However, the national income decreases when principal or interest amount of external debts are repaid. Therefore, external debts, according to the general view, should be canalized to the sectors which have high factor productivity such as an investment for the factor accumulation.

On the other hand, some countries – and perhaps a majority – are constrained primarily by poor returns. The essential problem here lies with inadequate investment demand due to either low social returns or low private appropriability of social returns. In such cases, capital inflows exacerbate the investment constraint through their effect on the real exchange rate. The real appreciation of the home currency which accompanies capital inflows reduces the profitability of investment in tradable goods and services and depresses the private sector's willingness to invest, thereby reducing economic growth (Rodrik, 2009).

Therefore, the amount, classification, maturity and area of usage of external debts could positively or negatively affect the economic growth performance of countries. Thus, external debts are a macro-economic issue that need to be monitored both for countries and the global economy.

In this paper, we analyzed external debts of Turkey, and attempted to determine whether or not external debts of Turkey have contributed to the economic growth. Furthermore, we also empirically studied the relationship between the FED's policies and Turkey's external debt.

Between 1970 and 2017, the results of the empirical analysis show that external financing had a negative impact on economic growth. According to the ratio analysis, as of 2017, while the external debt ratios for the public sector were healthier, the external debt burden of the private sector was one of the most important vulnerabilities for the economy. This situation exposes the Turkish economy to some economic risks such as exchange rate fluctuations and speculative attacks on the foreign exchange rate. The significant depreciation of TL against foreign currencies in 2018 also revealed this fact clearly.

Reducing the external debt burden can only be achieved through effective external debt management. Both the public and private sector should use the debts in productive areas. In terms of economic growth, it is important that the external financing provided by the private sector be steered to investment areas that have high export potential. To this point, we would like to propose a policy suggestion that external debt management authorities actively involve external debts to canalize or encourage them to the more efficient sectors. For instance, external debt management authorities may subsidize the private sector's foreign financing on research and development areas, or the sectors that have high export potential or value added. To eliminate the mentioned vulnerabilities, we also suggest that the structural adjustments started in 2017 with regards to the limitation of private sector external debt should be made actual as immediately as possible by forcing the pace. In this way, the companies not having sufficient foreign exchange resources will not borrow more than their repayment capacities.

Furthermore, the empirical results on the relationship between the FED's policies and external debt of Turkey show that the expansionary monetary policies of the FED led to a decrease in the external debt of Turkey, while contractionary policies had an increasing effect on it.

Briefly, the results revealed that although external debts are sustainable, the private sector's external credits have rapidly increased and external debts have not contributed to the growth in Turkey. Therefore, it appears that a new approach needs to be adopted in external debt management. In this context, this study may help to persuade policymakers to adopt proactive, economic growth-oriented policies for efficient use of external debts rather than current practices.

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APPENDICES

Appendix A

The Results of OLS Model with the Quadratic Term

Source	SS	df	MS			
				Number of obs	=	46
				F(2, 43)	=	7.90
Model	.311516552	2	.155758276	Prob > F	=	0.0012
Residual	.848139209	43	.019724168	R-squared	=	0.2686
				Adj R-squared	=	0.2346
Total	1.15965576	45	.025770128	Root MSE	=	.14044

dlnGDP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
dlnext	1.484942	.3819862	3.89	0.000	.7145937	2.255291
ext2	-2.065419	.6924258	-2.98	0.005	-3.461829	-.6690091
_cons	-.0263819	.0349838	-0.75	0.455	-.0969335	.0441697

Appendix B

The Results of OLS Model Applied for the Syrian Refugee Crisis

Source	SS	df	MS			
				Number of obs	=	26
				F(3, 22)	=	0.76
Model	.000473122	3	.000157707	Prob > F	=	0.5258
Residual	.004535548	22	.000206161	R-squared	=	0.0945
				Adj R-squared	=	-0.0290
Total	.005008669	25	.000200347	Root MSE	=	.01436

dlnGDP	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ldlnGDP	-.2277369	.2168138	-1.05	0.305	-.6773811	.2219073
dlnext	-.0256581	.1303535	-0.20	0.846	-.2959946	.2446784
ldlnext	.0931571	.1204963	0.77	0.448	-.1567369	.3430511
_cons	.0167311	.0046601	3.59	0.002	.0070667	.0263955

Appendix C

Results of Estimated Short-Run Coefficient Using the Johansen Cointegration Approach

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	D_lnGDP	D_lnext	D_lninvest	D_lntax	D_open	D_lntert
L._ce1	-0.0628*	-0.0400*	-0.0101	-0.0337	0.0272***	-0.0223
	(0.0338)	(0.0226)	(0.0439)	(0.0340)	(0.00834)	(0.0162)
LD.lnGDP	-0.216	-0.00399	-0.387	0.157	0.0440	0.228
	(0.468)	(0.314)	(0.609)	(0.472)	(0.116)	(0.225)
LD.lnext	0.0430	0.303*	-0.230	-0.119	-0.0598	-0.132
	(0.250)	(0.167)	(0.325)	(0.252)	(0.0617)	(0.120)
LD.lninvest	-0.247	-0.105	-0.215	-0.294	0.0392	-0.125
	(0.291)	(0.195)	(0.378)	(0.293)	(0.0719)	(0.140)
LD.lntax	0.340	-0.0388	0.751**	0.267	0.0374	-0.0334
	(0.289)	(0.194)	(0.376)	(0.291)	(0.0715)	(0.139)
LD.open	-0.575	-0.541	-0.595	-0.407	0.360	0.125
	(0.924)	(0.618)	(1.202)	(0.931)	(0.228)	(0.444)
LD.lntert	0.175	0.317	0.678*	0.245	-0.00583	0.477***
	(0.302)	(0.202)	(0.393)	(0.304)	(0.0747)	(0.145)
Constant	-0.0154	0.00648	0.0404	0.0308	0.0419***	0.0180
	(0.0565)	(0.0378)	(0.0735)	(0.0569)	(0.0140)	(0.0272)
Observations	44	44	44	44	44	44

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Appendix D

ARDL EC MODEL results

D.lnstock	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ADJ						
lnstock						
L1.	-.3422949	.0748114	-4.58	0.000	-.4932705	-.1913193
LR						
lnFED	-.2393729	.1104244	-2.17	0.036	-.4622183	-.0165276
lnLIBOR	-.0607607	.020669	-2.94	0.005	-.1024724	-.0190489
lnTRexc	1.251008	.15474	8.08	0.000	.9387297	1.563285
lnTRint	.0080742	.0547494	0.15	0.883	-.1024144	.1185629
lnTRinf	.7809406	.2417635	3.23	0.002	.2930422	1.268839
lnGDP	1.122402	.30521	3.68	0.001	.5064633	1.738341
SR						
lnLIBOR						
D1.	-.0339383	.0138198	-2.46	0.018	-.0618278	-.0060487
lnTRexc						
D1.	-.27254	.0800808	-3.40	0.001	-.4341496	-.1109305
LD.	-.1713413	.0673923	-2.54	0.015	-.3073445	-.035338
L2D.	-.2702299	.0593258	-4.56	0.000	-.3899543	-.1505055
L3D.	-.159015	.0526505	-3.02	0.004	-.265268	-.052762
lnGDP						
D1.	-.5699902	.1570487	-3.63	0.001	-.8869273	-.2530531
_cons	.3040679	.4071834	0.75	0.459	-.5176615	1.125797

Appendix E

Pesaran/Shin/Smith (2001) ARDL Bounds Test

H0: no levels relationship F = **12.560**

t = **-4.575**

Critical Values (0.1-0.01), **F-statistic**, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	**2.12**	**3.23**	**2.45**	**3.61**	**2.75**	**3.99**	**3.15**	**4.43**

accept if F < critical value for I(0) regressors
reject if F > critical value for I(1) regressors

Critical Values (0.1-0.01), **t-statistic**, Case 3

	[I_0] L_1	[I_1] L_1	[I_0] L_05	[I_1] L_05	[I_0] L_025	[I_1] L_025	[I_0] L_01	[I_1] L_01
k_6	**-2.57**	**-4.04**	**-2.86**	**-4.38**	**-3.13**	**-4.66**	**-3.43**	**-4.99**

accept if t > critical value for I(0) regressors
reject if t < critical value for I(1) regressors

Appendix F

```
.
. *(4)- Perform Johansen cointegration test with (p) lags
.
. vecrank lnstock lnFED lnLIBOR lnTRexc lnTRint lnTRinf lnGDP, trend(constant) lags(1)

                          Johansen tests for cointegration
Trend: constant                                            Number of obs =      59
Sample:  1960q3 - 1975q1                                            Lags =       1
```

maximum rank	parms	LL	eigenvalue	trace statistic	5% critical value
0	7	653.22304	.	196.9494	124.24
1	20	693.78203	0.74713	115.8315	94.15
2	31	715.02346	0.51327	73.3486	68.52
3	40	730.2478	0.40314	42.8999*	47.21
4	47	742.56505	0.34133	18.2654	29.68
5	52	749.01715	0.19645	5.3612	15.41
6	55	751.54134	0.08201	0.3128	3.76
7	56	751.69776	0.00529		

Appendix G

VAR Short-Run Results

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
lnstock						
lnstock						
L1.	.8698232	.0469774	18.52	0.000	.7777492	.9618972
lnFED						
L1.	-.0722831	.0306445	-2.36	0.018	-.1323451	-.012221
lnLIBOR						
L1.	-.0120655	.0064267	-1.88	0.060	-.0246615	.0005306
lnTRexc						
L1.	.1054852	.0575704	1.83	0.067	-.0073507	.218321
lnTRint						
L1.	-.0063828	.0148262	-0.43	0.667	-.0354417	.022676
lnTRinf						
L1.	.131468	.0995613	1.32	0.187	-.0636685	.3266045
lnGDP						
L1.	.1725748	.0820057	2.10	0.035	.0118466	.3333031
_cons	.7345685	.4619599	1.59	0.112	-.1708562	1.639993