

DETERMINANTS OF BANK LENDING IN TURKEY

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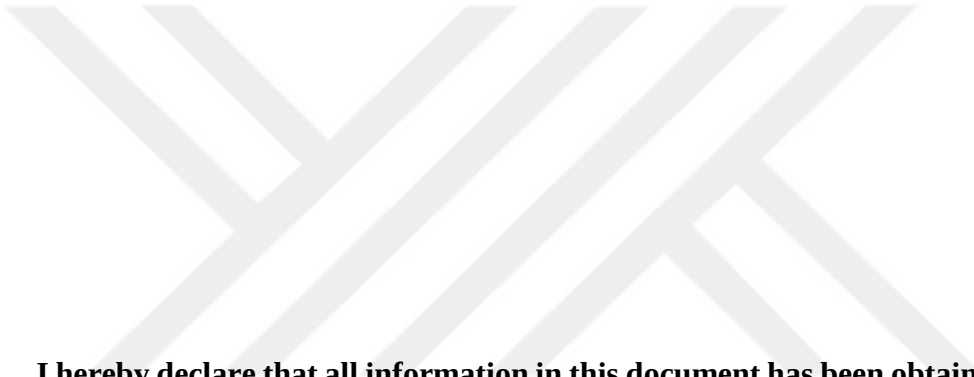
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ABSTRACT

DETERMINANTS OF BANK LENDING IN TURKEY

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As one of the most important elements of the financial system, bank loans significantly affect both the real economy and financial markets. As a result, it is crucial to analyze the determinants as well as the dynamics of bank loans through time. In this study, the determinants of total loans, corporate loans, and consumer loans in the banking sector of Turkey are examined for the period 2005Q1-2019Q4 via an Autoregressive Distributive Lag Model (ARDL). The volume of domestic currency deposits and foreign currency deposits in the banking sector, the exchange rate, real GDP, the consumer price index (CPI), and the policy rate are selected as the explanatory variables of the econometric models. Estimation results show that, as an indicator of the lending capacity of the banks, the loan volume is positively related to the deposit volume, economic growth encourages the loan growth, the depreciation of the domestic currency discourages the loan growth, and the overnight borrowing interest rate, as a proxy of the policy rate and inflation rate, showed no significant effect. Furthermore, the study demonstrates that the effects of the variables on credit growth differ depending on the term (short or long) and the type (consumer or corporate). This study contributes to the literature by analyzing bank loans in short and long terms for different loan types.

Keywords: Bank Lending, Autoregressive Distributive Lag Model

ÖZ

TÜRKİYE’DE BANKA KREDİLERİNİN BELİRLEYİCİLERİ

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Banka kredileri, finansal sistemin en önemli unsurlarından biri olarak gerek reel ekonomiyi gerekse finansal piyasaları önemli ölçüde etkilemektedir. Kredilerin bu rolü, banka kredilerinin seyrini belirleyen dinamiklerin analiz edilmesini kaçınılmaz kılmıştır. Bu çalışmada, Türkiye’de banka kredilerinin belirleyicileri incelenmiştir. Çalışmada, 2005Ç1-2019Ç4 dönemi seçilmiş, otoregresif dağıtılmış gecikme modeli kullanılmıştır. Bankacılık sektöründeki yerli para cinsi ve yabancı para cinsi mevduat hacmi, döviz kuru, reel GSYH, tüketici fiyat endeksi (TÜFE) ve politika faizi gibi seçili değişkenler kullanılarak bankacılık sektöründeki toplam krediler, ticari krediler ve tüketici kredilerinin seyri açıklanmıştır. Çalışmada kurulan model sonuçları genel olarak, bankacılık sektörünün kredi verme kapasitesinin göstergesi olarak mevduat hacminin kredi hacmi ile pozitif ilişkide olduğu, ekonomik büyümenin kredi büyümesini teşvik ettiği, yerli paranın değer kaybının kredi büyümesine negatif etki ettiğini, enflasyonun ve politika faizi olarak seçilen gecelik borçlanma faizinin ise kredi hacmine anlamlı bir etkisinin olmadığını göstermiştir. Ayrıca, çalışma kredi büyümesini açıklamada kullanılan değişkenlerin döneme göre (kısa ve uzun dönem) ve farklı kredi türlerine göre (bireysel ve ticari) farklı etkileri olabileceğini göstermiştir. Bu çalışmanın literatüre katkısı banka kredilerinin kısa ve uzun vadeli olarak farklı kredi türleri için incelemesidir.

Anahtar Kelimeler: Banka Kredileri, Otoregresif Dağıtılmış Gecikme Modelleri



To My Family

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CHAPTER 1

INTRODUCTION

Economic activity is determined by the consumption and investment expenditures of economic agents. Sustainability of the expenditures of economic agents brings about long-term economic growth and affects social welfare significantly. Consequently, the sustainability of consumption and investment expenditures depends on the financing of these expenditures. In modern economic systems, the necessary financing to support the sustainability of these expenditures is provided with the help of the financial sector.

In economic systems, some of the economic agents may have surplus funds (savings), while others may need funds. It is up to the financial institutions providing financial intermediation in the financial sector to bring together those have need and those have surplus of funds and to ensure the efficient distribution of funds (resources). Most of the financial intermediation transactions are carried out by banks. Banks borrow the funds from the agents with surplus funds in return for a certain interest payment and lend it to the agents in need of funds in return for a certain interest payment. While doing this, banks solve the information asymmetry problem and distribute the total available funds in the economy between economic agents. In this way, they provide financing to the real sector (firms) with the financial intermediation services of the financial sector. This will support investments and hence increase production capacities of firms. In addition, financial sector stimulates the economic activity by supporting the demand for durable and non-durable goods through lending to individuals (consumers). Therefore, financial intermediation contributes to the efficient use of economic resources, economic growth and social welfare by decreasing the disruptions that would otherwise arise from the information asymmetry among the economic agents. Bank loans are the unique financial products that are produced specifically by the most important financial intermediaries around the world that is the banking sector.

In particular, with the development and deepening of international financial systems, effects of financial markets on economic activity increased. Especially for emerging market economies globalization of financial markets brought new challenges, Prasad (2003) considers that in theory financial globalization has several benefits such as enhancing growth, there is significant risk of macroeconomic volatility. Global financial crisis in 2008 showed the importance of effective functioning of the financial markets. After this experience, policies regarding financial markets gained importance, and bank loans began to be examined more carefully due to its impact on both financial markets and economic activity. Origins of 2008 financial crisis is associated with asset price bubble (Orlowski, 2008 and Bailly et al., 2008). Excess liquidity, which is mostly the result of excess credit growth is the main factor that drives asset price bubbles. After the global financial crisis asset prices and liquidity in the financial markets became crucial elements that are scrutinized by policy-makers and academics. Excessive credit growth is generally seen as indicator of future problems in financial sector (Gersl and Seidler, 2010). Therefore, credit growth became an indicator closely monitored by policy-makers. In this context, understanding the factors that affect the credit growth is important in order to ensure efficient functioning of credit mechanisms (inefficiency in these markets could boost asset prices due to excess liquidity as experienced in 2008) and to ensure efficient distribution of resources and sustain economic growth.

Financial sector agents, institutions and products are more diverse in the developed countries in general. In Turkey, financial intermediation function is carried out mostly by banks and volume of bank credit enormously increased in recent years. Ratio of total bank loans to gross domestic product was 24 percent at the end of 2006 and it reached 59 percent at the end of 2019.¹ When we look at the development of the banking sector in Turkey, it is seen that the banking sector has started to develop since the 1990s, and the effective use of banking products, especially loans, has increased over time. After the dual crisis of banking sector and foreign exchange market in 2001, important regulatory changes were made especially in the banking sector to improve the institutional strength of the banking system. Similarly, the global financial crisis

¹ Volume of total bank loans in the end of the year are divided to sum of nominal gross domestic product of four quarter of relevant year.

of 2008 resulted in new regulations in financial sector to improve the health of financial system and to contribute to the financial stability. For example, Dodd-Frank Act is enacted in the US and similar regulations are applied across countries.² After the 2008 crisis, the CBRT added financial stability to its agenda. Monitoring credit growth became more crucial due to effects of credit growth on financial stability. In addition to the role of credit growth on financial stability, bank credits play a crucial role in the monetary transmission mechanism. As it is stated in the credit view, monetary policy effects supply of bank loans via bank lending channel and balance sheet channel.

Aim of this study is to analyze the factors that determine the credit growth in Turkey. In this study, determinants of total loans, corporate loans and consumer loans are analyzed for sample period of 2005q1-2019q4. Autoregressive Distributive Lag Model (ARDL) model is applied to examine short-term and long-term effects explanatory variables which are deposits in domestic currency, deposits in foreign currency, gross domestic product (GDP), exchange rate (Usd/Try), policy rate of Central bank of Republic of Turkey and consumer price index (CPI).

The literature that aim to explain credit growth at the macro level can be grouped into two; Some of the studies focus on single country case to examine dynamics of credit growth and some studies use multi-country data to analyze cross-country differences of dynamics of credit growth. In general, the empirical models use macroeconomic indicators such as inflation, economic growth and exchange rate, and banking-specific variables that affect the credit behavior of banks.

There are not many studies that focus on Turkey. Existing studies mostly focus on short-term effects of selected explanatory variables and focus on total loans. This study contributes to the literature two ways. Firstly, short-term and long-term dynamics of credit growth are analyzed separately with the help of the ARDL methodology. Secondly, total loan growth is disaggregated in to consumer and corporate loans and short-run and long-run dynamics of these different loan types are examined separately. Our study is the first study for Turkey that makes that distinction. In this way, this study

² For more details, see Eichgreen (2010) and Guynn et al. (2010)

contributes to the literature and it can give new provide new evidence that can be used by policy makers.

Rest of the study is organized as follows. The second chapter, the monetary policy framework of the CBRT and its transformation of the policy framework after the 2001 crisis and the 2008 crisis, are discussed. In the third chapter, the credit growth literature is surveyed. In the fourth chapter, the data and methodology are presented. In the fifth chapter, estimation results of the study are presented and compared with the examples in the literature. Finally, chapter six concludes the study.



CHAPTER 2

REVIEW OF MONETARY POLICY IN TURKEY

In this section, the monetary policy frameworks implemented by the Central Bank of the Republic of Turkey (CBRT) after the 2001 economic crisis are discussed. The post 2001 period can be divided into three basic periods based on the of emphasis of the monetary policy strategy of the CBRT. One can summarize the period between the years 2002 – 2005 as the implicit inflation targeting regime while the period 2006-2010 as the inflation targeting regime and finally post-2010 as of a period of policy mix in which alternative policy tools are used in monetary policy while financial stability emerged as the second goal besides the price stability goal.

2.1 Central Bank Policies after 2001 Crisis

Before February 2001, the Central Bank of the Republic of Turkey had a monetary policy regime that aimed to combat inflation by targeting the nominal exchange rate. In the pre-crisis period, the exchange rate was allowed to fluctuate within a certain band. In the program announced, it was stated that the basket exchange rate would be increased between 2.1 and 1 percent per month as of December 1999. In the period between July 2001 and December 2002, it was announced that the exchange rate would be allowed to fluctuate in the band gap, which will be gradually increased from 7.5 percent to 22.5 percent (CBRT,1999).

The CBRT intervened in case the exchange rate fell outside the determined band. After the 2001 crisis, some changes were made in the CBRT law, increasing the transparency and accountability of the bank and strengthening its independence. In addition, it was emphasized that the main goal of the CBRT is to ensure price stability. These changes facilitated transitioning the policy strategy towards inflation targeting regime in the post-crisis period. During this period the following changes are made:

Adopting Flexible Exchange Rate; After the 2001 crisis, the exchange rate-based stabilization program was terminated. With the joint decision of the Central Bank and the Government, a floating exchange rate regime was introduced.

Adopting “Transition to Strong Economy Plan”; Strong Economy Program was put into force in May 2001. Basic aims of this program are as follows; Taking measures for the banking sector,

- Ensuring “fiscal discipline”,
- Taking the initial steps of structural reforms,
- Using macroeconomic policies effectively to manage inflation and sustainable growth.

Changes in CBRT Law; The amendment made in the Central Bank Law in May 2001. According to this new CBRT Law;

- Achieving and maintaining “price stability” has been determined as the main objective of the Central Bank,
- The bank has been entrusted to take the necessary measures in order to ensure price stability,
- CBRT is to support the growth and employment policies of the Government, provided that it does not conflict with the “price stability” objective of the Central Bank,
- CBRT has been empowered with the authority of implementing monetary policy
- The Central Bank is to determine on its own discretion the monetary policy that it will implement and the monetary policy instruments that it will use to achieve this primary goal (instrument independence),
- The practice of financing the deficits of the Treasury and other public institutions has been terminated,
- Monetary Policy Committee (MPC) was established in order to have an institutionalized process of monetary policy decision making,

(CBRT, n.d.)

Implementation of the inflation targeting regimes require suitable macroeconomic and legal conditions. The reform policies after the 2001 crisis aimed to create the infrastructure for inflation targeting regimes. Most of necessary legal reforms are applied after 2001 crisis but still some preconditions were not satisfied.

Primary precondition for implementing inflation targeting regime, is the central bank independence. Secondly, central banks should be able to use the appropriate instruments to fight inflation, that is, inflation targeting central banks should have instrument independence. Additionally, the central bank must be prohibited from extending loans to the public sector and there must be a legal commitment to inflation targeting. Finally, in economies that will implement inflation targeting, the financial sector must be sound, fiscal dominance must not be present, and central banks must adhere to the principles of transparency and accountability.

Even though the institutional preparations were instigated in the Turkish case, it was still not enough to meet the necessary conditions for the inflation targeting regime. Therefore, full transition to the inflation targeting regime was delayed. For this reason, initially between 2002-2005, implicit inflation targeting regime was adopted. Main reasons for not fully transitioning to inflation targeting were: continuing reforms on banking sector, existence of a pricing behavior rooted on the previous period's inflation, strong exchange rate pass through on inflation and continuing “fiscal dominance” on the economy. Under these circumstances, it was thought that a policy based on monetary aggregates would fail, and it would be premature to switch to an inflation targeting regime. (Özatay, 2019)

In this framework, implicit inflation targeting regime was applied by the CBRT between 2002-2005. In this period, while it has been looked forward to necessary conditions (transitioning to inflation targeting) to emerge on the one hand, a series of policy steps were taken on the other. For instance;

Money Base: In this period, CBRT and government jointly determined inflation targets annually. “Base Money”, was also used as an additional anchor and “Base Money Targets” targets were set together with inflation target.

Transition to New Turkish Lira (Money Reform): With the transition to New Turkish Lira, 6 zeros were removed from Lira. This reform was also an indicator of the confidence in the permanence of the gains achieved.

Turkish Statistical Institute (TURKSTAT) Changes: Another development experienced in the transition period between 2002-2005 is the comprehensive changes made in the price indices of TURKSTAT. (CBRT; n.d)

In the implicit inflation targeting regime implemented between 2002 and 2005, the main goal of the CBRT was to ensure price stability. The inflation target was announced publicly at the beginning of the year, and the CBRT's policy rate was determined according to the gap between the targeted inflation and the realized inflation. Furthermore, CBRT announced the reasons for its decision on the policy rate to the public. It also made presentations to the parliament and the council of ministers twice a year. Communication policy was used effectively. For these reasons, the policies implemented had the feature of “inflation targeting”. On the other hand, some aspects of this period did not have the characteristics of an inflation targeting regime. The Monetary Policy Committee meet regularly but did not make any interest rate decision. Meetings are set up to formulate proposals for interest rate decisions. Within the framework of these recommendations, the interest rate decision could be taken at any time. The Inflation Report, which includes the CBRT's inflation forecasts and the CBRT's possible policy steps, was not published. For these reasons, the regime had an “implicit” feature then. (Özatay, 2019)

The implicit inflation targeting regime was successful despite adverse global atmosphere and conditions such as the Iraq War. The implicit inflation targeting regime that started in 2002 brought a gradual decrease in the annual inflation rate until 2005. (Figure 1) In this period, CBRT interest rates also followed a stable downward trend parallel to the downward trend in inflation. (Figure 2)

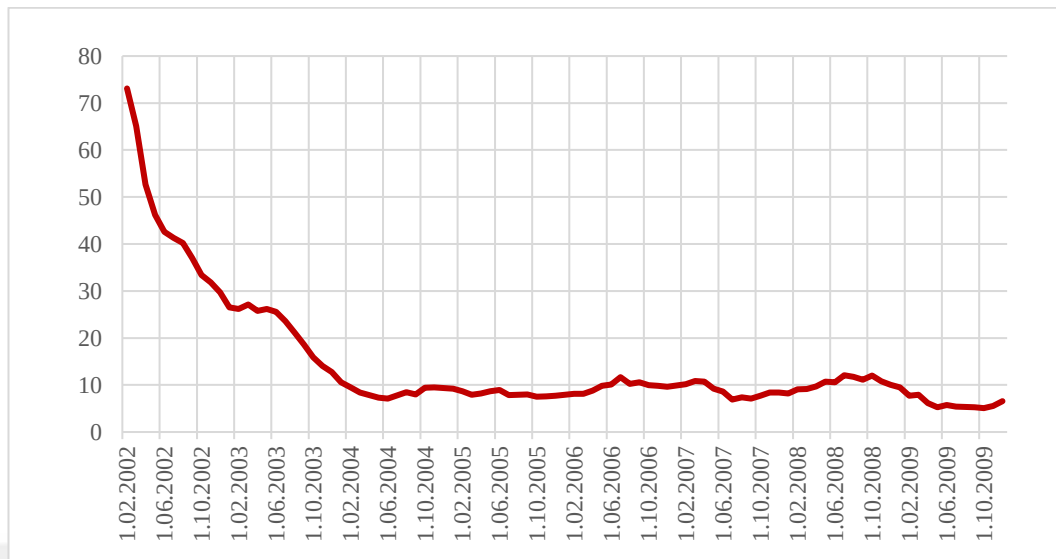


Figure 1 Annual Inflation Rate in Turkey (CPI, Annually, %)

Source: TURKSTAT

During the 2002-2005 period inflation rates never exceeded the targets, Turkey's credit risk in international markets has reached historically low levels, banking sector acquired a healthier structure, the borrowing need and the public sector debt has decreased. All of these developments supported the idea that the “inflation targeting regime” could be adopted. With these favorable conditions, a complete transition to the inflation targeting regime was realized in 2006. With the implementation of inflation targeting regime, inflation targets were determined and publicized. In this period, consumer inflation, although it is open to external influences, was chosen as the inflation target in order to cover the reputational risk. MPC started to determine the policy rates and inflation report was published quarterly. Initially, the inflation target was determined as 5 % for 2006 and 4 percent for 2007 and 2008. With the onset of turmoil in global markets in 2006, the global risk appetite decreased. Under these conditions, as inflation deviated from its target levels, the CBRT increased interest rates (Figure 2).

In 2007, political tensions increased due to the presidential elections, and budgetary discipline is loosened. In addition, increases were observed in global energy and food prices. The global financial crisis that started in the USA in 2008 increased the uncertainties. Volatility in exchange rate and interest rates started to cause volatility in Turkey's credit risk. As of October, energy and commodity prices started to decline due

to falling global demand. In this environment, volatility began to be observed in inflation forecasts and levels. As a result of the contraction in the economy, the CBRT started to decrease the policy rate as of November 2008. Thus, inflation remained above the targeted levels between 2006 and 2008. Inflation targets, which were previously announced as 4 percent for 2009 and 2010, have been updated as 7.5 percent and 6.5 percent, respectively. (Özatay, 2019)

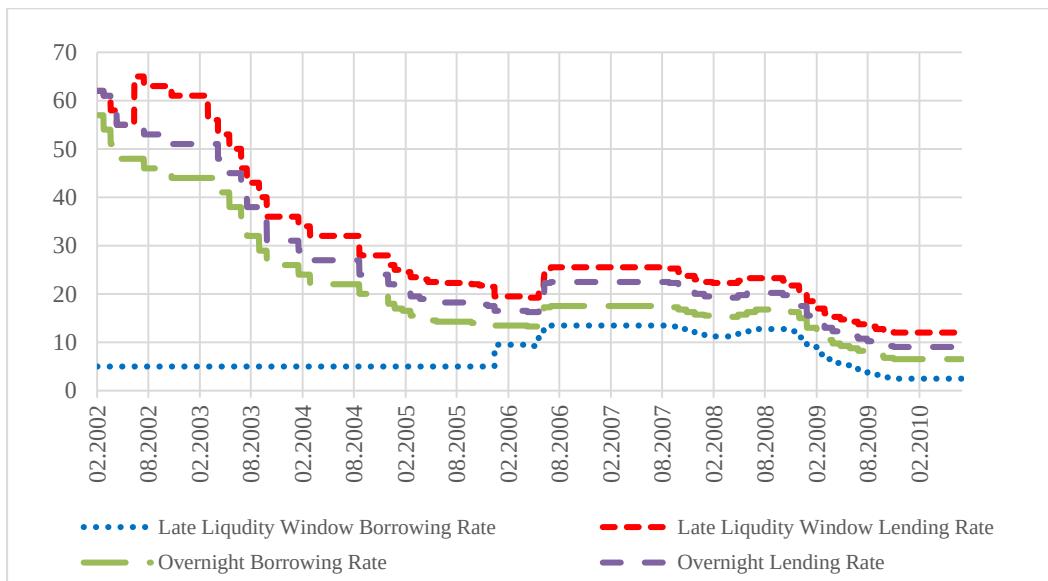


Figure 2 Interest Rates applied by CBRT for liquidity management (2002-2010)

Source: CBRT

Figure 1 and 2 together show that the policy steps taken after the 2001 crisis, especially enhanced independence of the Central Bank, induced a decreasing trend in inflation and accordingly in the interest rates applied by the CBRT.

A close look at the operational framework of the post-2001 monetary policy shows that the excess liquidity in the system was withdrawn through overnight transactions through the funding channels shown in Figure 2.

The expansion in central bank balance sheet that emerged during the regulations made after the 2001 crisis in Turkey caused an excess of liquidity in the banking sector between the years 2002-2010. Since the money in banking system is partially returned to the CBRT, the CBRT borrowing rate has been called the CBRT's policy rate for these years. It is observed that the lower limit of the late liquidity window was constant at

5% between 2002 and 2006 and the interest rate corridor was determined symmetrically throughout these years. Especially from 2006 on, it is observed that the upper and lower limits of the interest rate corridor and the upper and lower limits of the late liquidity window move together. (Eksi and Ekşi, 2018)

It is known that as of 2010, the CBRT, which withdrew excess liquidity in the banking system, became the liquidator to the system. When the period between 2002 and 2010 is evaluated together the gradual transitioning of the CBRT to inflation targeting regime can be deemed successful. The policy steps taken during these years resulted in a steadily falling inflation rate and, accordingly, the downward trend of the CBRT policy rate. As of 2010, it can be said that monetary policy was implemented with a new framework by introducing new instruments brought by the 2008 global crisis.

2.2 Central Bank Policies after 2008 Global Financial Crisis

The experience of the 2008 global financial crisis has shown how crucial the stability of a financial systems is. With the increase in global risk appetite and the volatility in capital movements after the crisis, financial stability, as a policy target included in the agenda of policy makers. Under these circumstances, CBRT decided to make some adjustments in the inflation targeting regime that it had implemented since 2006. The value of the exchange rate, financial capital flows and credit expansion were added the CBRT agenda in this period, as in other developing country central banks, and were announced in official policy texts. General understanding in the post 2008 period is that, especially for emerging market economies, capital flows could result in rapid credit growth and overvaluation of the domestic currency, which could be risky for financial stability. Thus, the policy agenda focused on possible side effects of capital flows that is rapid credit growth and overvaluation of domestic currency.

More specifically, movements in capital flows and global liquidity cycles show their reflections in Turkey mainly in the form of fluctuations in loans and exchange rates. In emerging economies such as Turkey, firm balance sheets, which are positively affected by the rapid appreciation of the domestic currency, can lead banks to extremely

rapid loan growth. Both the rapid credit growth and the overvaluation observed in the exchange rate deteriorate the resource allocation in the economy and cause the domestic demand to grow faster than the total income, thus negatively affecting the macroeconomic stability. “Rapid credit growth”, in the economic literature, also stands out as one of the important variables that precede financial crises. The overvaluation in the exchange rate, in an open economy, on the other hand, can have a distorting effect on macroeconomic and financial stability by increasing the systemic risk through many channels, especially the balance sheet channel. On the other hand, a sudden contraction in loans or excessive depreciation in the local currency are also undesirable in terms of macroeconomic and financial stability. Therefore, in order to soften the effects of volatility in capital flows, it is important that loans grow at reasonable rates and that the developments in the exchange rate are compatible with economic fundamentals. The policy framework developed by the CBRT for this period needs to be evaluated from this perspective. After 2010, the CBRT has diversified its tool set by adopting a different monetary policy framework design that also considers financial stability. For this purpose, the CBRT has developed new instruments such as the interest rate corridor and the Reserve Option Mechanism (ROM) in the years (2010-2012) in order to support financial stability without compromising price stability. (CBRT, 2012). CBRT continued its new policy framework established in 2010 with new instruments targeting financial stability mentioned below.

2.2.1 New Tools in post-2008 crisis period

After 2008 crisis reserve requirements, reserve option mechanism and asymmetric interest rate corridor became vital part of central bank policy for financial stability and price stability targets.

i) Reserve Requirements

Within the framework of the new policy, the required reserves of the banks became an active policy tool. Reserve requirement are used to effect banks’ lending behavior. Credit growth containment is targeted by increasing required reserves as explained

below. In order to increase the effectiveness of reserve requirements as a policy instrument, interest payment on the bank reserves are ended. and required reserve ratios are adjusted according maturities of deposits.

Study of Başçı and Kara (2012) considers that in the last quarter of 2010, the deterioration in the current account balance and the acceleration in credit expansion together with the strong capital inflows increased the need to take precautions. In that specific conjuncture, an increased interest rate response to rapid credit expansion would be risky, causing an increase in macro-financial imbalances by encouraging capital inflows. Thus, alternative policy options were needed. In this atmosphere, the CBRT has implemented a strategy that aims to deter capital inflows by keeping short-term interest rates low, and to slow down the rate of loan growth by increasing the reserve requirement ratios. In addition, extending the maturity of liabilities of the financial system has also been adopted as a supporting objective.

Study of Alper et al. (2014) showed that increase in reserve requirement ratios could affect banks' lending behavior and loan rates. In principle, banks, despite the increase in required reserve amount, can still compensate the decrease in the liquidity by borrowing from the Central bank. But the fact that the Central Bank's funding is for one-week period with a limited amount may expose banks to an additional interest rate risk that could increase deposit rate and cost of funding of banks. Thus, bank loans could decline due to increase in cost of funding and loan rates.

ii) Asymmetric Interest Rate Corridor

The CBRT, while implementing its monetary policy, uses various tools to affect market rates and liquidity. With these instruments, short-term (daily, weekly or one-month maturity) liquidity can be provided to the banks, as well as overnight borrowing from banks with excess funds. The spread between the CBRT's overnight lending and borrowing rates is defined as the “interest rate corridor”. As a requirement of the said operational structure, market rates are formed within the interest rate corridor. On the other hand, in the current structure, the one-week repo funding rate is called the “policy

rate”, since the CBRT provides funding mainly through one-week repo. The policy interest rate and the interest rate corridor are reviewed and announced weekly by Monetary Policy Committee. Many central banks that implement traditional inflation targeting use the interest rate corridor. However, in the traditional structure, the interest rate corridor is generally used to prevent market rates from deviating significantly from the policy rate, rather than being a tool on its own. In this respect, the interest rate corridor is defined as a narrow band that is symmetrical (generally unchanged) around the policy rate, in other words, it plays a passive role. On the other hand, in the system of the CBRT, the interest rate corridor is used as an active tool. Namely, the CBRT can adjust the width of the interest rate corridor when it deems necessary, while creating the corridor around the policy rate in an asymmetrical manner. In this designed structure, the interest rate corridor not only provides a faster and more flexible response to the volatility in short-term capital movements, but also can be used as an effective tool on loan growth when necessary. (CBRT, 2012).

In the framework implemented, the CBRT can use the uncertainty of the funding rate as a policy tool also. The degree of uncertainty depends on the width of the interest rate corridor and the predictability of the short-term interest rate. When an acceleration (slowdown) in loans is observed beyond the desired, the CBRT may cause a tightening (loosening) in loan supply, especially for institutions with liquidity deficit, by increasing (reducing) the uncertainty about the amount and cost of funding. In this system, interest rate volatility is significantly increased by widening the interest rate corridor downwards in periods when capital flows are strong, while exchange rate volatility can be reduced by widening the corridor upwards in periods when capital flows are weak. (Kara, 2012) In this way, it is aimed to limit the effects of speculative fund movements on exchange rate and credit growth. Accordingly, the asymmetric interest rate corridor is expected to contribute to financial stability.

iii) Reserve Option Mechanism

The reserve option mechanism is an application that allows banks to have a certain percentage of reserves at foreign currency or gold. The upper limits of this facility are called the Reserve Option Ratio (ROR). The coefficients that determine the foreign

currency or gold equivalent that can be established for each unit of Turkish lira required reserves are defined as the Reserve Option Coefficient (ROC).

Table 1 ROR and ROC for foreign currencies

ROR (%)	ROC (%)
0-40	1.4
40-45	1.7
45-50	2
50-55	2.2
55-60	2.3

Source: CBRT

Let's assume that the reserve option ratio is 50 percent, the reserve option coefficient is 1, and the USD/TRY exchange rate is 5. In this case, it is calculated that required reserves can be kept as $5000 \times \text{Reserve option coefficient} \times 1/\text{Foreign exchange rate}$ as 1000 USD for the maximum 5000 TL portion of 10000 TL. According to the reserve option ratios to be used by the banks, the reserve option coefficients may also change. For example, using the coefficients used when ROM was first implemented (Table 1) can be given as an example of the use of the ROM mechanism. In this case, banks' $\text{Total TL Liability} \times [0.4 \times 1.4 + 0.05 \times 1.7 + 0.05 \times 2.0 + 0.05 \times 2.2 + 0.05 \times 2.3] \times 1/\text{Foreign Exchange Rate}$ formula will give the foreign currency amount banks have to bring the within the framework of the ROM facility³.

ROM was created to increase the CBRT's gross reserves, to increase the flexibility of the banking system's liquidity management, to limit the effects of volatility in capital flows on financial stability, and to reduce the sensitivity of bank lending to capital flows. For financial stability and improving banks' liquidity flexibility, ROM is expected to serve in several ways. Banks are expected to adjust their foreign exchange reserves held at the Central bank according to external financing conditions. In the period of capital outflows, banks are expected to use ROM facility less and withdraw

³ For further details see Alper, K., Kara, H., & Yorukoglu, M. (2013). Reserve options mechanism.

foreign exchange reserves held at the CBRT as a foreign exchange liquidity. In addition, CBRT could change ROR and ROC in the period of capital outflows and manage foreign exchange liquidity of banks. In the periods of capital inflows and outflows, ROM is expected decrease effects of volatility in capital flows. Thus, ROM is expected to stabilizing effect which is main purpose of creation ROM by CBRT.

The CBRT has designed the ROM to basically use the ROM as an “auto-stabilizer” (in a way that banks will adjust their reserve option exercise rates internally in response to external shocks). The fact that this framework allows each bank to make the most appropriate choice in line with its own constraints makes the ROM more economically efficient than other tools used in foreign exchange rate (FX) liquidity management. However, when deemed necessary, the parameters of the system can also be used as a cyclical tool to adapt to permanent changes in internal and external financing conditions. (CBRT,2012)

In addition to its effect on liquidity management of the banking system, ROM is expected to increase foreign exchange reserves of CBRT and support financial stability. The increase in the share of the banking sector in gross reserves is expected to result in more effective use of reserves against short-term capital flows, which would increase the resilience and efficiency of the financial system. Since volatility in capital movements will adversely affect banks' debt repayment capacity and balance sheets, the increase in banks' share in reserves and the optimal use of this share according to the nature of shocks is expected to increase the economic efficiency of the system. (CBRT,2012)

According to the CBRT Report (2012), with the implementation of ROM, from the end of 2011 until the end of 2012, foreign exchange reserves for required reserves for Turkish Lira liabilities increased from US\$ 10.03 billion to US\$ 27.12 billion, while the gold reserves for Turkish Lira liabilities rose from US\$ 2.3 billion to US\$ 12.5 billion. The gross foreign exchange reserves increased by approximately 27 billion USD. Gross reserves reached US\$ 120 billion at the end of 2012 (Figure 3). CBRT's gross foreign exchange reserves increased with the reserve option mechanism. Since

the foreign exchange reserves and gold reserves held under the ROM are not purchased by the CBRT and belong to the banks, the facility does not affect the CBRT's net foreign exchange position and only increases its gross foreign exchange reserves.

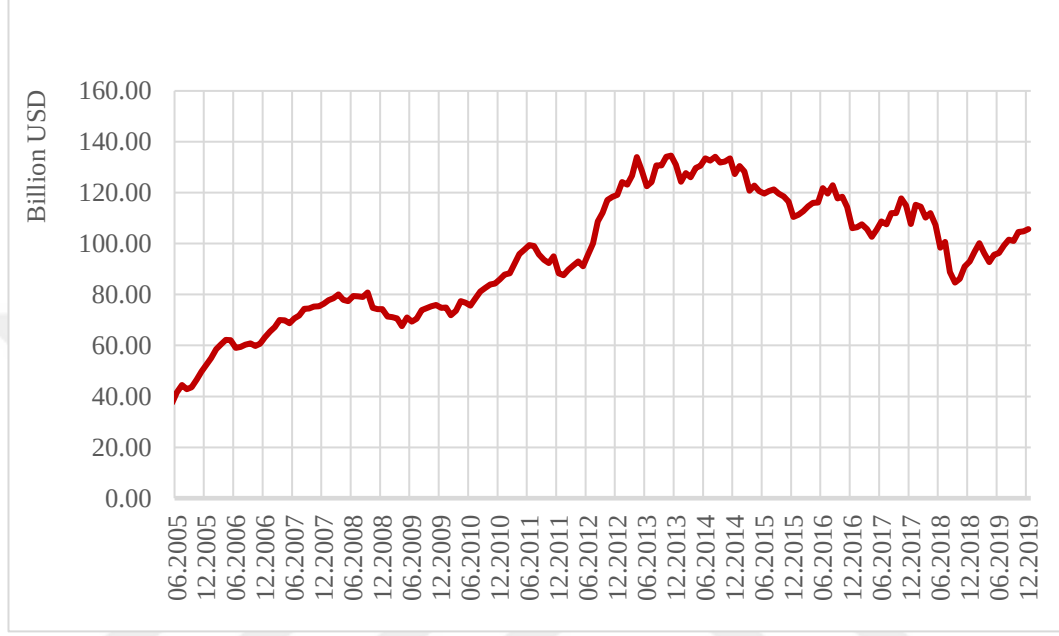


Figure 3 Gross Foreign Exchange Reserve of CBRT

Source: CBRT

ROM is also seen as a tool to curtail credit growth. Study of Küçüksaraç and Özel (2012) argues that ROM can be used as a countercyclical policy tool that can affect credit growth in both expansionary and contractionary ways. Thus, the sensitivity of loans to capital flows will be reduced.

As of 2010, the ROM mechanism was used to increase the CBRT's foreign exchange reserves, to support financial stability and to increase the flexibility of the banking system's liquidity management. The significant impact in this period was the contribution to the CBRT gross reserves. In the following years, the use of ROM as an active policy tool was terminated with the change in the global economic conjuncture.

2.2.2. Monetary Policy Framework

In the post-2010 period, due to high growth and increasing domestic loan demand, the central bank started to fund the banks. Therefore, this period differs from the pre-2010

period, when there was excess liquidity in the system and therefore the policy rate was the lower limit of the interest rate corridor. In this period, the CBRT funded banks with two main interest rates; the repo rate and the overnight lending rate, which is the upper limit of the interest rate corridor. Furthermore, in the post-2017 period, the CBRT started to use late liquidity window instead of the upper limit of the interest rate corridor (overnight lending rate). The repo rate was used as the policy rate of the Central Bank in the post-2010 period. By definition, repo is the Central Bank's temporary lending or providing liquidity to banks by purchasing bills, bonds and similar assets from banks under a repurchasing guarantee with a short maturity (usually 1 week). Even if the maturity of the repo is 1 week, repo auctions can be made daily. For example, in an environment where the lower limit of the interest rate corridor is 7% and the upper limit is 10%, the Central Bank will be able to fund repo from 8%. If the Central Bank meets all the needs of banks in this way, the interest rates used by banks when borrowing from each other will decrease to 8%. On the other hand, the Central Bank generally did not do this, and met only a part of the banks' needs through repo auctions. If the Central Bank makes 50% of the banks' funding with repo and 50% with 10%, which is the upper limit of the interest corridor (marginal funding), the average funding cost of the Central Bank will be 9%. Again, in this case, the interbank borrowing interest may be between 8% and 10%. (Ekşi and Ekşi, 2018)

Overnight market rates are at the level of the weekly repo rate when all funding is provided by weekly repo, but it can rise to the marginal funding rate under a tight liquidity policy. Therefore, using this policy the tightness of the monetary policy can be managed without changing the announced short-term interest rates. In this period while the monthly interest rates determined by the CBRT constituted the basic parameters of the monetary policy in the medium term, the funding composition and liquidity policy were also important in terms of the actual short-term policy stance. When the short-term interest rates and the funding composition were considered as a whole, the following two interest rates come to the fore in terms of the monetary policy stance: First, the CBRT average funding rate: This interest rate represents the weighted average interest rate of the short-term liquidity that the central bank gives to the market

through various channels. Since the funding provided by the CBRT constitutes an important part of the short-term funding provided by the banks, this interest rate may be important for banks in the pricing of deposits, loans and other financial instruments. Secondly, the Interbank money market overnight interest rate: It is the interest rate applicable to overnight transactions of banks and financial institutions in the Borsa Istanbul repo-reverse repo market. Although the level of the overnight market rate is not directly determined by the central bank, it can be largely controlled by the CBRT in interaction with the corridor parameters. In this framework overnight rate, which banks take as a basis when lending to each other, is of great importance in terms of monetary transmission mechanism, as it also serves as a reference for other short-term funding (such as swaps) that banks obtain from the money market. (Kara, 2015). In terms of the effectiveness of the monetary policy implemented by the CBRT, the interest rates in the Repo-Reverse Repo Market in Borsa Istanbul was expected to converge to the weighted average funding cost (Figure 4).

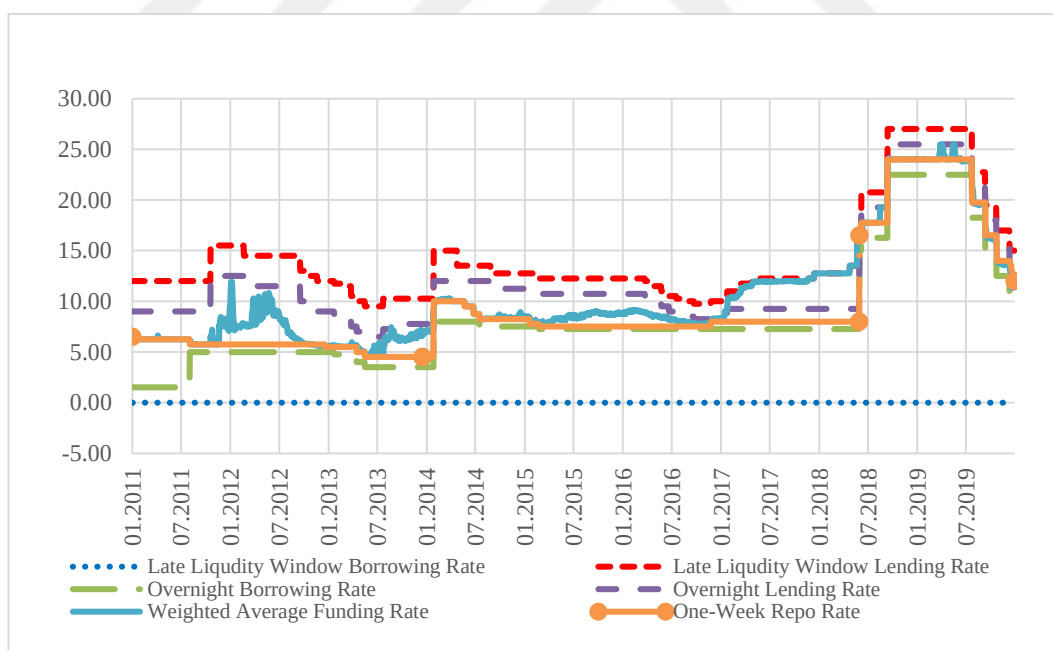


Figure 4 Interest Rates applied by CBRT for liquidity management (2011-2019)

Source: CBRT

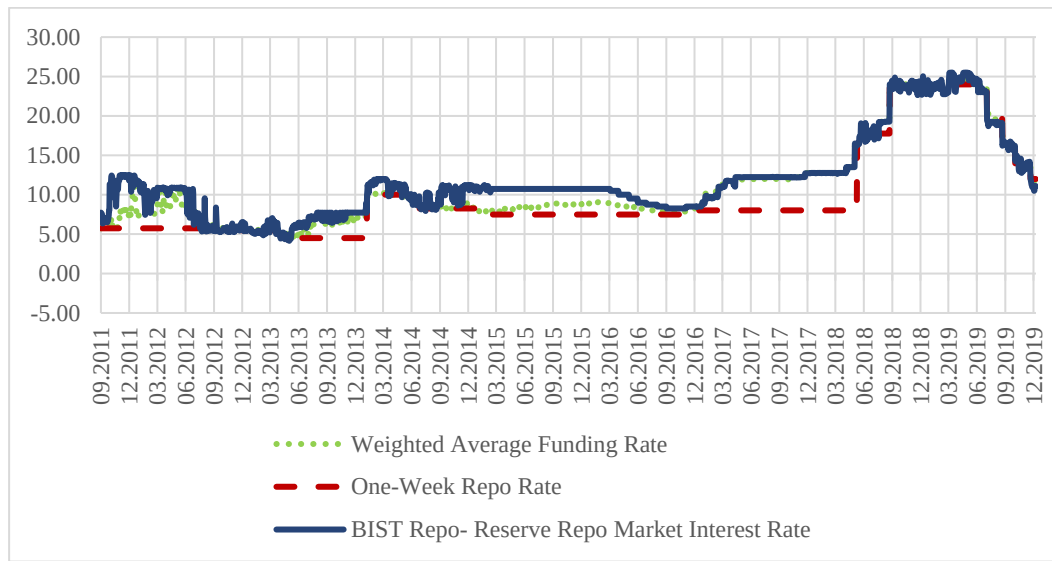


Figure 5 Interest Rate Corridor and BIST Repo-Reserve Repo Market Interest Rate

Source: CBRT

Pre-2010 period, when there was excess liquidity in the financial system and this liquidity was withdrawn from the market by the CBRT differs from the post 2010. In the post-2010 period, the Central Bank started to fund banks, and for this purpose, it started to use weekly repo transactions. Due to this change in funding, the one-week repo rate is called the policy rate of the Central Bank in the post-2010 period.

The USD/TRY exchange rate, that was around 1.50 at the beginning of May 2011, rose to 1.85 in October 2011. In the third quarter, the depreciation of the Turkish lira has exceeded 20 percent. Due to the depreciation of the Turkish lira, the base effect in unprocessed food prices, and the adjustments in managed/administered products, and increasing medium-term inflation expectations, the lending interest rate was increased from 9 % to 12 % at the MPC meeting on 20 October 2011. In order to achieve the desired goal, the one-week open market operations (OMO) funding amount made from the weekly repo rate was reduced, allowing banks to meet their funding needs from higher-cost sources within the expanded band. (CBRT,2011) As of 2011 (until 2017), a quantity limit was imposed on weekly repo auctions, in this case banks received some of the funding they needed from the upper limit of the interest rate corridor. Therefore, the average funding cost of the Central Bank's funding exceeded the weekly repo rate

in this period. In this case, the tightness of the monetary policy is changed without changing the policy rate. (Eksi and Eksi,2018)

Since the weighted average funding cost is, by definition, the weighted average of the repo rate and the upper limit of the interest rate corridor (with funding from these rates), it should be included in the interest rate corridor. The CBRT ended repo auction funding in 2017 and increased its funding amount from the upper band of the interest rate corridor.

In November 2017, the borrowing limits of banks in the Interbank Money Market operating under the CBRT were reduced to zero for overnight transactions, and all of the CBRT funding began to be provided from late liquidity window (GLP). In this case, the weighted average funding cost became equal to the late liquidity window upper limit. In addition, as of June, the simplification process in the operational framework of the monetary policy was completed. (CBRT,2018)

In the post-2008 crisis period, not only the weekly repo rate but various interest rates in the corridor were also used as the CBRT's policy rate periodically. In addition, asymmetric interest rate corridor was implemented to create a buffer against capital flows by way of interest rates uncertainty. In 2018, CBRT considered that the macro-economic conditions no longer need this unconventional framework and abolished these tools, and the policy rate was simplified. The CBRT's unconventional policies, such as the use of different interest rates, were sometimes criticized for its deteriorating effect to the its communication policy. These tools, used in the post-crisis period, were set aside to increase the communication effectiveness of the monetary policy after the changes in the economic conjuncture.

In June 2018, late liquidity window funding was replaced by weekly repo funding, and the funding composition was simplified. As of this date, the weighted average funding cost has converged to the one-week repo rate.

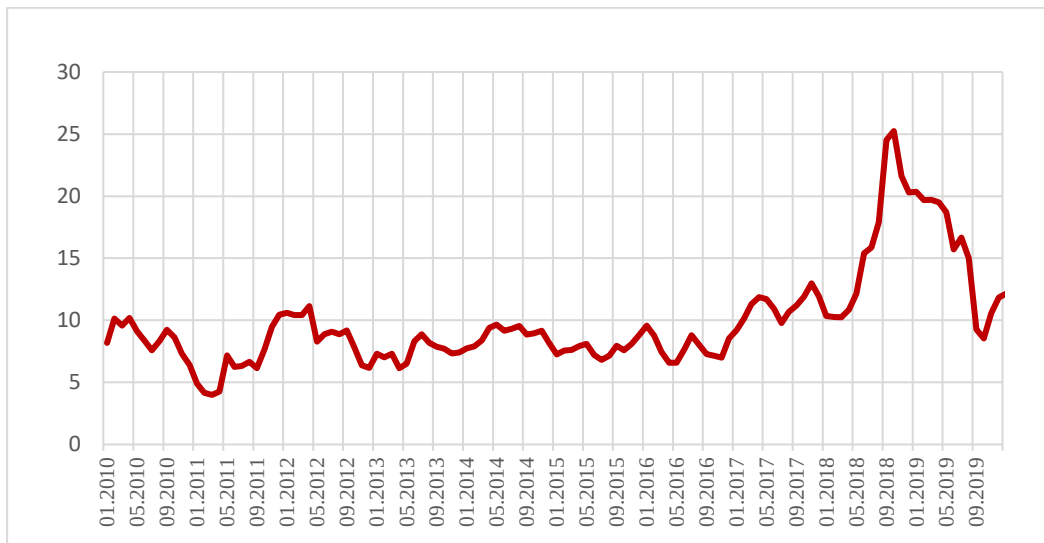


Figure 6 Annual Inflation Rate in Turkey (CPI, Annually, %)

Source: TURKSTAT

Since 2010, inflation has been around 10 percent on average, within the framework of the monetary policy that considers financial stability and inflation targeting together. Considering the year 2001, in which the transition to inflation targeting initiated, it is seen that inflation was reduced to single digits steadily, before it increased again in 2018 due to the developments in the exchange rate (Figure 6).

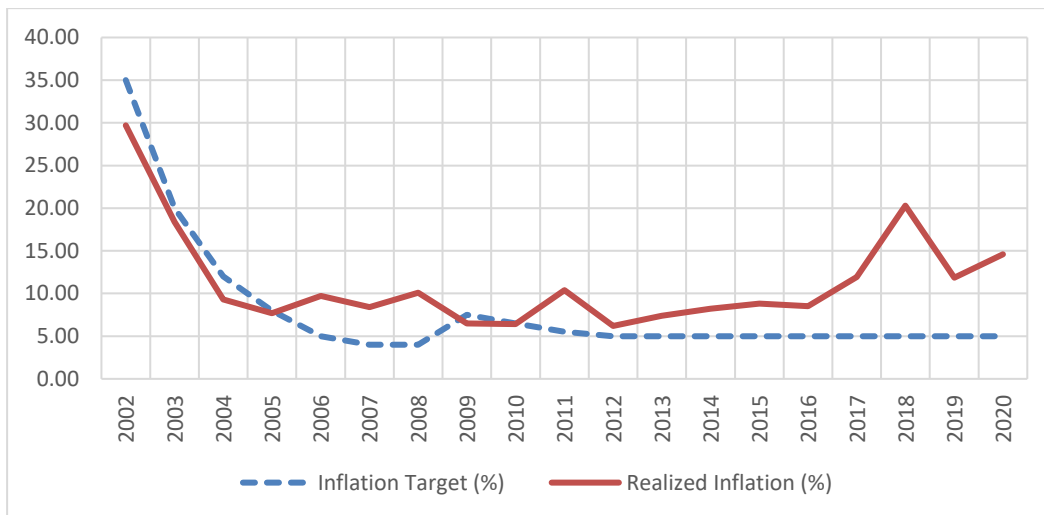


Figure 7 Inflation Target and Realized Inflation (CPI, Annually, %)

Source: CBRT

Looking at the performance of the inflation targeting regime since 2002, it is seen that the difference between the targeted inflation and the actual inflation in the first years of the implementation of the inflation targeting regime is less than the entire period. In particular, it is observed that inflation targets deviated from the realized inflation levels in the period after the 2008 global crisis. (Figure 7)

2.3 Summary

When the monetary policy framework implemented by the CBRT in Turkey is evaluated in general terms, the strategies that attach importance to monetary aggregates in the 1990s have been left to inflation-targeting strategies with fixed exchange rate-based programs together with the stabilization program that came into effect with the IMF in the 2000s. The fixed exchange rate regime could not be implemented successfully, and together with the crises experienced in 2001, the floating exchange rate regime was adopted. After the 2001 crisis, structural changes such as the amendments made to the CBRT Law were introduced, and the inflation targeting regime was adopted. The “implicit inflation targeting” regime was implemented between 2002 and 2005 due to the fact that the necessary fiscal discipline for the inflation targeting regime was not provided, the exchange rate was determinant in inflation and there were backward trends in pricing behavior. In 2006, interest was increased due to the decrease in risk appetite, and in 2008, interest rate cuts were made in order to prevent economic contraction due to fluctuations in financial markets. As of 2010, the CBRT, benefiting from the experience of the global financial crisis, moved to a new monetary policy framework that targets both inflation targeting and financial stability. In this period, required reserves, reserve option mechanism and interest rate corridor were used as an active policy tool. With the ROM, the CBRT's gross reserves were increased, and together with the asymmetric interest rate corridor, it was aimed to prevent movements that could adversely affect financial stability in exchange rate and credit growth depending on financial flows. Since 2017, the CBRT funding has been through the marginal funding channel, that is, through the late liquidity window. Looking at the development process of the inflation targeting regime since 2002, it is observed that inflation has downward trend for period of 2002-2010. In the post-crisis period, we see that the monetary policy framework became more complex with the

new instruments aimed at financial stability. In this period, inflation rate has departed from the inflation rate target because of effects of macroeconomic shocks and of volatility of capital flows.



CHAPTER 3

LITERATURE REVIEW

The theoretical background of the credit growth literature has a relation with the credit view, which examines the relationship between banks' lending behavior and the monetary policy. Credit view may be understood as a complementary mechanism for strengthening the explanatory power of traditional interest rate channel (money view), by focusing on the supply of loans. It works through market frictions such as imperfect information or costly enforcement of contracts in financial markets. According to the credit view perspective, as it is stated by Bernanke and Gertler (1995) size of the external premium (cost of external borrowing for firms) may change according to the effects of monetary policy and these changes could explain strength, timing, and composition of monetary policy better than the interest rate alone. Two mechanisms proposed under the credit view are: the balance sheet channel that works through its components such as net worth, liquid assets and cash flows of borrowers, and the bank lending channel focuses on loan supply of depository institutions. Under the condition of there is no perfect substitutability of retail deposit and other source of funds, monetary policy effects the loanable funds of banks and loan supply⁴. The literature on bank lending channel focus on how the monetary policy affects the loan supply and consistency of empirical results and theoretical expectations of banks' lending channel.

Adjacent to this perspective there exist an empirical literature that focus on determinants of credit growth. When the studies examining credit growth are examined, it is seen that some of the studies examine the sample of more than one country with panel data analysis, while some studies work on the sample of a single country. In addition, it is known that some studies deal with loan growth over loan demand and some on

⁴ For further discussions, see Bernanke and Blinder (1988), Bernanke and Blinder (1992), Bernanke and Gertler (1995), Kashyap, Stein and Wilcox (1992), Oliner and Rudebush (1996), Kashyap and Stein (2000), Kishan and Opiela (2000).

loan supply. In this sense, our study is methodologically closer to studies that include more supply-side approaches, taking the example of a single country.

These studies have different methodologies and models with various specifications. Explanatory variables of those models may consist of both internal factors such as bank-specific characteristics and external factors such as domestic and global macro-economic conditions. In this study, numerous studies in the literature are summarized in the following parts. Most of the studies focus on emerging market and frontier market countries. But also, there also studies focus on outside those countries. In the following parts, firstly, studies conducted panel data analysis using data from many countries are summarized. Secondly, studies focus on a single country are reviewed and lastly, studies specifically focus on Turkey are considered.

3.1 Multi-country studies

Guo and Stepanyan (2011) study credit growth in 38 emerging market economies including Turkey between the first quarter of 2002 and the second quarter of 2010. They use quarterly data series from International Monetary Fund (IMF) databases. Panel data estimation method is applied. Dependent variable is the growth rate of banking sector private credit and explanatory variables were foreign liabilities, domestic deposits, real GDP, inflation, deposit rate (as an indicator of monetary policy), exchange rate, US federal funds rate, US M2 and non- performing loan ratio. Domestic deposit is used as deposit growth and weighted by share of deposits in total credit four quarters ago. Foreign liabilities (Non-resident liabilities) is used as growth rate and weighted by total deposits of non-residents to total credit four quarters ago. Inflation is used as the control variable. Deposit rate is expected to measure monetary conditions in selected countries and US federal funds rate is used to represent global liquidity condition which is expected to have positive relation with credit growth in emerging market countries. In addition, alternative specifications are adopted to measure country-specific or period-specific characteristics. Empirical results of the first model adopted without specifications mentioned above showed that both domestic and foreign deposits have significant effect on credit growth with almost equal effect. It is considered

that banks treat different sources of funding equally. Inflation is seen to have positive effect on credit growth but having coefficient less than 1 showed that inflation means decrease in volume of real credit. GDP has positive relationship with credit growth while deposit rate has negative effect on credit growth as expected. US federal funds rate has a negative relation with credit growth in Emerging Market Economies (EME). Credit-to-GDP ratio does not have significant coefficient. NPL ratio is seen to have negative effect of credit growth as expected because healthy financial system is expected have more lending capacity. US M2 growth has positive relationship with credit growth in EMEs. Several policy recommendations are extracted for EMEs as follows; decreasing dependency on foreign liabilities could increase the stability of the financial system against external shocks. Increasing the capacity of domestic deposit base could be the key element for sustainable credit growth. Low level of inflation and strong economic growth are expected to increase credit growth. Lastly, health of banking sector is also key element for credit growth.

Pham (2015) uses data of 146 countries and examines determinants of credit growth in these countries between years 1990 and 2013. Transition economies and small countries are excluded from the study sample. Generalized method of moments (GMM) method is used for empirical analysis. Countries are grouped regarding income level to deal with the heterogeneity problem. Five different sub-samples are created such as full-sample, low-income countries, lower middle-income countries, middle-income countries, high-income countries. Explanatory variables of models are grouped under four categories such as internal demand factors, external supply factors, global factors, banking system factors. Internal demand factors are the ratio of total deposit to GDP, real lending interest rate, capital requirement ratio, dummy variable for systemic banking crisis, real GDP per capita, inflation rate, domestic money supply (ratio of M3 to GDP). External supply factors are the nominal exchange rate, foreign capital flows, financial integration level and trade openness level. Global factors are the change in money supply in US, change in FED funds rate, difference between domestic lending rate and US lending rate, external debt, dummy variable for systemic banking crisis. Banking sector factors are the return on equity (ROE) and return on asset (ROA) ratios,

bank concentration ratio in banking sector⁵, initial level of development in banking system and Non-Performing Loan (NPL) ratio. Empirical results⁶ indicate that real interest rate and money supply have positive effect on credit growth whereas regulatory capital, exchange rate, higher financial integration, difference in lending rate have negative effect. Result of study shows that health of banking system has significant role in credit growth boost. Contrary to the health of banking system, dependence on foreign capital inflows make economy vulnerable to external shocks and boom-bust cycles in the credit market.

Park et al. (2015) study credit growth in 26 European Union (EU) countries for the period of 2003-2014 with panel data analysis. Countries in EU are classified as advanced countries and emerging countries based on International Monetary Fund (IMF) classification. Bank credits are grouped regarding to loan maturity. Domestic deposits and foreign liabilities in banking sector, real GDP, deposit rate, overnight interbank interest rate of the Euro area (EONIA), trade openness and credit-to GDP ratio are used as explanatory variables. Several specifications are adopted by introducing time-specific dummies and country-level fixed effects. Various models are used for each credit type with different maturity levels. of bank credit, domestic deposit and foreign liabilities are used as growth rate compared to four quarters ago. Similar to Guo and Stepanyan (2011), deposit growth rate and foreign liabilities growth rate are weighted by ratio of deposits to total credit in four quarters ago and ratio of non-resident liabilities to total credit in four quarters ago respectively Deposit rate is expected to measure monetary condition while EONIA is expected to be indicator of global liquidity conditions. It is expected that trade openness has positive correlation with credit growth because increasing level of trade could increase the need of bank credit of firms. According to results of model covering all countries, both domestic deposits and foreign liabilities have positive effect on credit growth for all credit type with different level of maturity. Inflation has a positive effect on credit growth which is higher in short-term credit than other maturity levels. GDP growth does not have significant effect in the general model. Increase in deposit rate decreases credit growth because higher cost

⁵ For further details, see Beck et al. (2000).

⁶ Model 1 which includes all variable and full-sample.

of borrowing is expected to increase in interest rate of lending. EONIA has negative relation with credit growth contrary to deposit rate. Trade openness is found to increase in short-term and medium-term credit growth. Credit to GDP ratio, which used as indicator of financial deepness, shows that countries have deeper financial system has lower credit growth.

Oluitan (2013) studies determinants of credit growth in 33 African countries for period of 1970-2006. Panel data method of estimation is used for empirical analysis of the study. Credit growth is used as dependent variable and GDP, foreign inflow, volume of exports and volume of imports are used as explanatory variables. Empirical results show that credit growth is positively related with capital inflow, real import while real export has negative relation with credit growth.

Elekdag and Han (2012) studies on credit growth in emerging Asian countries for period of 1989- 2010 with quarterly data series. Structural Vector Auto regression (SVAR) model is applied. Two block approach to SVAR models is applied so shocks within blocks are defined with sign restrictions. Shocks between blocks identified with recursive Cholesky structure. Sample of study includes two blocks; one is weighted average of United States and Euro area and the other is emerging Asia (EMAS) countries such as; India, Korea, Singapore, Indonesia, China, Hong Kong SAR, Taiwan province of China, Philippines, Indonesia, Malaysia and Thailand. Quarterly data of real GDP, CPI, short-term interest rate, credit for EMAS countries are used in SVAR model. Study concludes that domestic factors in Asia such as monetary policy, have stronger effect than external factors such as global liquidity on credit growth. Financial stability is seen to decrease vulnerability to external factors in domestic credit dynamics. It is noted that greater exchange rate flexibility that could support financial stability so exchange rate flexibility could be an important element for domestic credit dynamics.

Tan (2012) examines credit growth in the Philippines and Asia for the period of 2002Q2 to 2010Q4 with the help of alternative empirical models. Model of Guo and Stepanyan (2011) is extended by Tan (2012) for Philippines and Asia. In this study,

explanatory variables of models as follows; inflation, growth rate of ratio of deposits to bank credit, growth rate of ratio foreign liabilities to credit, change in US Fed funds rate, real GDP growth rate. Some additional variables such as lagged value of real investment growth, real consumption growth, lagged value of distressed asset ratio (DAR), lagged value of net interest margins, lagged credit growth for Philippines and Asia case are also included. For Philippines, decomposition of credit growth regarding to the source of credit is considered reasonable because of low rate of investment growth in Philippines comparing to its peers. Thus, growth rates of investment and consumption in Philippines are included in model. Several models are adopted with different specifications. Results shows that inflation and real GDP growth does not have significant effect in benchmark model while real growth of consumption and real growth of investment have negative and positive effect respectively. DAR and Net interest margins have negative effect on credit growth as expected. Change in US Fed funds rate has negative effect on credit growth in Philippines and Asia. Deposit growth and foreign liability growth seemed to have positive effect on credit growth. Results of the study shows that US Fed funds rate and deposit growth, which are beyond the control of policymakers, are the most statistically significant factors.

Gozgor (2013) examines 24 emerging market economies including Turkey for period of 2000-2011. Monthly data series and panel data analysis are used. Ratio of total domestic credit to GDP is regressed on the ratio of total domestic credit to GDP with one lag, inflation rate with one lag, deposit rate with one lag, GDP per capita and nominal exchange rate. Also, country-specific control variables are included such as; ratio of money supply to GDP, ratio of US money supply to US GDP, ratio of NPL to total loans, ratio on net domestic incurrence to GDP, ratio on net foreign incurrence to GDP, spread between domestic lending interest rate and US lending interest rate, ratio of private capital flows to GDP are used without lag. Some control variables are included with one lag such as; ratio of current account balance to GDP, ratio of external balance on goods of services to GDP, nominal and real trade openness measures. Three dummy variables; spread between London Interbank Offered Rate (LIBOR) and Overnight Indexed Swap (OIS) rate, Chicago Board Options Exchange Volatility Index (VIX), Chicago Board Options Exchange SKEW Index are used to measure effect of

2008 global crisis. Empirical results show that loose monetary conditions, lending rate difference between domestic and global markets and real trade openness positively affects credit growth. External balance is seen to have negative relation with credit growth. GDP per capita and US money supply does not have significant effect. SKEW index has negative effect on credit growth while LIBOR-OIS spread, VIX index and dummy variable for 2009 are not statistically significant. Dynamic panel data estimation is repeated with cross-section OLS estimations and OLS estimations are seen to support panel data results.

3.2. Single-country studies

Ivanovic (2016) examines credit growth in Montenegro for period of 2004-2014. Quarterly data of 11 banks in Montenegro are used for panel data analysis. Credit growth is used as dependent variable of econometric model where GDP growth, inflation, deposit growth Euribor, GDP growth are used as explanatory variables with lag similar to study of Guo and Stepanyan (2011). Spread between interest rate of loans and deposits, deposit growth of banks, non-performing loans (NPL) ratio, solvency ratio (as a measure of capital strength of bank), inefficiency ratio which is a ratio of cost to income, return on equity (ROE) which represent banks profitability, are used as explanatory variables. Empirical results showed that GDP growth, deposit growth and solvency ratio positively increase credit growth whereas NPL ratio decreases credit growth. Other explanatory variables do not have statistically significant effect in the study. Time dummies are used in analyses to examine effect of global financial crisis and two sub-sample is used; one is pre-crisis and other one is post-crisis period. GDP growth is not statistically significant after 2008 crisis similar to solvency ratio. Deposit growth has positive effect in all periods while inefficiency ratio which effects negatively credit growth before crisis and positively after crisis. Lastly, it is seen that ROE has positive effect and NPL ratio has negative effect on credit growth after the crisis. It is observed that in post-crisis period only bank-specific variables effected credit growth.

Timsina (2017) studies credit growth in Nepal for the period 1975-2017 with Ordinary Least Squares (OLS) method. Dependent variable of study is growth rate of private credit and explanatory variables are growth rate of total deposits, growth rate of GDP, change in exchange rate, change in liquidity ratio of banks, change in inflation, change in reserve requirement ratio and change in one year saving interest rate. Empirical results show that increase in GDP increases credit growth as expected. Contrary to expectations, liquidity ratio showed negative effect on credit growth. Inflation and exchange rate do not have significant effect on credit growth.

Imran and Nishat (2013) study credit growth in Pakistan for the period of 1971 to 2010. Autoregressive distributive lag (ARDL) model is used to examine determinants of credit growth in Pakistan for both short-run and long-run. Foreign liabilities, domestic deposit, consumer prices index (CPI), real gross domestic product (GDP), exchange rate, money market rate, broad money (M2) are used as explanatory variables. According to empirical results, foreign liabilities, domestic deposit, economic growth, exchange rate and monetary conditions have significant and positive on effect credit issuance; however, money market rate and inflation does not affect credit growth in the long-run. Exchange rate is seen to have positive effect on credit growth and it is considered that valuation effect of foreign credit also has effect on credit in terms of domestic currency. Short-run model shows that domestic deposit and inflation does not have significant effect on credit growth. While exchange rate, broad money, money market rate, gross domestic product (GDP) have significant effects of credit growth. Strong economic conditions that are measured by GDP variable, have positive effect on credit growth in both short-run and long-run. Inflation and domestic deposits do not have significant effect in the short-run effect. It may show that bank does not issue loan immediately from domestic deposits. Money market rate is seen to have positive effect on credit in short run while it does not have significant effect in the long-run. The coefficient of error correction is -0.53 which shows that disequilibrium in short-run converges to long run equilibrium with %53 speed for each year.

Shijaku and Kalluci (2013) analyze credit growth in Albania for period of 2001Q1 to 2011Q4. In this study, vector error correction model (VECM) is used. Bank lending to

private sector as dependent variable and GDP, net wages in private sector, banking sector confidence, total deposits, ratio of total credit to total deposits, spread between lending interest rate and weighted average of deposits rate in domestic and foreign currencies, real effective exchange rate (REER), total stock of government debt and NPL ratio are used as explanatory variables of the model. Empirical results of the study showed that long-run cointegration relationship exists between the variables of the model. NPL ratio and government debt have negative effect on credit growth in the long-run while it is seen that exchange rate has positive effect. Net wages and interest rate spread have negative relation with private credit similar to exchange rate. Economic growth and deposit in banking sector are seen to support credit growth as expected.

Thaker (2013) examined Malaysian banking to see the effects of macroeconomic variables on credit growth for years between 1991 and 2011. Quarterly data and error correction model (ECM) is used. Log of bank credit is regressed to log of lending rate, consumer price index (CPI), and GDP. It is observed that there is long-run relationship between variables and all explanatory variables; lending rate, CPI and GDP positively effects the credit growth.

Dharmadasa (2021) examined credit growth in Sri Lanka for the period 2008-2019 with quarterly data series. ARDL method is adopted with bank-specific variables, macroeconomic variables and monetary policy variables. Bank-specific variables are the capital adequacy ratio (CAR), ROE ratio, efficiency ratio (EFI), and NPL ratio. Additionally, GDP growth and inflation as well as growth rate of money supply and commercial banks' lending rate are used as explanatory variables. Empirical results of the study showed that there exists a long-run relationship between variables. Long-run results considered that growth of money supply, NPL ratio, lending rate, inflation rate and efficiency ratio have a strong link with credit growth. Relationship between GDP growth and credit growth seemed to related with "demand following" hypothesis⁷. It is considered that bank-specific variables are not long-term determinants of credit

⁷ For further details see Robinson (1952).

growth. Credit growth in long-term mostly determined by macroeconomic and monetary policy variables mentioned above.

Assefa (2014) analyses credit growth in Ethiopia for the period 1978-2011. ARDL methodology is adopted and annually data series are used. Bank credit is regressed on domestic deposit in commercial banks, foreign liability in commercial banks, lending interest rate, reserve requirement, ratio of money supply (M2) to nominal GDP, real GDP and inflation (CPI). Empirical findings of the study show that long-term determinants of credit growth in Ethiopia are domestic deposits, foreign liabilities, lending interest rate, ratio of M2 to nominal GDP, inflation rate and real GDP. Domestic deposits, foreign liabilities, lending rate, inflation rate and GDP have positive effect on credit growth. On the contrary, ratio of M2 to GDP have negative effect. In the short-run, economic growth (GDP) and inflation variables do not affect credit growth. Foreign liability and lending interest rate are seen to have positive effect on credit growth in short-run whereas ratio of M2 to GDP has negative effect. Error correction model coefficient is estimated as -0.75. It indicates that there is quick adjustment process of disequilibrium to the long-run equilibrium. Dummy variable for banking sector reform in Ethiopia does not show significant effect to credit growth.

Oloyoko (2011) studies credit growth in Nigeria for the period of 1980-2005 by using a vector error correction model (VECM). Bank credit is regressed on deposits, investment portfolio, lending interest rate, reserve requirement ratio, liquidity ratio, exchange rate and nominal GDP. Results of study demonstrates that only the volume of deposits, investment portfolio, exchange rate and economic growth have significant effect on the credit growth with positive coefficients.

Akinlo et al. (2015) examines credit growth in Nigeria similar to Oloyoko (2011) for period of 1980-2010 using error correction model. Private sector credit used as dependent variable and explanatory variables of the model are money supply (M2), liquidity ratio, bank total asset, inflation, reserve ratio, cyclical risk premium, prime lending rate, exchange rate minimum rediscount ratio and real GDP. Credit Money supply, risk premium, bank total and inflation assets are found to have a positive effect

on credit growth while reserve ratio and lending rate have negative effect on credit growth in the long run.

3.3.Studies on Turkey

Temel Nalın and Taşdelen (2016) examines Turkish banking sector for years between 2005 and 2012 with monthly data series. Model of the study uses volume of total bank credit as dependent variable. Consumer credit interest rate, Industrial production index (IPI), Lending capacity of banking sector, Consumer price index, Non-performing loans (NPL), Income of Turkish central bank from interest rate payments and Rediscount credit are used as explanatory variables. Empirical results of study show that lending capacity of banking sector has positive relationship with credit growth while income of Turkish central bank from interest rate payments and rediscount credit has negative relation with credit growth. Increase in consumer credit interest rate has negative effect on credit growth. Inflation and NPL does not have significant effect on credit growth.

Bakır Yiğitbaş (2015) analyzes Turkish banking sector for period of 2003-2012. Monthly data series and ordinary least squares (OLS) method are used for econometric model. Private sector business loan is regressed to loan interest rates, industrial production index and real sector confidence index. Series of loan interest rates, industrial production index and real sector confidence index are used with one lag. Empirical results show that loan interest rate has negative relation and industrial production index has positive relation with effect with credit volume. It is observed that there is no statistically significant relationship between bank credit and real sector confidence index.

Sekmen and Topuz (2020) examine determinants of credit growth in Turkey for period of 2006-2019. Methodology of study adopted Toda and Yamamota (1995) and Hacker Hatemi-J (2006) causality tests. GDP growth rate, inflation rate, government debt, money supply (M2), Overnight lending interest rate of Central bank of Turkey (CBRT), FED funds rate, capital inflows, exchange rate, deposit and loan interest rates, ROA and ROE ratios of Turkish banks are used to explain credit growth. Empirical

results showed that GDP growth, monetary policy stance, inflation rate are key elements that drive credit growth. It is considered that monetary aggregates have weaker relation comparing to monetary policy interest rate. Likewise, credit growth is more sensitive to exchange rate and capital flow movements in comparison to FED funds rate.

When the studies on Turkey are evaluated, it is seen that the studies analyze the short-term effects of explanatory variables on credit. In these studies, it is seen that some macroeconomic variables similar to our study are used; economic activity, banking sector lending capacity and interest rates are also used to explain credit growth. Comparing to studies in Turkey, our study has a longer analysis period and analyzes the loan dynamics separately for short and long term for different loan types.

Table 2
Properties of selected studies in literature

Author	Period	Method	Country
Guo and Stepanyan (2011)	2002-2010	Panel Data Estimation	38 EM Countries including Turkey
Pham (2015)	1990-2013	GMM	146 Countries
Park et al. (2015)	2003-2014	Panel Data Estimation	26 EU Countries
Oluitan (2013)	1970-2006	Panel Data Estimation	33 African Countries
Elekdag and Han (2012)	1989-2010	SVAR	Emerging Asia Countries
Tan (2012)	2002-2010	Panel Data Estimation	Philippines and Asia
Gozgor (2013)	2000-2011	Panel Data Estimation	24 EM Countries including Turkey

Table 2 (continued)

Ivanovic (2016)	2004-2014	Panel Data Estimation	Montenegro
Timsina (2017)	1975-2017	OLS	Nepal
Imran and Nishat (2013)	1971-2010	ARDL	Pakistan
Shijaku and Kal-luci (2013)	2001-2011	VECM	Albania
Thaker (2013)	1991-2011	VECM	Malaysia
Dharmadasa (2021)	2008-2019	ARDL	Sri Lanka
Assefa (2014)	1978-2011	ARDL	Ethiopia
Oloyoko (2011)	1980-2005	VECM	Nigeria
Akinlo et al. (2015)	1980-2010	Error Correction Model	Nigeria
Temel Nalın and Taşdelen (2016)	2005-2012	OLS	Turkey
Bakır Yiğitbaş (2015)	2003-2012	OLS	Turkey
Sekmen and Topuz (2020)	2006-2019	Causality Tests	Turkey

CHAPTER 4

DATA AND METHODOLOGY

In this chapter, data and methodology used in this study are explained in the following two parts. In the first part, variables used to analyze total credit growth, corporate credit growth and consumer credit growth in Turkey for the study period (2005Q1-2019Q4) are explained. In the second part, the Autoregressive Distributive Lag (ARDL) methodology used to examine credit growth, in both short and long term, is summarized and the model used in this study is introduced. In this study, three models are adopted separately for each loan type to analyze the determinants of credit growth in short and long term.

4.1. Data

Variables used for this study are as follows; Total loans, corporate loans, consumer loans of the banking sector, total Turkish Lira deposits, total foreign currency deposits (FX deposits), policy rate (simple interest rate weighted average (overnight)), US Dollar/ Turkish Lira exchange rate, consumer price index (seasonally adjusted, 2003=100), GDP (seasonally and calendar adjusted chain linked volume index (2009=100)). Period selected is between 2005Q1-2019Q4. End of the period determined as 2019Q4 in order to exclude Covid ensued extraordinary policies and volatilities. Covid-19 pandemic forced policy-makers to support economic policies in several areas. Some of these are credit campaigns and liquidity support that are provided to real sector firms and banking sector. Thus, in this study the period corresponding to the extraordinary conditions of Covid-19 pandemic crisis is eliminated to better observe the long-run relations between variables. Consumer price index is seasonally adjusted by TRAMO-SEATS method using JDemetra 2.2.2 programme⁸. All variables

⁸ For further details on the TRAMO-SEATS method for seasonal adjustment, see Gomez and Maravall (1998).

in the empirical model are used in the logarithm form and monetary aggregates are normalized by the consumer price index.

Data sources are Banking Regulation and Supervision Agency (BRSA), Central Bank of Turkey (CBRT) and Turkish Statistical Institute (TURKSTAT). Variables are summarized in the table below. Variables in examining credit growth are chosen regarding the existing literature covered in Chapter 3.

As the policy rate indicator simple interest rate in interbank (weighted average) is used. Average funding rate of the CBRT does not exist for the period before 2011. Thus, simple interest rate in interbank (weighted average) is selected as it provides a continuous series similar to Karahan (2016). ARDL methodology is used to examine both short term and long-term relationship between variables. Three alternative models are adopted to examine the credit growth: in Models I, II and III total, corporate and consumer loans are used as dependent variables respectively. Monetary aggregates are taken from Banking Regulation and Supervision (BRSA). Loan data exclude credit card expenditures and corporate loans are calculated by subtracting consumer loans from total loans.

Except from policy rate and exchange rate, all variables are the last observation of each quarter while exchange rate and policy rate are the average value of all trading days in the last month of each quarter. GDP data is the seasonally and calendar adjusted index value taken from Turkish Statistical Institute.

Table 3
Variable Names, Definition and Data Source

Abbreviation	Definition	Frequency	Source
LogCredit	Total Loans in Banking Sector (in terms of Turkish Lira)	Quarterly	BRSA

Table 3 (continued)

LogCorporate	Total Corporate (in terms of Turkish Lira)	Quarterly	BRSA
LogConsumer	Total Consumer Loans (in terms of Turkish Lira)	Quarterly	BRSA
LogTL	Total Deposits denominated in Turkish Lira (in terms of Turkish Lira)	Quarterly	BRSA
LogFL	Total Deposits denominated in Foreign Currency (in terms of Turkish Lira)	Quarterly	BRSA
LogMmr	Simple Interest Rate in Inter-bank (Weighted Average, average of all trading days in last month of each quarter)	Quarterly	CBRT
LogCpi	Consumer Price Index (2003=100)	Quarterly	TURK-STAT
LogUsdtry	US Dollar / Turkish Lira Exchange Rate (Average of all trading days in last month of each quarter)	Quarterly	CBRT
LogGdp	Gross Domestic Product (Index 2009=100)	Quarterly	TURK-STAT

As it is stated in Table 2, the series are in a narrow band around their mean with small standard deviations. Logcorporate, Logconsumer, Logcorporate, Logmmr, Logtl have negative skewness that means they have long left tail, while Logcpi, Loggdp and Logfl have positive skewness and long right tail. It is shown that Logconsumer and Logmmr have kurtosis higher than 3 so that they distributed peaked while other series distributed flat relative to the normal. Jarque- Bera test and probability values shows that Logcredit, Logcorporote, Logcpi, Loggdp and Logfl distributes normally.

Table 4
Descriptive Statistics

	LOG CR- EDIT	LOG- COR- PO- RATE	LOG- CON- SU- MER	LOG -CPI	LOG -GDP	LOG -MMR	LOGTL	LOG -FL
Mean	8.03	7.76	6.56	5.35	4.85	2.21	7.67	7.21
Median	8.09	7.78	6.78	5.33	4.83	2.22	7.78	7.07
Maximum	8.74	8.55	7.11	6.08	5.18	3.13	7.98	7.99
Minimum	6.75	6.56	4.96	4.74	4.51	0.40	6.90	6.58
Std. Dev.	0.56	0.58	0.54	0.37	0.22	0.63	0.28	0.42
Skewness	-0.45	-0.27	-1.10	0.22	0.07	-0.94	-0.98	0.37
Kurtosis	2.05	1.84	3.43	2.09	1.55	3.99	2.88	1.82
Jarque- Bera	4.29	4.07	12.77	2.52	5.27	11.50	9.78	4.88
Probabil- ity	0.11	0.13	0.0016	0.28	0.07	0.0031	0.0075	0.08
Sum	481.85	465.78	394.12	321.39	291.17	132.80	460.28	432.74
SumSq. Dev.	19.11	20.07	17.48	8.17	2.86	23.52	4.74	10.88
Observa- tions	60	60	60	60	60	60	60	60

When Figure 1 is examined, it is observed that bank loans have historically had an upward trend during sample period. In the banking sector, it is observed that the share of corporate loans in the total loan stock is predominantly higher which is in the range of 70-80 percent historically. Therefore, it is expected that macroeconomic effects or legal regulations that affect corporate loans will have a greater impact on the credit market. When we look at the historical development, it is observed that consumer loans have been relatively less volatile than corporate loans. Total loans have decreased

sharply in the 3rd quarter of 2018 due to the developments in the financial markets, and this decline has been compensated in the ongoing process.

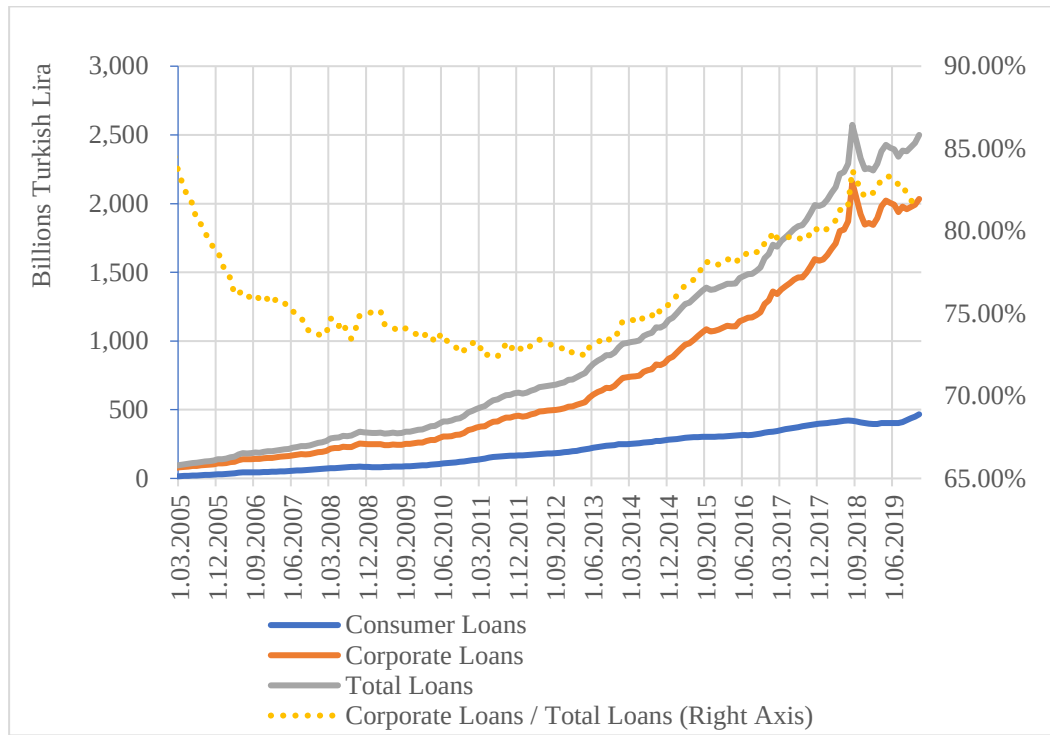


Figure 8 Development of Bank Loans

Souce: BRSA

Figure 2 shows the composition of bank loans; it is seen that approximately 30-40 percent of the loan volume is composed of foreign currency loans. In corporate loans, it is observed that the foreign currency loan ratio has historically deviated between 40 and 50 percent. Due to the legal regulations in the banking sector, the ratio of foreign currency loans in consumer loans is negligibly small. Considering these ratios, it can be expected that the local currency and foreign currency deposits which are source of banks loans will have different effects on different loan types.

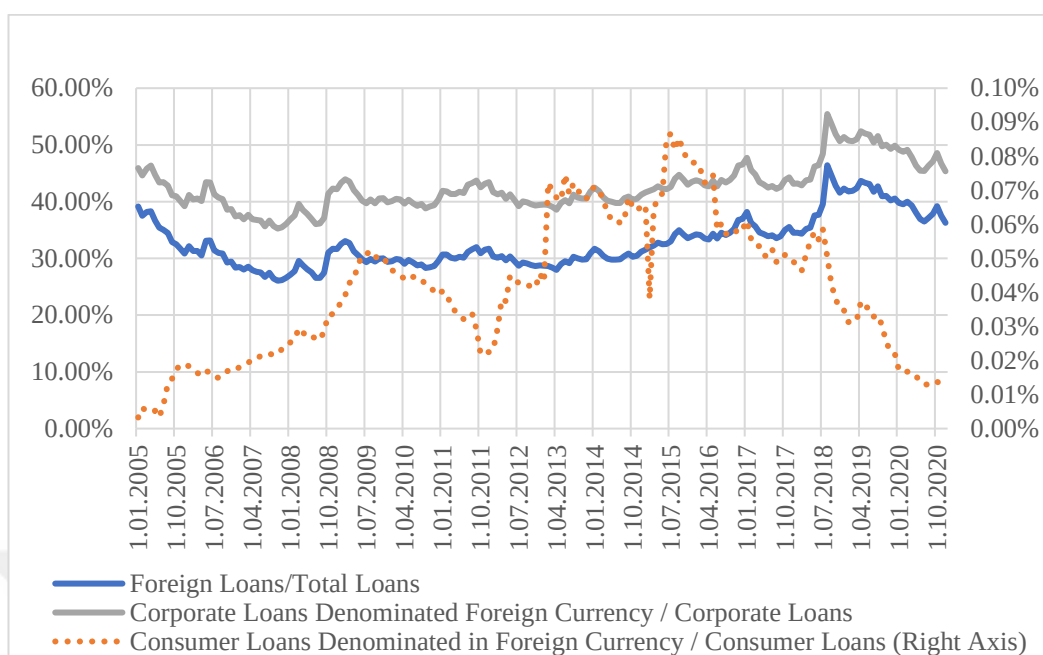


Figure 9 Composition of Bank Loans

Source: BRSA

Figure 3 represents the development of bank deposits during sample period. It is observed that the historical trend of total value of bank deposits is upwards. The share of foreign currency deposits in total deposits is between 30-50 percent. Because of the volatility in the financial markets, it is observed that the decrease in loan volume in the third quarter of 2018 also experienced in deposit. In this period, it is observed that the total deposit volume decreased due to the sharp decline in FX deposits (Foreign liabilities).

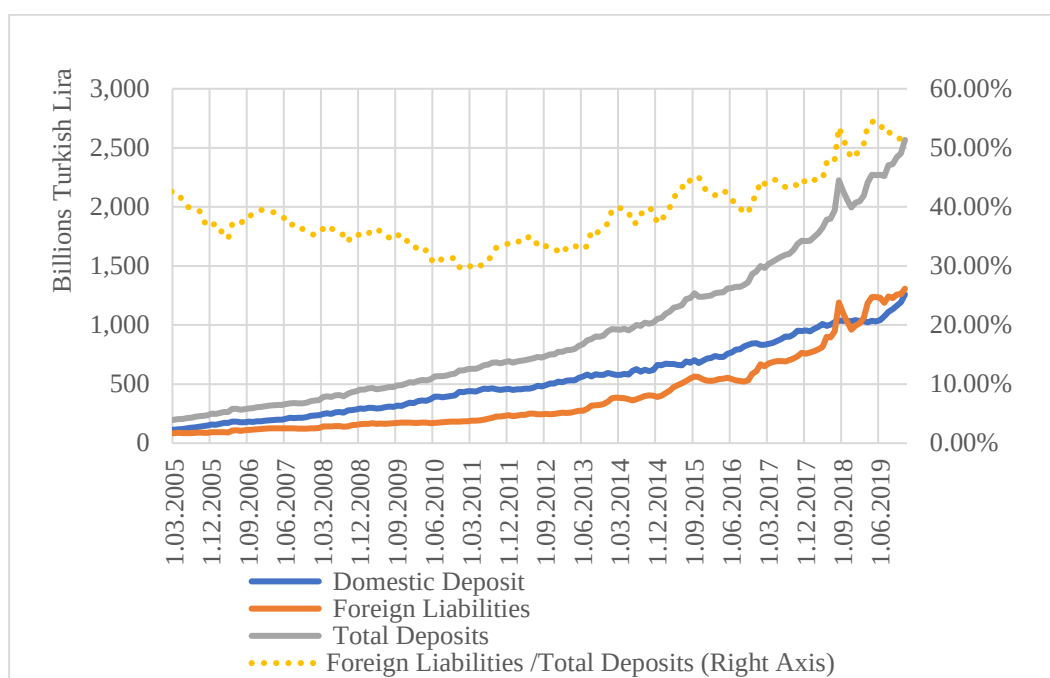


Figure 10 Development of Bank Deposits

Source: BRSA

It can be seen from Figure 4 that exchange rate (USDTRY) has upward trend after the global crisis, especially in the post-2008 period because of normalization policies taken by FED. In 2018, however, it showed a sharp upward trend due to the volatility in the financial markets. Beginning in the second quarter of 2018, CBRT overnight borrowing and overnight lending rates increased from 7.25 percent to 22.50 percent and from 9.25 percent to 25.50 percent, respectively, due to the sharp rise in the exchange rate. Depending on these developments, the Simple Interest Rate in Interbank, which was chosen as the policy rate in this study, jumped upwards.

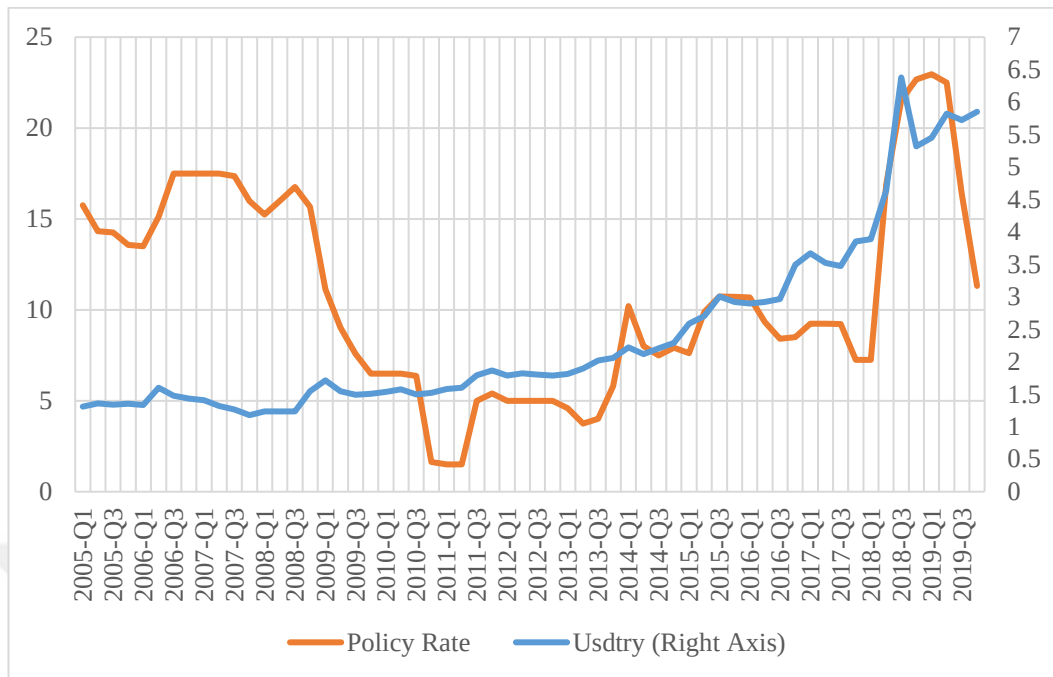


Figure 11 USDTRY Exchange Rate and Policy Rate

Source: CBRT

From Figure 5 it is observed that the growth of real GDP tends to be positive throughout the sample period of the study. Thus, GDP index, which represents economic activity, has an upward trend. It is shown that there is contraction in economic activity in the period between 2008 and 2009 due to the 2008 global crisis. In 2018, it is observed that the real GDP contracted due to the developments in the financial markets.

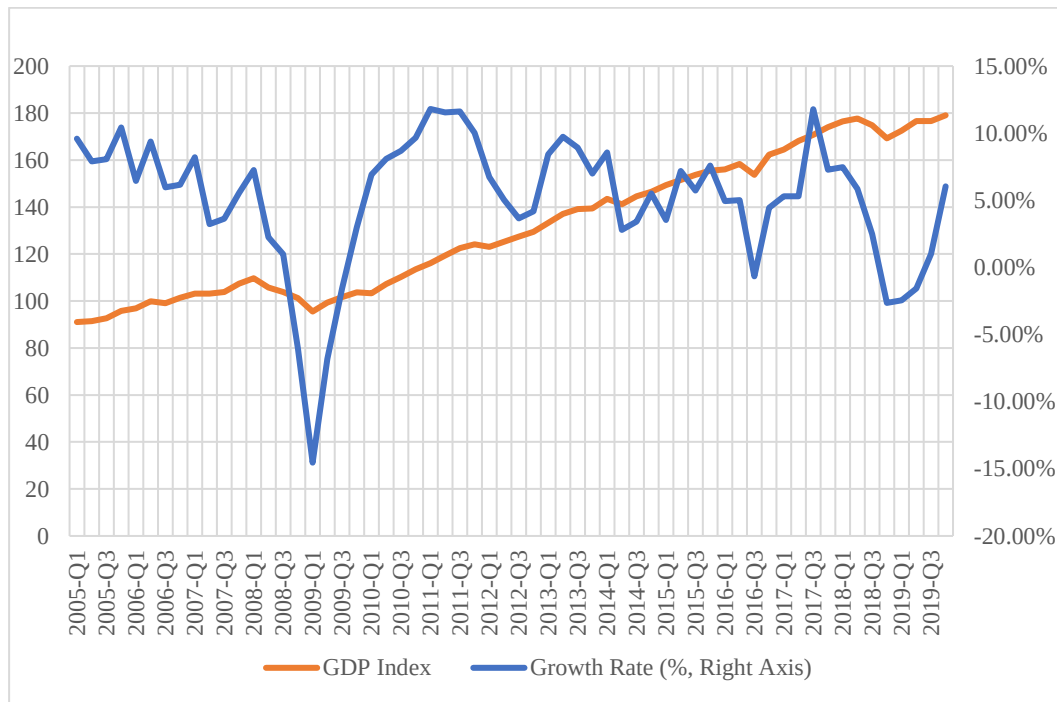


Figure 12 GDP Index and GDP Growth Rate (Annually, %)

Source: TURKSTAT

Figure 6 shows the inflation developments throughout sample period. It is seen that CPI series increased positively during all period and the series was seasonally adjusted due to the seasonality. In the period from 2005 to 2018, it is observed that the annual inflation rate deviates in a band between 5 and 10 percent, although it sometimes deviates out of the band. After 2018, the inflation rate increased to higher levels due to the developments in the financial markets. When the graphs of the series are analyzed, it is observed that the exchange rate and inflation jumped upwards due to the volatility in the financial markets in 2018, and CBRT rates increased in parallel with these developments.

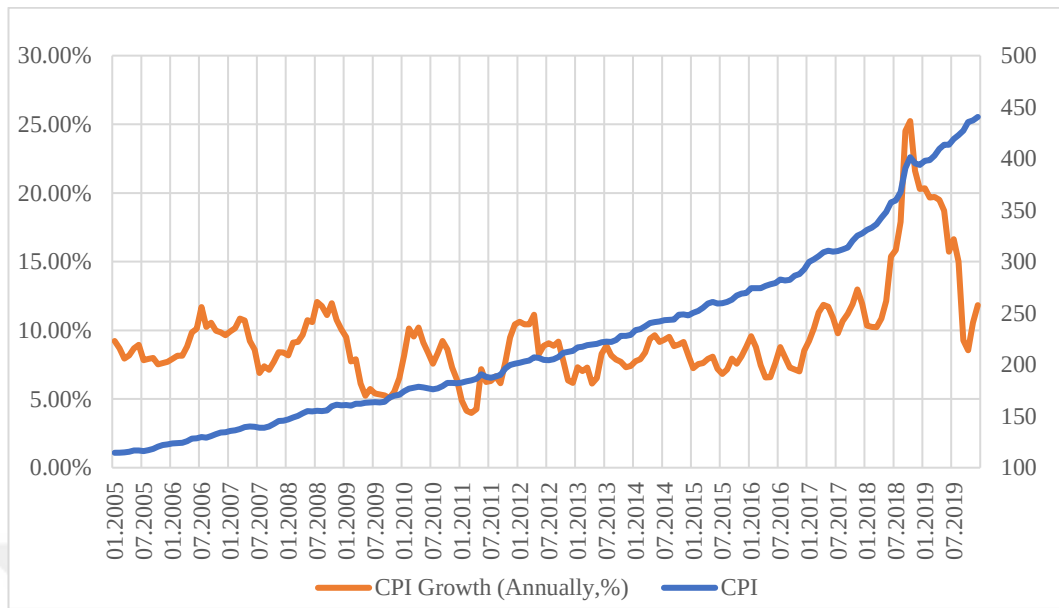


Figure 13 CPI and CPI Growth Rate (Annually, %)

Source: TURKSTAT

4.2. Methodology

In time series analysis, cointegration methods are applied to analyze long term relations between the variables. As a cointegration method, Autoregressive Distributive Lag (ARDL) cointegration approach and the Bounds test as the cointegration test developed by Paseran et al. (2001) is used to determine short- and long-term relationship between the variables in this study. Bounds test approach with ARDL uses ordinary least squares estimation (OLS) of conditional unrestricted model to check cointegration. With the help of this estimation, short-term and long-term coefficients of the variables are obtained.

It is preferable to other cointegration tests such as Engle-Granger (Engle & Granger, 1978) and Johansen Cointegration methods (Johansen (1988), Johansen & Juselius (1990)) because of the following advantages:

- ARDL approach with Bounds test can be applicable whether variables are integrated at level or at order one or fractionally cointegrated (Pesaran and Pesaran, 1997 as cited in Imran and Nishat, 2013).

- It has better results comparing to Engle and Granger (1987) and Johansen (1988, 1995) cointegration methods in small sample size. (Narayan, 2005).
- Long-term and short-term effects of variables could be estimated together.
- In ARDL models' variables could have different number of lags.

Estimation of ARDL approach is based on three phases. In the first phase, cointegration between variables is tested by using the bounds test. In the second phase, if cointegration exists ARDL model is built for long term coefficients. In the third phase, short-term coefficients are estimated by the error correction model. (Narayan & Smyth, 2006). In this study, we have three models for each credit type.

$$\text{LogCredit}_t = \beta_0 + \beta_1 \text{LogTL}_t + \beta_2 \text{LogFL}_t + \beta_3 \text{LogGdp}_t + \beta_4 \text{LogCpi}_t + \beta_5 \text{LogMmr}_t + \beta_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (1)$$

$$\text{LogCorporate}_t = \lambda_0 + \lambda_1 \text{LogTL}_t + \lambda_2 \text{LogFL}_t + \lambda_3 \text{LogGdp}_t + \lambda_4 \text{LogCpi}_t + \lambda_5 \text{LogMmr}_t + \lambda_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (2)$$

$$\text{LogConsumer}_t = \theta_0 + \theta_1 \text{LogTL}_t + \theta_2 \text{LogFL}_t + \theta_3 \text{LogGdp}_t + \theta_4 \text{LogCpi}_t + \theta_5 \text{LogMmr}_t + \theta_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (3)$$

Here, Logcredit refers bank loans in total, LogCorporate refers to corporate loans, Logconsumer refers to consumer loans, LogTL refers to deposits denominated in Turkish Lira, LogFL refers to deposits denominated in foreign currency, LogCpi refers to CPI, LogGdp refers to gross domestic product index, LogMmr refer to policy rate, LogUsdtry refers to USD/TRY exchange rate. All variables are in logarithm form.

When studies on loan growth are evaluated, it is expected that Turkish lira deposits and FX deposits have a positive effect on loan growth in the theoretical background. Similarly, the positive course of economic activity is expected to increase real credit growth. The policy rate, on the other hand, is expected to decrease loan growth due to the increase in loan costs. Depreciation domestic currency may have a positive effect on loan growth due to the increase in the value of foreign currency loans in total loans

(valuation effect), but it also could reduce the loan demand due to increased loan costs of foreign currency loans. Inflation rate may decrease the real loan growth because it is considered that credit rationing may be applied if the banks cannot reflect the increased finances of the banks due to the increase in inflation.

In the first step, equations (4), (5) and (6) are estimated to find the long run relationship. In these equations, and Δ sign refer to difference of related variable. Estimated F value of cointegration tests are used to determine existence of long-run relationships. For this, critical F values estimated by Pesaran et al. (2001) and Narayan (2005) are used. Narayan (2005) re-estimated F values of Pesaran et al. (2001) for small samples for more accurate estimation. Estimated F value should be higher than the upper-bound critical value for the existence of cointegration and null hypothesis should be rejected. If the estimated F value is lower than critical lower-bound value that means, there is no cointegration and if the estimated F value is between upper and lower bound values that means test result is inconclusive.

Bounds Test for LogCredit

$$\begin{aligned} \Delta \text{LogCredit}_t = & a_0 + \sum_{i=1}^p a_i \Delta \text{LogCredit}_{t-i} + \sum_{i=0}^p b_i \Delta \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p c_i \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p d_i \Delta \text{LogGdp}_{t-i} + \sum_{i=0}^p e_i \Delta \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p f_i \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p g_i \Delta \text{LogUsdtry}_{t-i} + \beta_1 \text{LogCredit}_{t-1} + \quad (4) \\ & \beta_2 \text{LogTL}_{t-1} + \beta_3 \text{LogFL}_{t-1} + \beta_4 \text{LogGdp}_{t-1} + \beta_5 \text{LogCpi}_{t-1} + \\ & \beta_6 \text{LogMmr}_{t-1} + \beta_7 \text{LogUsdtry}_{t-1} + \text{Errorterm}_t \end{aligned}$$

The null hypothesis is there is no cointegration between variables for equation number 1.

$$H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7$$

$$H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7$$

Bounds Test for LogCorporate

$$\begin{aligned}\Delta \text{LogCorporate}_t = & b_0 + \sum_{i=1}^p h_i \Delta \text{LogCorporate}_{t-i} + \sum_{i=0}^p j_i \Delta \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p k_i \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p l_i \Delta \text{LogGdp}_{t-i} + \sum_{i=0}^p m_i \Delta \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p n_i \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p r_i \Delta \text{LogUsdtry}_{t-i} + \lambda_1 \text{LogCorporate}_{t-1} + \quad (5) \\ & \lambda_2 \text{LogTL}_{t-1} + \lambda_3 \text{LogFL}_{t-1} + \lambda_4 \text{LogGdp}_{t-1} + \lambda_5 \text{LogCpi}_{t-1} + \\ & \lambda_6 \text{LogMmr}_{t-1} + \lambda_7 \text{LogUsdtry}_{t-1} + \text{Errorterm}_t\end{aligned}$$

The null hypothesis is there is no cointegration between variables for equation number 2.

$$H_0: \lambda_1 = \lambda_2 = \lambda_3 = \lambda_4 = \lambda_5 = \lambda_6 = \lambda_7 = 0$$

$$H_1: \lambda_1 \neq \lambda_2 \neq \lambda_3 \neq \lambda_4 \neq \lambda_5 \neq \lambda_6 \neq \lambda_7 \neq 0$$

Bounds Test for LogConsumer

$$\begin{aligned}\Delta \text{LogConsumer}_t = & d_0 + \sum_{i=1}^p s_i \Delta \text{LogConsumer}_{t-i} + \sum_{i=0}^p t_i \Delta \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p u_i \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p v_i \Delta \text{LogGdp}_{t-i} + \sum_{i=0}^p w_i \Delta \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p y_i \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p z_i \Delta \text{LogUsdtry}_{t-i} + \theta_1 \text{LogConsumer}_{t-1} + \quad (6) \\ & \theta_2 \text{LogTL}_{t-1} + \theta_3 \text{LogFL}_{t-1} + \theta_4 \text{LogGdp}_{t-1} + \theta_5 \text{LogCpi}_{t-1} + \\ & \theta_6 \text{LogMmr}_{t-1} + \theta_7 \text{LogUsdtry}_{t-1} + \text{Errorterm}_t\end{aligned}$$

The null hypothesis is there is no cointegration between variables for equation number 3.

$$H_0: \theta_1 = \theta_2 = \theta_3 = \theta_4 = \theta_5 = \theta_6 = \theta_7 = 0$$

$$H_1: \theta_1 \neq \theta_2 \neq \theta_3 \neq \theta_4 \neq \theta_5 \neq \theta_6 \neq \theta_7 \neq 0$$

If the null hypothesis is rejected for equations (4), (5) and (6), we will have two different equations for each loan type. One of these will show short-run dynamics of credit growth and the other will show long-run dynamics of credit growth. If cointegration exists, the long-run models presented in equations (7), (8) and (9) will be estimated.

Long-run Equations

For total loans the long-run equation is as below;

$$\begin{aligned} \text{LogCredit}_t = & a_1 + \sum_{i=1}^p a_{1i} \text{LogCredit}_{t-i} + \sum_{i=0}^p b_{1i} \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p c_{1i} \text{LogFL}_{t-i} + \sum_{i=0}^p d_{1i} \text{LogGdp}_{t-i} + \sum_{i=0}^p e_{1i} \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p f_{1i} \text{LogMmr}_{t-i} + \sum_{i=0}^p g_{1i} \text{LogUsdtry}_{t-i} + \text{Errorterm}_t \end{aligned} \quad (7)$$

For corporate loans the long-run equation is as below;

$$\begin{aligned} \text{LogCorporate}_t = & b_1 + \sum_{i=1}^p h_{1i} \text{LogCorporate}_{t-i} + \sum_{i=0}^p j_{1i} \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p k_{1i} \text{LogFL}_{t-i} + \sum_{i=0}^p l_{1i} \text{LogGdp}_{t-i} + \sum_{i=0}^p m_{1i} \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p n_{1i} \text{LogMmr}_{t-i} + \sum_{i=0}^p r_{1i} \text{LogUsdtry}_{t-i} + \text{Errorterm}_t \end{aligned} \quad (8)$$

For consumer loans the long-run equation is as below;

$$\begin{aligned} \text{LogConsumer}_t = & d_1 + \sum_{i=1}^p s_{1i} \text{LogConsumer}_{t-i} + \sum_{i=0}^p t_{1i} \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p u_{1i} \text{LogFL}_{t-i} + \sum_{i=0}^p v_{1i} \text{LogGdp}_{t-i} + \sum_{i=0}^p w_{1i} \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p y_{1i} \text{LogMmr}_{t-i} + \sum_{i=0}^p z_{1i} \text{LogUsdtry}_{t-i} + \text{Errorterm}_t \end{aligned} \quad (9)$$

Short-Run Equations of Models

For total loans short-run equation as below;

$$\begin{aligned}\Delta \text{LogCredit}_t = & a_2 + \sum_{i=1}^p a_{2i} \Delta \text{LogCredit}_{t-i} + \sum_{i=0}^p b_{2i} \Delta \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p c_{2i} \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p d_{2i} \Delta \text{LogGdp}_{t-i} + \sum_{i=0}^p e_{2i} \Delta \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p f_{2i} \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p g_{2i} \Delta \text{LogUsdtry}_{t-i} + \gamma \text{ECM}_{t-1} + \text{Errorterm}_t\end{aligned}\quad (10)$$

For corporate loans short-run equation as below;

$$\begin{aligned}\Delta \text{LogCorporate}_t = & b_2 + \sum_{i=1}^p h_{2i} \Delta \text{LogCorporate}_{t-i} + \\ & \sum_{i=0}^p j_{2i} \Delta \text{LogTL}_{t-i} + \sum_{i=0}^p k_{2i} \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p l_{2i} \Delta \text{LogGdp}_{t-i} + \\ & \sum_{i=0}^p m_{2i} \Delta \text{LogCpi}_{t-i} + \sum_{i=0}^p n_{2i} \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p r_{2i} \Delta \text{LogUsdtry}_{t-i} + \\ & \Omega \text{ECM}_{t-1} + \text{Errorterm}_t\end{aligned}\quad (11)$$

For consumer loans in banking sector short-run equation as below;

$$\begin{aligned}\Delta \text{LogConsumer}_t = & d_0 + \sum_{i=1}^p s_i \Delta \text{LogConsumer}_{t-i} + \sum_{i=0}^p t_i \Delta \text{LogTL}_{t-i} + \\ & \sum_{i=0}^p u_i \Delta \text{LogFL}_{t-i} + \sum_{i=0}^p v_i \Delta \text{LogGdp}_{t-i} + \sum_{i=0}^p w_i \Delta \text{LogCpi}_{t-i} + \\ & \sum_{i=0}^p y_i \Delta \text{LogMmr}_{t-i} + \sum_{i=0}^p z_i \Delta \text{LogUsdtry}_{t-i} + \eta \text{ECM}_{t-1} + \text{Errorterm}_t\end{aligned}\quad (12)$$

Also, for short-term dynamics Error correction model (ECM) version of ARDL will be performed for short-run effects where ECM_{t-1} refers to error correction term and coefficient ECM_{t-1} refers correction in disequilibrium. ECM_{t-1} is expected to be between -1 and 0.

CHAPTER 5

EMPRICAL RESULTS

In this chapter, empirical results of ARDL models for each credit type are examined in terms of economic and statistical perspectives. For the econometric analysis of all the empirical models Eviews 12 software is used. In the following sections, model dynamics and empirical findings for empirical models in the long-run and short-run are presented.

5.1 Unit Root Test

For deciding the estimation method, identification of the level of integration of variables is important. ARDL method will not be appropriate if data set includes variables that are integrated order of two. As Nkoro and Uko (2016) stated “ARDL cointegration technique is adopted irrespective of whether the underlying variables are $I(0)$, $I(1)$ or a combination of both, and cannot be applied when the underlying variables are integrated of order two.” Thus, bounds test is applied to check long-run relationship. There are several unit roots tests to determine the order of integration of variables. Augmented Dickey Fuller (ADF) and Philips-Perron (PP) tests are applied to test stationary of series. The unit root test results which are presented in Table 3 and 4 show that none of variables in the data set is $I(2)$ therefore, ARDL model could be estimated with these series below.

Table 5

Unit Root Test Results

	ADF			PP		
	Level	First Difference	Order of Integration	Level	First Difference	Order of Integration
LogCredit	-1.297	-6.052*	I(1)	-1.535	-6.032*	I(1)

Table 5 (Continued)

LogCorpo- rate	-0.670	-6.704*	I(1)	-1.077	-6.727*	I(1)
LogCon- sumer	-2.352	-4.022*	I(1)	-3.291	-3.805*	I(1)
LogTL	-2.776	-6.083*	I(1)	-2.737	-5.847*	I(1)
LogFL	-2.552	-8.909*	I(1)	-2.480	-10.437*	I(1)
LogGdp	-1.794	-6.732*	I(1)	-2.090	-6.729*	I(1)
LogCpi	0.058	-6.775*	I(1)	0.019	-6.737*	I(1)
LogUsdTry	-1.807	-6.724*	I(1)	-1.688	-9.137*	I(1)
*Refers that results indicates that there is no unit root. Tests includes intercept term and trend.						

Table 6**Unit Root Test Results**

	ADF			PP		
	Level	First Differ- ence	Order of In- tegration	Level	First Differ- ence	Order of Integra- tion
LogCredit	-4.7048*	-5.1275*	I(0)	-3.9122*	-5.0805*	I(0)
LogCorpo- rate	-3.9023*	-5.9799*	I(0)	-2.9794*	-6.0449*	I(0)
LogCon- sumer	-2.8683	-3.7814*	I(1)	-6.0522*	-3.6961*	I(0)
LogTL	-4.1746*	-5.6593	I(0)	-4.007*	-5.5896*	I(0)
LogFL	0.1418	-8.9294*	I(1)	0.82312	-9.8381*	I(1)
LogGdp	-0.4212	-6.7905*	I(1)	-0.44847	-6.7879*	I(1)
LogMmr	-1.9529	-6.2378*	I(1)	-1.97967	-6.2701*	I(1)
LogCpi	1.8814	-6.4806*	I(1)	1.9011	-6.4806*	I(1)
LogUsdTry	0.7094	-7.2281*	I(1)	1.42318	-7.7456*	I(1)
*Refers that results indicates that there is no unit root. Tests includes only intercept term.						

5.2 Model Selection

After detecting the order of integration, it is definite that ARDL models can be applied to variables mentioned. An important step in ARDL modelling is the estimation of optimum lag length for the variables of the model. Optimal lag lengths are selected

regarding to information criteria such as Akaike Information Criteria (AIC), Schwarz Information Criteria (SIC) and Hannan-Quinn Information Criteria (HQ). ARDL models are estimated for each loan type (Total loans, corporate loans, consumer loans) and optimum lag length of variables selected regarding to information criteria. As it is stated in Chapter 4 we have three models to analyze determinants of credit growth for each loan type. ARDL model specifies lags of each variable.

$$\text{LogCredit}_t = \beta_0 + \beta_1 \text{LogTL}_t + \beta_2 \text{LogFL}_t + \beta_3 \text{LogGdp}_t + \beta_4 \text{LogCpi}_t + \beta_5 \text{LogMmr}_t + \beta_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (13)$$

$$\text{LogCorporate}_t = \lambda_0 + \lambda_1 \text{LogTL}_t + \lambda_2 \text{LogFL}_t + \lambda_3 \text{LogGdp}_t + \lambda_4 \text{LogCpi}_t + \lambda_5 \text{LogMmr}_t + \lambda_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (14)$$

$$\text{LogConsumer}_t = \theta_0 + \theta_1 \text{LogTL}_t + \theta_2 \text{LogFL}_t + \theta_3 \text{LogGdp}_t + \theta_4 \text{LogCpi}_t + \theta_5 \text{LogMmr}_t + \theta_6 \text{LogUsdtry}_t + \text{Errorterm}_t \quad (15)$$

Firstly, for total loans model is estimated. Lag length is selected by Akaike Information Criteria (AIC). Optimal model for LogCredit is selected as (4,2,4,4,1,2,4).

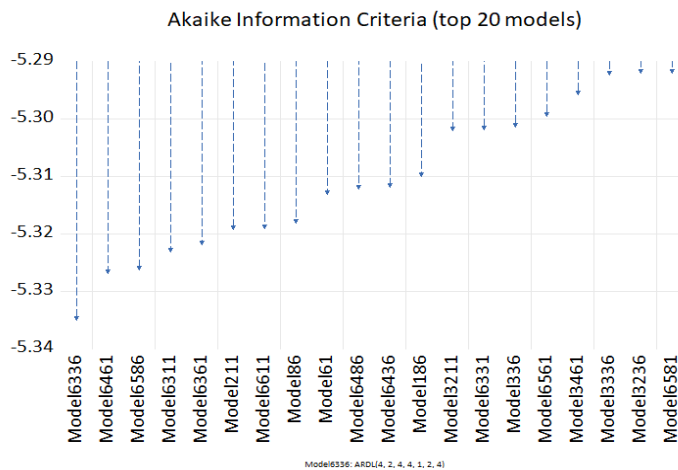


Figure 14
Model Selection for LogCredit

Secondly, for Corporate Loans model selection is done. Lag length is determined by AIC. According to AIC, best model for LogCorporate is (2,4,4,2,1,2,4).

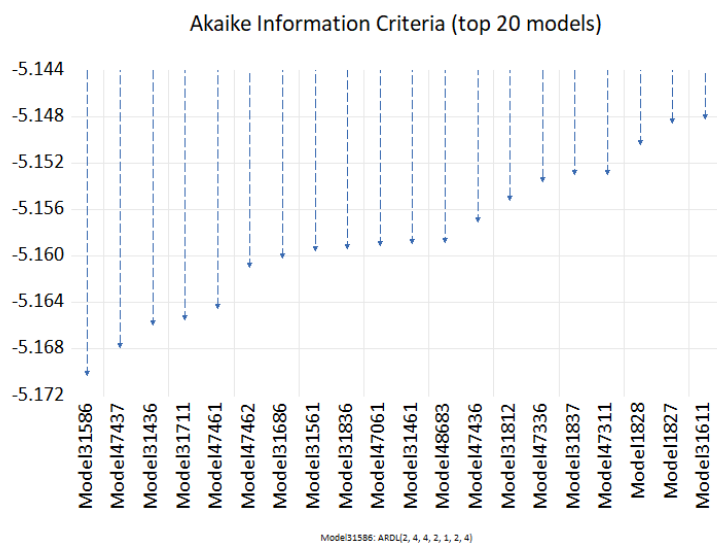


Figure 15
Model Selection for LogCorporate

For Consumer Loans model is estimated. Lag length selection is done by Hannan-Quinn (HQ) Criteria. According to HQ, best model for LogConsumer is (3,4,1,4,0,4,4).

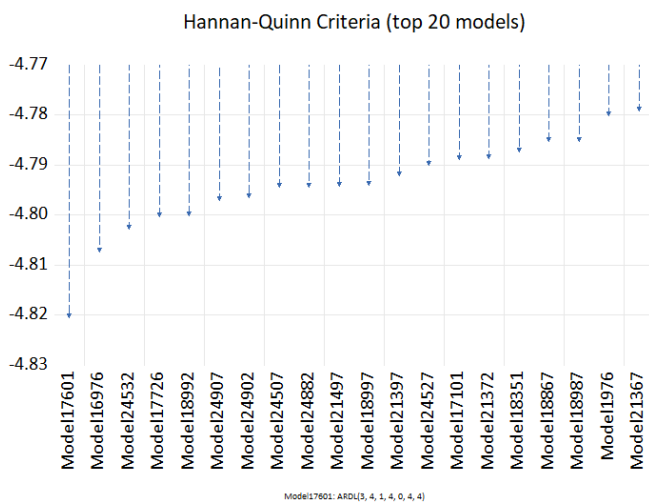


Figure 16
Model Selection for LogConsumer

5.3 Bounds Test and Long-Run Relationship

After model selection, Bounds test is applied to check for cointegration between the variables.

Table 7

Bounds Test Results

Model	Selected Model	F-Value
Model I (LogCredit)	(4,2,4,4,1,2,4)	6.319302
Model II (LogCorporate)	(2,4,4,2,1,2,4)	7.728348
Model II (LogConsumer)	(3,4,1,4,0,4,4)	9.14815
Level of Significance	Lower-Bound	Upper-Bound
%1	3.531	5.081
%5	2.643	3.932
%10	2.253	3.436

According to Bounds test results (Table 4), each model has a higher F-value than critical upper-bound value. Thus, cointegration is found for each model. Therefore, an error correction model can be fit for this data set. The next stage is the estimation of short-run and long-run models. In the following section results of these are presented and analyzed.

5.4 Results of Model I (Total Loans)

Model I analyzes the determinants of credit growth in total while in Models II and III loans are disaggregated into corporate and consumer loans. Before examination of coefficients of short-run and long-run equations, diagnostics test needs to be applied to ensure the statistical coherence of model results. Table 5 summarizes the results of diagnostic tests. As it is seen from table 5, Model I does not suffer from Autocorrelation, Heteroscedasticity or Instability.

Table 8**Diagnostic Test Results of Model I**

Test Name	Subject	Test Result
Ramsey Reset	Stability	1.043303 (0.3161)
Breusch-Godfrey LM	Autocorrelation	0.400464 (0.6741)
Breusch- Pagan- Godfrey	Heteroscedasticity	1.161956 (0.3474)
ARCH	Heteroscedasticity	0.835711 (0.3648)
Jarque-Bera	Normality	1.078546 (0.5831)
*Values in parenthesis refers to probability values.		

Table 6 summarizes long-run coefficients. Empirical results show that the policy rate and inflation does not affect real credit growth in the long run. GDP, deposits in domestic and foreign currencies are found significant and positive, which means that these will increase real credit as expected. Exchange rate is found significant and negative, which implies that a domestic currency depreciation will decrease real credits in total in the long-run.

Increase in domestic deposit is expected to increase credit volume as a result of increased lending capacity of banks. Table 6 shows that credit volume increases by %4,6 per % 10 increase in domestic deposit volume increase. Similar to domestic deposits, foreign currency deposits also have a positive effect on credit growth in the long-run. Empirical results show that %10 increase in foreign currency deposits increases total credit volume by %6.5. This finding supports the loanable funds theory.

Table 9**Long-run Coefficients of Model I**

Series Name	Coefficient	T-value	Probability
LogTL	0.46	3.717	0.00
LogFL	0.65	5.664	0.00
LogGdp	1.30	18.316	0.00
LogMmr	-0.03	-1.501	0.14
LogCpi	0.16	1.640	0.11
LogUsdtry	-0.51	-6.055	0.00

Economic growth is also expected to have positive relation with credit growth. Empirical results of study show that increase in GDP also increases real credit volume as expected. Results of this study supports “demand following hypothesis”. It is observed that %10 increase in real GDP increases total credit volume by %13.0. Interest rate (LogMmr) which refers to overnight borrowing rate in interbank market does not have long-run effect on the real credit volume. Ineffectiveness of policy rate on real loan may be resulted from use of alternative policy tools by CBRT.

Inflation rate does not seem to have significant effect on volume of real credit (Table 6). This may result from normalization of total credit by CPI. Effect of the exchange rate is measured by US Dollar/ Turkish lira. Table 6 shows that % 10 increase in Usd /Try (i.e. depreciation of Turkish Lira) decreases the real credit volume by % 5.1. Since the increase in the exchange rate will increase the cost of foreign currency loans, it is expected that the demand for foreign currency loans will decrease. It can be expected that depreciation of domestic currency will cause a decrease in the purchasing power in the long run and negatively affect the consumption propensity. Investment propensity also can be negatively affected due to inflation uncertainty caused by deprecation of domestic currency.

Table 10

Short-run Coefficients of Model I

Variable	Coefficient	T-Statistic	Probability
C	-5.388822**	-7.319705	0.0000
D(LOGCREDIT(-1))	0.215861	1.883822	0.0700
D(LOGCREDIT(-2))	-0.077505	-0.854236	0.4002
D(LOGCREDIT(-3))	-0.292575**	-2.992833	0.0057
D(LOGCPI)	-0.627430*	-2.670276	0.0125
D(LOGCPI(-1))	-0.674903**	-3.163515	0.0037
D(LOGFL)	0.247258**	4.240706	0.0002
D(LOGFL(-1))	-0.431741**	-5.767062	0.0000
D(LOGFL(-2))	-0.185244**	-3.661886	0.0010
D(LOGFL(-3))	-0.169801**	-3.153538	0.0038
D(LOGGDP)	0.521277**	4.444790	0.0001
D(LOGGDP(-1))	-0.260303	-2.012632	0.0539
D(LOGGDP(-2))	0.288872*	2.418773	0.0223
D(LOGGDP(-3))	0.176319	1.569299	0.1278

Table 10 (continued)

D(LOGMMR)	-0.007980	-0.933559	0.3585
D(LOGTL)	0.231204*	2.175176	0.0382
D(LOGTL(-1))	-0.479769**	-4.953932	0.0000
D(LOGUSDTRY)	0.060630	1.283471	0.2098
D(LOGUSDTRY(-1))	0.420538**	5.434097	0.0000
D(LOGUSDTRY(-2))	0.251647**	4.557181	0.0001
D(LOGUSDTRY(-3))	0.251057**	4.256820	0.0002
CointEq(-1)	-0.777215**	-7.328988	0.0000
*Refers statistically significant coefficients with probability of %5.			
** Refers statistically significant coefficients with probability of %1.			
R-Squared=0.925245			
Adjusted R-Squared=0.879068			

Estimation results of the short-run model are presented in Table 7. Domestic and foreign currency deposits seem to have positive effect on credit growth in the short run contemporaneously similar to the long run as it is shown in Table 7. However, lagged effects of both domestic and foreign currency deposits are negative. Therefore, in the short-run past expansions of liquidity (one quarter back for domestic currency deposits and 3 quarters back for foreign currency deposits) are found to have a negative effect on the current credit expansion in the short run. Interbank borrowing rate does not have significant effect in the short-run also. Exchange rate has positive effect on credit growth in the short-run as opposed the negative effect found in the long-run. Depreciation of this period does not have a significant effect but it has a lagged effect on credit growth in the short run. Exchange rate depreciation this period may increase inflationary expectations which could cause an increase in the current demand for durable goods, in return will increase the credit demand. Current and past inflation has negative effect on credit. Increase in inflation decreases purchasing power of economic agents. Lower purchasing power may decrease consumption and investment activities of these agents thus demand for credit could decrease. Increase in GDP seems to increase lending activity in the short-run similar to long run. Increase in GDP refers to an increase in purchasing power contrary to inflation, as well as an increase in economic activity. Thus, in the short-run GDP and inflation could have opposite effects on credit growth. Relation between credit growth and GDP could be bidirectional, they both could affect each other. In literature, some studies focus on lagged effect of GDP on credit growth and use lag value of GDP to deal with possible endogeneity problem

and some studies use ARDL model. In this study, ARDL model is adopted to deal with the endogeneity problem. Long run model shows positive effect of GDP on credit growth with ARDL methodology and avoids endogeneity. In the short-run model, lag value of GDP also shows positive effect of GDP on credit growth without endogeneity problem. Coefficient of error correction term is -0.77 which indicates that there is quick adjustment of short-run disequilibrium to long-run equilibrium.

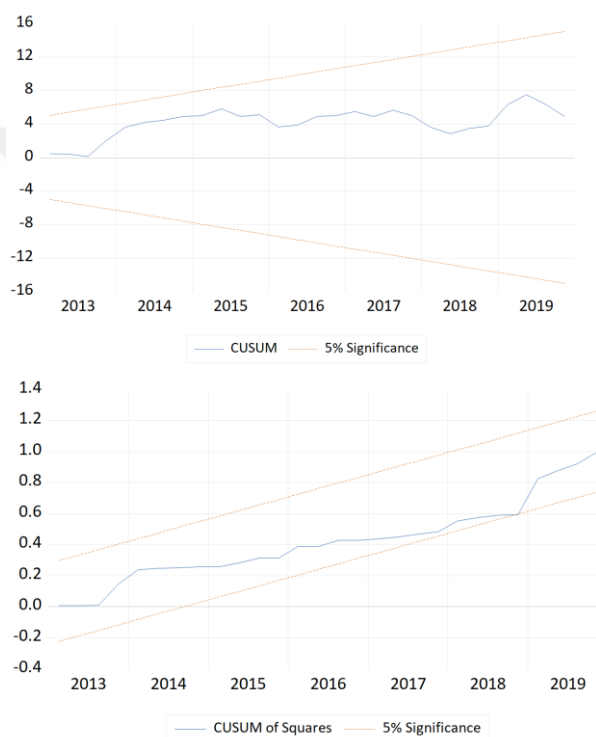


Figure 17
CUSUM and CUSUMQ Results of Model I

Cusum and CusumQ test results indicates that there is not instability problem in model.

Briefly, it is found that in the long-run economic growth not surprisingly, have a positive effect on credit growth both in the long-run and in the short-run. Domestic and foreign currency deposits positively affect the long run total credit growth. In the short-run the contemporaneous effect of deposit growth is positive but deposit growth of the past periods has a contractionary effect on credit volume. On the contrary, depreciation of domestic currency has a negative effect in the long-run but has a positive effect

in the short-run. This might be due to the fact that in the short-run its impact on inflationary expectations might trigger an intertemporal shift of expenditures from future to today. However, in the long-run domestic currency depreciation will increase the risks of the domestic economy and hence will lower the demand for credit. Inflation does not affect the credit growth in the long-run but in the short-run it will decrease the change in credits. The interbank borrowing rate (proxy for the policy rate) does not have a significant effect both in the short-run and in the long-run. This is due to the change in the CBRT policy strategy that take effect majority of the study period. As it is explained in Chapter 2 the CBRT started to use alternative policy tools after 2008 crisis.

It can be said that empirical findings of this study comply with studies in literature in general. Studies of Guo and Stepanyan (2011), Tan (2012) and Imran and Nishat (2013) shows that increase in domestic deposit increases credit growth. Similar to domestic deposits, foreign liabilities also increase bank lending in studies of Guo and Stepanyan (2011), Tan (2012), Imran and Nishat (2013) and Park et. all (2015). Increase in lending capacity is expected to increase banks' lending capacity. In literature, short-run results may be different from long-run results, for instance, Imran and Nishat (2013) finds that in the short-run domestic deposits do not have significant effect on credit growth.

In this study, economic growth is shown to have positive effect on real credit growth. Our finding on effect of GDP complies with general literature. Guo and Stepanyan (2011), Tan (2012), Imran and Nishat (2013), Park et al. (2015), Thaker (2013) for Malaysia, Ivanovic (2016) for Montegere, Timsina (2017) for Nepal and Chen and Wu (2014) for 24 EM countries including Turkey show positive effect of GDP on credit growth. In addition to long-run results, short-run results of this study show that increase in economic activity increases bank lending. Short-run model results of Imran and Nishat (2013) also shows that increase in GPD positively effects credit growth. Our results for interest rate show that there is no significant effect of interest rate on credit growth. In the literature, studies choose different interest rates such as money market rate or deposit rate. Some of studies argue that there is a negative effect of

interest rate on credit growth and some argues that there is not significant effect of interest rate. Imran and Nishat (2013) finds that in the long-run money market rate does not have significant effect on credit growth. Gozgor (2014) shows that decrease in real interest rate increases domestic credit for Turkey. Guo and Stepanyan (2011) shows that interest rate of deposit has negative effect on credit growth for EM countries including Turkey. Study of Bakır Yiğitbaş (2015) shows that loan interest rate has negative relationship with credit growth in Turkey. It can be evaluated that findings vary according to proxy for interest rate.

According to this study inflation does not have significant effect on credit growth; a result which complies with those of Imran and Nishat (2013), Gozgor (2013), Tan (2012), Ivanaovic (2016), Timsina (2017) and Temel Nalın and Taşdelen (2016). Our results for the short-run shows that inflation negatively affect real credit growth similar to the short-run findings of Dharmadasa (2021).

Our results show that depreciation of domestic currency has negative effect on credit growth. In the literature, findings about the effect of exchange rate vary. Guo and Stepanyan (2011), Imran and Nishat (2013) found that the exchange rate has a positive effect on loan volume and they stated that this may be due to the valuation effect of foreign loans. In this study, credit volumes are normalized by CPI in order to avoid exchange rate induced valuation effects. Decrease in credit volume in the long run may result from decreasing demand for corporate loans denominated in foreign currency and decrease in purchasing power. Result of the study complies with result of Pham (2015). On the other hand, Timsina (2017) finds that exchange rate does not have significant effect on credit growth and Oloyoko (2011) finds that exchange rate has positive effect on credit growth.

5.5 Results of Model II (Corporate Loans)

Model II is estimated to analyze the determinants of credit growth in corporate loans. Diagnostics tests given in Table 8 show that model does not suffer from autocorrelation, heteroscedasticity or instability.

Table 11**Diagnostic Test Results of Model II**

Test Name	Subject	Test Result
Ramsey Reset	Stability	0.094798 (0.7604)
Breusch-Godfrey LM	Autocorrelation	1.079061 (0.3536)
Breusch-Godfrey	Heteroskedasticity	1.193925 (0.3187)
ARCH	Heteroskedasticity	0.997364 (0.3225)
Jarque-Bera	Normality	0.495518 (0.7805)
*Values in parenthesis refers to probability values.		

Table 9 shows the estimated long-run coefficients. Long-run results for the corporate loans are similar to the Model I (Table 6) In the long-run policy rate and inflation does not affect real corporate credit growth. On the other hand, GDP, domestic and foreign currency deposits positively affect corporate credits and the exchange rate negatively affect corporate credit growth in long-run.

Table 12**Long-run Coefficients of Model II**

Series Name	Coefficient	T-value	Probability
LogTL	0.527582	4.147438	0.0003
LogFL	0.909192	6.582809	0.0000
LogGdp	1.223812	15.06727	0.0000
LogMmr	-0.036941	-1.651352	0.1091
LogCpi	-0.150522	-1.62088	0.1144
LogUsdtry	-0.405848	-4.730015	0.0000

Table 9 shows that increase in domestic deposit positively effects corporate credit growth. Comparing total credit, it is seen that %10 increase in domestic deposit increases corporate credit volume by %5.2 and total credit volume by %4.6. It is seen that these results also comply with the loanable funds theory that is increase in deposits increases banks' lending capacity. Foreign liabilities also have positive effect on cor-

porate credit growth (Table 9). It is seen that %10 increase in foreign liabilities increases corporate credit volume by %9.0 and total credit by %6.5. Corporate credit seems to have more sensitivity to movements in foreign liabilities relative total credit.

Increase in GDP also increases corporate credit. It can be expected that %10 increase in GDP increases corporate credit volume by %12.2. It may indicate that increase in economic activity improves expectations and encourages firms to invest more for more capacity. In addition, economic growth also contributes to lending capacity of banks as mentioned before. Increase in lending capacity of banks could also increase growth of corporate credit. Similar to total credit interbank market overnight borrowing interest rate does not have long-run on corporate credit. Results of model II indicates that long-run dynamics of firms' lending behavior are mostly macroeconomic conditions and banks loan supply capacity.

Inflation does not have significant effect on corporate credit similar to the total credit. Exchange rate has negative effect on corporate loans as it can be seen from Table 9. %10 Increase in GDP increases corporate credit volume by %4.05. As it is mentioned above the demand for corporate loans denominated in foreign currency may decrease due to depreciation of the domestic currency, because depreciation increases the risks for firms especially that have an open foreign currency position in their balance sheets. This could explain negative relationship between the exchange rate and corporate credit.

Table 13

Short-run Coefficients of Model II

Variable	Coefficient	T-Statistic	Probability
C	-5.121923**	-8.033177	0.0000
D(LOGCORPORATE(-1))	0.231089*	2.277300	0.0301
D(LOGCPI)	-0.200036	-0.903558	0.3734
D(LOGCPI(-1))	-0.075583	-0.349279	0.7293
D(LOGCPI(-2))	0.309511	1.475850	0.1504
D(LOGCPI(-3))	0.551870**	2.748138	0.0100
D(LOGFL)	0.353213**	5.626402	0.0000
D(LOGFL(-1))	-0.454801**	-5.782467	0.0000
D(LOGFL(-2))	-0.222694**	-4.085691	0.0003

Table 13 (continued)

D(LOGFL(-3))	-0.221266**	-3.711598	0.0008
D(LOGGDP)	0.457013**	3.690855	0.0009
D(LOGGDP(-1))	-0.230350	-1.625701	0.1145
D(LOGMMR)	-0.008975	-1.046357	0.3038
D(LOGTL)	0.421528**	4.401017	0.0001
D(LOGTL(-1))	-0.384467**	-4.174519	0.0002
D(LOGUSDTRY)	0.054020	1.132629	0.2663
D(LOGUSDTRY(-1))	0.268990**	3.762050	0.0007
D(LOGUSDTRY(-2))	0.174403**	3.122902	0.0039
D(LOGUSDTRY(-3))	0.132079**	2.421366	0.0217
CointEq(-1)	-0.676256**	-8.057178	0.0000
*Refers statistically significant coefficients with probability of %5.			
** Refers statistically significant coefficients with probability of %1.			
R-Squared=0.910224			
Adjusted R-Squared=0.862842			

Short run results of the corporate loans model are presented in Table 10. Accordingly, domestic and foreign deposits contemporaneously effect the corporate loan growth positively however past expansions of deposits have a negative effect in the short-run. Economic growth has a positive effect on corporate credit growth in the short-run similar to the long run. Increase in GDP could improve expectations and investment activities and therefore could trigger increased demand for corporate loans. Policy rate does not have a significant effect in the short-run as well as in the long-run. Inflation and exchange rate do not have contemporaneous affect in the short-run. However, inflation three quarters back stimulates current corporate loan growth.

Short-term positive inflation may reflect the positive course of economic activity as an indicator. Depending on the positive course of inflation, there may be increases in investment motivation and credit volume. In the short run, the positive effect of inflation on credit volume can be understood in this way. Domestic currency depreciation from past three quarters increases current corporate loan growth. Inflationary effect of depreciation of domestic currency is lagged; therefore, normalization of monetary aggregates may not compensate the valuation effect induced by depreciation of domestic currency in the short-run. Positive effect of depreciation of domestic currency may be resulted from valuation effect in the short-run. Coefficient of error correction term is -

0.67 which shows that short-run deviations adjust towards the long-run equilibrium rapidly.

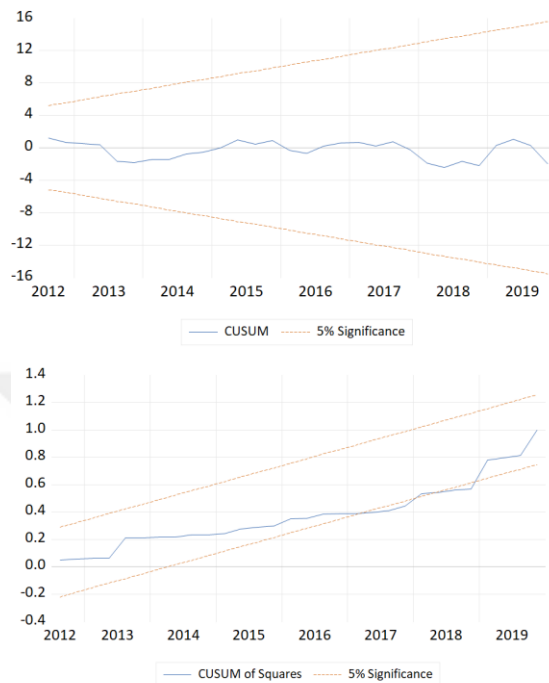


Figure 18
CUSUM and CUSUMQ Results of Model II

Cusum and CusumQ test results indicates that the estimated model is stable.

5.6 Interpretation of Model III (Consumer Loans)

Model III is estimated to analyze determinants of credit growth in consumer loans. Table 11 shows the results of diagnostic tests. As it is seen from Table 11, no evidence of autocorrelation, heteroscedasticity or instability are found for Model III as well.

Table 14
Diagnostic Test Results of Model III

Test Name	Subject	Test Result
Ramsey Reset	Stability	0.185913 (0.6696)
Breusch-Godfrey LM	Autocorrelation	1.729094 (0.1965)
Breusch-Pagan- Godfrey	Heteroskedasticity	0.827414 (0.6856)
ARCH	Heteroskedasticity	3.36E-05 (0.9954)
Jarque-Bera	Normality	8.146 (0.01719)

Table 12 shows the long-run coefficients of independent variables for consumer credit model. Similar to the other models, policy rate has no impact on consumer credit growth in the long-run. Additionally, domestic deposits, GDP and inflation have positive effect on consumer credit growth. Foreign currency deposits are only significant at 94% level and the coefficient is negative, this shows that the increase in foreign liabilities decreases the consumer credits. This effect is opposite of what is found for total credits and corporate credits. Exchange rate depreciation has a negative effect on consumer credit growth in the long-run similar to the other models. Another distinguishing finding of the long run model is that the positive effect of inflation on consumer credits in the long-run.

Table 15

Long-run Coefficients of Model III

Series Name	Coefficient	T-value	Probability
LogTL	0.802785	8.457148	0.0000
LogFL	-0.266901	-1.989059	0.0562
LogGdp	1.499532	14.26765	0.0000
LogMmr	0.028359	1.526795	0.1376
LogCpi	0.633407	5.384454	0.0000
LogUsdtry	-0.586001	-7.280910	0.0000

Domestic deposits seem to have positive effect on consumer credit growth similar to Model I and Model II. It can be evaluated that increase in domestic deposits increases lending capacity of banks for consumer loans. It seems that %10 increase in domestic deposits increases volume of real consumer loan by %8 and corporate loans by %5.2. Contrary to domestic deposits, foreign liabilities have the opposite effect on consumer loans. Deposits in foreign currency does not have statistically significant effect on consumer loans which are almost completely denominated in local currency. It can be interpreted that main source of consumer loans are domestic deposits.

Negative sign of foreign currency deposits may be evaluated to signal currency substitution (dollarization) and lack of trust for the domestic economy. Hence increased risks for the domestic economy could lower consumer credit which seems relatively more sensitive to risk perception. Thus, result of model III for inflation is not similar to corporate and total loans as well. In this case inflation triggers more consumer loans in the long-run where corporate loans and total loans are not sensitive to inflation in the long run. As it is stated in chapter 4, very small portion of consumer loans is denominated in foreign currency. This implies that supply of consumer loans is more dependent on domestic deposits and funding of consumer loans is mostly sourced from domestic deposits. Our finding supports that consumer loans are more sensitive to domestic deposits than the corporate loans (Table 13).

Increase in GDP has positive effect on consumer loans similar to results of Model I and Model II. Results of Model III complies with literature and expectations. It may be argued that economic growth increases mortgages and consumption of durable goods including automobiles and more consumer loans are supplied as a result.

As it is shown in Table 12 interest rate does not have long-run effects on consumer loans. Results of Model III complies with results of Model I and Model II. It can be evaluated that long-run dynamics of credit markets are not related with the policy rate. Inflation has a positive effect on consumer loan growth contrary to corporate and total loans. It could be evaluated that inflation expectations of individuals affect consumer borrowing behavior which in turn could increase mortgages and auto loans in the long-run.

Exchange rate seems to have negative effect on consumer credit growth in the long-run similar to Model I and Model II. It seems that for both consumer loans and corporate loans depreciation in domestic currency decreases the volume of real credit. Depreciation of domestic currency may restrict banks' balance sheet in terms of legal regulation such as capital adequacy ratios.

Table 16

Short-run Coefficients of Model III

Variable	Coefficient	T-Statistic	Probability
C	-4.384748**	-8.820169	0.0000
D(LOGCONSUMER(-1))	0.101006	0.935572	0.3572

Table 16 (continued)

D(LOGCONSUMER(-2))	-0.289373**	-3.368598	0.0021
D(LOGCPI)	-0.796373**	-3.159949	0.0037
D(LOGCPI(-1))	-1.483335**	-5.668041	0.0000
D(LOGCPI(-2))	-1.022028**	-3.557619	0.0013
D(LOGCPI(-3))	-0.618325*	-2.634046	0.0134
D(LOGFL)	0.007912	0.120410	0.9050
D(LOGGDP)	0.630773**	4.928864	0.0000
D(LOGGDP(-1))	0.051433	0.401522	0.6910
D(LOGGDP(-2))	0.628404**	4.890481	0.0000
D(LOGGDP(-3))	0.226698	1.865442	0.0723
D(LOGTL)	0.432679**	4.301358	0.0002
D(LOGTL(-1))	-0.278131*	-2.657171	0.0127
D(LOGTL(-2))	-0.069594	-0.710165	0.4833
D(LOGTL(-3))	-0.271599**	-2.964753	0.0060
D(LOGUSDTRY)	-0.069728	-1.324042	0.1958
D(LOGUSDTRY(-1))	0.354953**	6.168570	0.0000
D(LOGUSDTRY(-2))	0.254760**	4.768304	0.0000
D(LOGUSDTRY(-3))	0.121911**	2.934720	0.0065
CointEq(-1)	-0.564526**	-8.791234	0.0000
*Refers statistically significant coefficients with probability of %5.			
** Refers statistically significant coefficients with probability of %1.			
R-Squared=0.943150			
Adjusted R-Squared=0.910665			

Short run results of Model III are presented in Table 13. According to these increase in GDP two quarters ago affects current consumer loans positively. Domestic deposits have positive effect on consumer credit growth contemporaneously, however past deposit expansions lower current credit. This dynamic impact of past liquidity expansions is similar to the other models. Foreign currency deposits on the other hand don't have an impact on the consumer loans in the short-run. Current exchange rate depreciation does not have a significant short-run effect. However, depreciations from the previous quarters causes consumer loans to increase. Inflation seems to have positive effect on consumer credit contrary to its long-run results. This may indicate that short-run and long borrowing dynamics of individuals differ. Interesting point of Model III is that there is a positive effect of inflation on consumer loans contrary to corporate loans in the long run and a negative effect in short-run. The composition of consumer loans is known that it consists of mortgages, vehicle and personal loans. Short run and long run different effects of inflation and exchange rate could be due to intertemporal

shift of expenditures. When the different effects of the exchange rate in the short term and in the long term are analyzed, it can be evaluated that the upward movement in the exchange rate increases consumer loans in the short term by shifting the consumption from future to today and in the long term it affects consumption propensity negatively with the contraction in purchasing power. Similarly, the effect of inflation on consumer loan varies depending on the term. In the short term, inflation negatively effects the consumer loans, however, in the long-term its effect is positive. It could be interpreted that in the short-run increase in inflation postpones the consumption behavior from today to future, and in the long-run inflationary environment encourages consumers to borrow. Finally, policy rate does not affect short-run consumer credit growth.

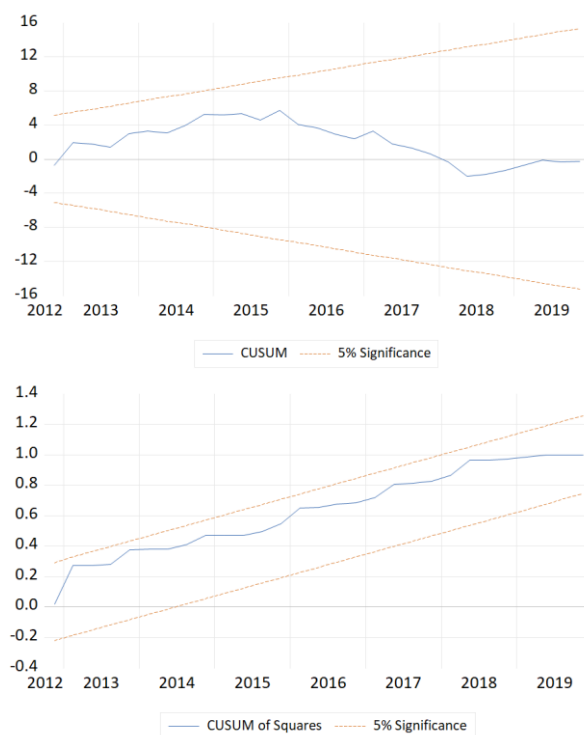


Figure 19
CUSUM and CUSUMQ Results of Model III

Cusum and CusumQ test results indicates that the estimated model is stable. Results of Model III complies with results of Model I and Model II in general

5.7 Overview on Bank Loans

When the dynamics of loan growth are compared between each other, it is seen that the increase in domestic currency deposits increases loan growth in each model. On the other hand, foreign currency deposits have a positive effect on the growth of corporate loans, while the effect on consumer loans is statistically insignificant. It is found that foreign currency deposits are an important source of funds for corporate loans. Because significant portion of corporate loans is in foreign currency, the increase in FX deposits increases the volume of corporate loans by providing funds for foreign currency loans. Since almost all of the consumer loans are in domestic currency, effect of foreign currency deposits is found to be statistically insignificant. Most of the studies show that the increase in the deposit volume has a positive effect on the loan volume due to increase in banks' lending capacity. It is observed that the positive course of economic activity increased the loan volume. Corporate loans increase as a result of the positive course of economic activity that has a positive effect on the investment propensity. It is found that positive course of economic activity to increase consumption propensity and consumer loans. Literature in general evaluates that increase in GDP and banks' lending capacity increases the loan volume and our estimation results are in line with the literature. It is seen that the policy rate is statistically insignificant for both loan types. Our estimation results show that inflation has significant effect (positive) for only consumer loans. It is found that the increase in inflation increases the consumer loan volume by shaping inflation expectations in the long run and decreases the consumer loans by affecting the spending and borrowing behaviors in the short run. It is observed that the depreciation of domestic currency decreases banks' lending. Foreign currency loans, which constitute a significant portion of corporate loans, could decrease due to the decrease in demand for foreign currency loans because of depreciation of domestic currency. For consumer loans, it is found that depreciation of domestic currency decreases loan volume due to the contraction in purchasing power.

CHAPTER 6

CONCLUSION

Credit growth can significantly affect the economic activity, various macroeconomic indicators and social welfare. This makes credit growth crucial variable in understanding macroeconomic developments. As a result of the globalization of financial markets, importance of both consumer and corporate bank loans throughout the world increased. These in turn increased the role of bank credit internationally as well. Especially, the recent global financial crisis in 2008 forced policy makers to reconsider financial stability. In this regard, recent discussions focused on the effects of credit growth not only on the real sector through consumption and investment expenditures, but also on the financial sector through its indirect results in financial stability.

The increasing role of bank loans in economic system necessitated a full understanding of credit mechanisms if one is to analyze the working dynamics of the economic system. In the period of post-2008 crisis, monitoring the credit growth was on the agenda of policy makers, especially of central banks. For emerging market economies monitoring credit growth became crucial due to structural fragilities of their economies such as chronic current account deficits, dependence on international financial flows. As a matter of fact, the course of credit growth in Turkey and related macroeconomic effects have been monitored by policy makers after 2008. In this context, the question of “which variables effect the loan growth” has always been important.

In the literature on credit growth, international studies explain credit growth by using macroeconomic indicators and bank-based variables using alternative econometric models. There are a limited number of studies on this topic for Turkey. For this reason, our study attempts to shed light on the determinants of credit growth in Turkey considering different types of bank credit for the period of 2005 q1- 2019 q4.

In our model we include several explanatory variables that are also used in the literature to explain the determinants of credit growth. In order to address the dynamics of the banking sector, domestic and foreign currency deposits, which are the main source of funds for the banking sector in Turkey, are used as bank-specific variables. In order to address the economic dynamics, the inflation rate, economic growth, exchange rate (Usd/Try) and the Central Bank's policy rate are used as the independent variables to explain the loan growth. The loans given by the banking sector in Turkey can be grouped in to consumer loans and corporate loans. While corporate loans are used by legal entities, consumer loans are used to finance durable and non-durable goods. In this study, using the ARDL model, short run and long run dynamics of total loans, corporate loans and consumer loans of the banking sector are analyzed.

Empirical results show that deposit volume, which determines the lending capacity of the banking sector, has a positive effect on loan growth both in the short term and in the long term. However, deposits in foreign currency does not affect the volume of consumer loans which are almost completely denominated in local currency. It can be interpreted that main source of consumer loans are domestic deposits. Local currency loans are financed by domestic currency resources and foreign currency loans are financed by foreign currency resources. It is found that economic growth has a positive effect on credit growth by increasing the investment tendency and encouraging the growth of corporate loans depending on the increase in the income level. It is observed that the interbank money market overnight rate, chosen as the proxy of CBRT policy rate does not have a significant effect on loan growth. It is found that the effects of inflation and exchange rate on credit growth are different in the short-term and long-term. Inflation negatively effects consumer loans in the short-run, however its long-run effect is positive. It can be evaluated that inflationary environment could affect consumption and borrowing behavior of consumers differently through different time horizons. Similarly, the impact of depreciation of domestic currency on both consumer loans and corporate loans varies depending on term. Depreciation of domestic currency increases each loan in the short-run and decreases in the long-run. It can be interpreted that in the short-run depreciation of domestic currency increases the need of financing, while in the long-run depreciation of domestic currency discourages economic agents'

borrowing. This can be explained by the increase in cost of borrowing of FX denominated loans, decrease in the domestic purchasing power, decrease in the investment incentive and credit rationing in times where domestic currency depreciates.

The results obtained in this study provide important guidelines to policy makers and future researchers, since they explain the short and long-term dynamics of loan growth and analyze the growth dynamics for different loan types. Banks' lending capacity and economic growth contributes to credit growth regardless of the loan type and term. However, effect of exchange rate on credit growth could be different in the short-run than in the long-run. This finding could be interpreted as the change of borrowing behavior through time. This analysis could have important implications for regulation of bank loans. Our study shows that the factors affecting credit dynamics in the short run is different than the long-run. This aspect of our finding can be further analyzed at the micro level by using bank level data.

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APPENDICES

A. TURKISH SUMMARY / TRKE ZET

Ekonomik aktivite ekonomik ajanların tketim ve yatırım harcamalarından tarafından etkilenmektedir. Ekonomik ajanların bu harcamalarının srdrlebilir olması uzun vadedeli ekonomik bymeyi beraberinde getirmekte ve toplumsal refahı önemli ölçde etkilemektedir. Bu noktada, tketim ve yatırım harcamalarının srdrlebilir olması bu harcamaların finansmanının saėlanmasına baėlıdır. Modern ekonomik sistemlerde bu harcamaların srdrebilirliėinin desteklenmesi iin gerekli finansmanın saėlanması finansal sektrn desteėiyle gerekleşir. Ekonomik sistemlerde, genel olarak ekonomik ajanların bazıları fon fazlasına (tasarruflara) sahipken, bazıları ise fon ihtiyacı duymaktadır. Fon ihtiyacı ve fazlası olanların buluřturulması ve kaynakların etkin daėılımının saėlanması ise finansal sektrde finansal aracılık hizmeti saėlayan kurumlar tarafından gerekleştirilmektedir.

Mevcut kresel finansal sistemde, finansal aracılık iřlemlerinin önemli kısmı bankalar tarafından gerekleştirilmektedir. Bankalar fon fazlası olan taraflardan ellerindeki fonu belirli bir faiz demesi karřılıėında dn alırken ve belirli bir faiz demesi karřılıėında fon ihtiyacı olan tarafa dn vermektedir. Bankalar bu faaliyetleriyle taraflar arasındaki bilgi asimetrisi problemini zmř ve fonların etki daėılımını saėlamıř olurlar. Bu sayede, finansal sektrn finansal aracılık hizmetleriyle reel sektre (firmalara) finansman saėlar ve yatırımların ve retim kapasitelerinin artırılmasına destek olurken, bireysellere (tketici) saėladıkları finansman ile dayanaklı ve dayanıksız mallara olan talebe destek olarak ekonomik aktiviteyi canlandırır. Finansal aracılık iřlemleri ekonomik sistemlerde oynadıkları bu rol nedeniyle ekonomik kaynakların verimli kullanılmasına, bymeye ve ekonomik taraflar arasından bilgi asimetrisinden kaynaklanabilecek aksaklıkların nne geerek toplumsal refaha katkı saėlar. Banka kredileri ise geniř alandaki kullanımlarıyla finansal aracılık rn olarak n plana ıkmaktadır. Finansal piyasaların etkin iřleyiřinin ne kadar önemli olduėu 2008 yılındaki kresel finansal krizle tecrbe edilmiř, bu tecrbesi sonrasında finansal piyasalara dair

politikalar önem kazanmış, banka kredileri de gerek finansal piyasalara gerek ekonomik aktiviteye olan etkisi nedeniyle daha dikkatli incelenmeye başlamıştır. Kredi büyümesinin hangi faktörlere bağlı olduğu, kredi mekanizmalarının etkin şekilde çalışması, kaynakların etkin dağılımının sağlanması ve ekonomik büyümenin sürdürülebilirliği açısından önem içermektedir. Gelişmiş ülke örneklerinde finansal aracılık hizmeti sağlayan kurumlar ve ürünler daha fazla çeşit içerirken, Türkiye özelinde bu işlemlerin bankalar tarafından yürütüldüğü bilinmektedir. Bankacılık sektörünün Türkiye’deki gelişimine bakıldığında 1990’lı yıllardan itibaren bankacılık sektörünün gelişmeye başladığı, zaman içerisinde başta kredi olmak üzere bankacılık ürünlerinin etkin kullanımının arttığı görülmektedir. Bu süreçte 2001 yılında Bankacılık sektöründe yaşanan problemler Şubat 2001 krizine meydan olmuş, krizi sonrası süreçte Türkiye’de özellikle bankacılık sektöründe birtakım düzenlemeye gidilerek bankacılık sektörünün sürdürülebilir şekilde işlemesi hedeflenmiştir. Benzer şekilde, 2008 krizi de politika yapıcıların yeni düzenlemelere neden olmuş. 2008 krizi sonrasında TCMB tarafından fiyat istikrarı hedefine finansal istikrara hedefi de eklenmiş, kredi büyümesinin seyri finansal istikrarı etkileyen bir unsur olarak daha etkin takip edilmeye başlanmıştır. Gerek tüketim ve yatırım harcamalarının finansmanı olan etkisi gerekse küresel ekonomik krizde tecrübe edilen yanı sıra finansal istikrara etkisi, kredi büyümesini analiz edilmesi gereken önemli bir fenomen haline getirmiştir. Bu çalışmada, Türkiye’de kredi büyümesini belirleyen faktörlerin belirlenmesi hedeflenmiştir. Kredi piyasasındaki dinamikleri doğrudan bir etkileyicisi olan para politikasının çalışma dönemi boyunca bazı dönüşümler geçirdiği bilinmektedir.

Türkiye’de TCMB tarafından uygulanan para politikası çerçevesi 1990’lı yıllarda parasal büyüklüklere önem veren stratejilere ve IMF tarafından gelen istikrar programı ile birlikte sabit döviz kuruna dayalı programlarla enflasyon hedeflemesi stratejilerine bırakılmıştı. 2001 yılında yaşanan krizle birlikte dalgalı kur rejimine geçilmiş, 2001 krizinden sonra TCMB kanununda yapılan değişiklikler gibi yapısal değişikliklere gidilmiş ve enflasyon hedeflemesi rejimine geçilmiştir. Enflasyon hedeflemesi rejimi için gerekli mali disiplinin sağlanamaması, enflasyonda döviz kurunun belirleyici olması ve fiyatlama davranışlarında geriye dönük eğilimler olması nedeniyle 2002-2005 yılları arasında “örtük enflasyon hedeflemesi” rejimi uygulandı. 2006 yılından itibaren

tam anlamıyla enflasyon hedeflemesi rejimine geçilirken, 2010 yılı itibarıyla küresel finansal kriz deneyiminden yararlanan TCMB hem enflasyon hedeflemesini hem de finansal istikrarı hedefleyen yeni bir para politikası çerçevesine geçti. Bu dönemde zorunlu karşılıklar, rezerv opsiyon mekanizması ve faiz koridoru aktif bir politika aracı olarak kullanılmaya başladı. ROM ile TCMB rezervleri artırıldı, asimetrik faiz koridoru ile birlikte finansal akımlara bağlı döviz kuru ve kredi büyümesinde finansal istikrarı olumsuz etkileyebilecek hareketlerin önüne geçilmesi hedeflendi. Bu kapsamda, özellikle 2010 sonrası süreçte kredi büyümesinin seyri finansal istikrara olan etkileri nedeniyle TCMB tarafından önemle gözlenir oldu. 2002 yılından itibaren enflasyon hedeflemesi rejiminin gelişim sürecine bakıldığında, 2002-2010 dönemi için enflasyonun düşüş eğiliminde olduğu, küresel kriz sonrası dönemde ise makroekonomik şokların ve sermaye akımlarının oynaklığının etkisiyle enflasyon oranının enflasyon hedefinden uzaklaştığı görülmektedir.

İktisadi literatürde kredi büyümesinin belirleyicilerine odaklanan çeşitli çalışmalar mevcuttur. Çalışmalarda kullanılan modellerin açıklayıcı değişkenleri, hem bankaya özgü özellikleri ifade eden faktörlerden hem de yerel ve küresel makroekonomik koşulları ifade eden değişkenlere içerebilmektedir. Literatürde kredi büyümesi konusunda yapılan çalışmaların detaylarına çalışmamızda yer verilmiştir. Türkiye'ye ilişkin çalışmalar ele alındığında, literatürün kısıtlı olduğu görülmektedir. Türkiye ait çalışmaların bir kısmı aşağıda ifade edilmiştir.

Temel Nalın ve Taşdelen (2016) Türk bankacılık sektörünü 2005-2012 yılları arasındaki aylık veri serileri ile incelemiştir. Çalışmanın modelinde bağımlı değişken olarak toplam banka kredisi hacmini kullanmış, açıklayıcı değişkenler olarak tüketici kredisi faiz oranı, sanayi üretim endeksi (SÜE), bankacılık sektörünün kredi verme kapasitesi, tüketici fiyat endeksi (TÜFE), Takipteki alacaklar (TGA), TCMB'nin faiz ödemelerinden elde ettiği gelir ve reeskont kredisi kullanmıştır. Çalışmanın ampirik sonuçları, bankacılık sektörünün kredi verme kapasitesinin kredi büyümesi ile pozitif, Türkiye Cumhuriyet Merkez Bankasının faiz ödemeleri ve reeskont kredilerinden elde ettiği gelirin kredi büyümesi ile negatif ilişkisi olduğunu göstermektedir. Çalışma, tüketici kredisi faiz oranındaki artış kredi büyümesini olumsuz etkilediği, enflasyon ve TGA'

nın kredi büyümesi üzerinde anlamlı bir etkisi olmadığını söylemektedir. Bakır Yiğitbaş (2015), Türk bankacılık sektörünü 2003-2012 dönemi için analiz ettiği çalışmada, ekonometrik model olarak aylık veri serileri ve sıradan en küçük kareler (OLS) yöntemi kullanmış. Kredi faiz oranları, sanayi üretim endeksi ve reel kesim güven endeksi serileri tek gecikmeli olarak kullanılarak, özel sektör işletme kredisi, kredi faiz oranlarına, sanayi üretim endeksine ve reel kesim güven endeksine açıklayıcı değişken olarak kullanılmıştır. Sonuçlar, kredi faiz oranlarının kredi hacmi ile negatif, sanayi üretim endeksinin ise pozitif bir ilişkiye sahip olduğunu göstermektedir. Banka kredileri ile reel kesim güven endeksi arasında istatistiksel olarak anlamlı bir ilişki olmadığı görülmüştür. Sekmen ve Topuz (2020) çalışmasında 2006-2019 dönemi için Türkiye'de kredi büyümesinin belirleyicilerini incelemiş, çalışmada metodoloji olarak Toda ve Yamamota (1995) ve Hacker Hatemi-J (2006) nedensellik testlerini benimsemiştir. GSYİH büyüme oranı, enflasyon oranı, kamu borcu, para arzı (M2), Türkiye Merkez Bankası (TCMB) gecelik borç verme faiz oranı, FED faiz oranı, sermaye girişleri, döviz kuru, mevduat ve kredi faiz oranları, bankaların karlılık oranları kredi büyümesini açıklamak için kullanmıştır. Ampirik sonuçlar, GSYİH büyümesi, para politikası durumu ve enflasyon oranının kredi büyümesini yönlendiren kilit unsurlar olduğunu göstermiştir. Para politikası faiz oranı ile karşılaştırıldığında parasal büyüklüklerin kredi büyümesiyle daha zayıf bir ilişkiye sahip olduğu düşünülmüştür. Aynı şekilde kredi büyümesi döviz kuru ve sermaye akım hareketlerine FED fon faiz oranlarına göre daha duyarlı olduğu görülmektedir.

Bu çalışmada, 2005Ç1-2019Ç4 dönemi için Türkiye'de toplam kredi büyümesi, ticari kredi büyümesi ve tüketici kredisi büyümesinin analiz edilmiştir. Ekonometrik model olarak hem kısa hem de uzun vadede kredi büyümesini incelemek için Otoregresif Dağılımcı Gecikme (ARDL) modeli seçilmiş, kısa ve uzun vadede kredi büyümesinin belirleyicilerini analiz etmek için her bir kredi türü için ayrı ayrı üç model oluşturulmuştur. Toplam krediler, ticari krediler, bankacılık sektörünün tüketici kredileri bağımlı değişken olarak ayrı modellerde, toplam Türk Lirası mevduat, toplam döviz mevduatı (YP mevduat), politika faizi (bankalararası para piyasası basit faizi (gece-lik)), ABD Doları/ Türk Lirası döviz kuru, tüketici fiyatı endeks (mevsimsellikten arın-

dırılmış, 2003=100), GSYİH (mevsimsel ve takvim etkisinden arındırılmış zincir bağlantılı hacim endeksi (2009=100)) açıklayıcı değişken olarak kullanılmıştır. 2020 yılı itibarıyla, Covid-19 salgını, politika yapımcıları çeşitli alanlarda ekonomi politikalarını desteklemeye zorlamıştır. Bu desteklerden bazıları reel sektör firmalarına ve bankacılık sektörüne sağlanan kredi kampanyaları ve likidite desteklerini kapsamaktadır. Bu nedenle, değişkenler arasındaki uzun dönemli ilişkileri daha iyi gözlemleyebilmek için bu çalışmada Covid-19 pandemi krizinin olağanüstü koşulları ortadan kaldırılması için gözlem dönemi pandemi sürecini içermemektedir. Ampirik modeldeki tüm değişkenler logaritma biçiminde kullanıldı ve parasal büyüklükler tüketici fiyat endeksi ile reel hale getirilmiştir. Veri kaynağı olarak Bankacılık Düzenleme ve Denetleme Kurumu (BDDK), Türkiye Cumhuriyet Merkez Bankası (TCMB) ve Türkiye İstatistik Kurumu (TÜİK) verileri kullanılmıştır. Parasal büyüklükler Bankacılık Düzenleme ve Denetleme Kurumu'ndan (BDDK) alınmaktadır. Kredi verileri, kredi kartı harcamalarını içermemekte ve ticari krediler, toplam kredilerden ihtiyaç kredileri çıkarılarak hesaplanmaktadır. TCMB faizi ve döviz kuru dışındaki tüm değişkenler her çeyreğin son gözlemi olup, döviz kuru ve TCMB faizi her çeyreğin son ayındaki tüm işlem günlerinin ortalama değeridir. GSYİH verileri, Türkiye İstatistik Kurumu'ndan alınan mevsim ve takvim etkisinden arındırılmış endeks değeridir.

Toplam banka kredilerinin tarihsel seyri, kredi hacminin yaklaşık yüzde 30-40'ının döviz kredilerinden oluştuğu görülmektedir. Ticari kredilerde ise döviz kredisi oranının tarihsel olarak yüzde 40 ile yüzde 50 arasında seyrettiği görülmektedir. Bankacılık sektöründeki yasal düzenlemeler nedeniyle tüketici kredileri içinde döviz kredilerinin oranı ihmal edilebilecek kadar küçüktür. Bu oranlar dikkate alındığında banka kredilerinin kaynağı olan yerel para ve döviz mevduatlarının farklı kredi türleri üzerinde farklı etkilerinin olması beklenmektedir. Banka mevduatlarının toplam değerinin tarihsel eğiliminin yukarı yönlü olduğu görülmektedir. Dolarizasyon olgusunun canlı olduğu Türkiye'de yabancı para mevduatın toplam mevduat içindeki payı yüzde gözlem dönemi boyunca 30-50 arasında seyretmiştir. Gözlem dönemi boyunca, 2008 sonrası dönemde FED' in aldığı normalleşme politikaları nedeniyle döviz kurunun (USDTRY) yükseliş eğiliminde olduğu, 2018 yılında ise finansal piyasalardaki oynak-

lık nedeniyle keskin bir yükseliş eğilimi gösterdiği bilinmektedir. Çalışma dönemi boyunca reel GSYİH büyümesinin pozitif olma eğiliminde olduğu söylenebilir. Böylece ekonomik aktiviteyi temsil eden GSYİH endeksi yukarı yönlü bir eğilimde seyretmiştir. 2008 küresel krizi nedeniyle 2008-2009 döneminde, 2018 yılında finansal piyasalardaki gelişmelere bağlı olarak reel GSYİH'nın daraldığı görülmüştür. TÜFE serisinin gözlem dönemi boyunca artmış olup, seri içerdiği mevsimsellikten dolayı mevsimsellikten arındırılmıştır. 2005-2018 döneminde yıllık enflasyon oranının bazen bandın dışına çıksa da yüzde 5 ile 10 arasında bir bantta seyrettiği görülmektedir. 2018 yılı sonrasında finansal piyasalardaki gelişmelerin de etkisiyle enflasyon oranı daha yüksek seviyelere doğru yükselerek enflasyon hedefinden uzaklaşmıştır. Bahsedilen değişkenler zaman serisi analizinde kullanılmıştır.

Zaman serisi analizinde, değişkenler arasındaki uzun dönemli ilişkileri analiz etmek için eşbütünleşme yöntemleri uygulanmaktadır. Eşbütünleşme yöntemi olarak çalışmamızda Paseran ve diğerleri (2001) tarafından geliştirilen Otoregresif Dağıtıcı Gecikme (ARDL) eşbütünleşme yaklaşımı ve sınırlar testi (Bounds Test) değişkenler arasındaki kısa ve uzun dönemli ilişkileri belirlemek için tercih edilmiştir. ARDL yaklaşımı Engle-Granger (Engle & Granger, 1978) ve Johansen Eşbütünleşme yöntemleri (Johansen (1988), Johansen ve Juselius (1990)) gibi diğer eşbütünleşme testlerine göre aşağıdaki avantajlar içermektedir; değişkenler düzeyde veya birinci derecede durağan olabilir veya kısmi olarak eşbütünleşik olsun bu durumlarda uygulanabilir (Imran ve Nishat, 2013, aktarıldığı üzere (Pesaran ve Pesaran, 1997), küçük örneklem boyutunda Engle ve Granger (1987) ve Johansen (1988, 1995) eşbütünleşme yöntemlerine göre daha iyi sonuçlara sahiptir (Narayan, 2005), değişkenlerin uzun vadeli ve kısa vadeli etkileri birlikte tahmin edilebilir ve ARDL modellerinde açıklayıcı değişkenlerin farklı sayıda gecikmeleri vardır. ARDL yaklaşımının tahmini üç aşamaya dayanmaktadır. İlk aşamada, sınır testi kullanılarak değişkenler arasındaki eşbütünleşme test edilir. İkinci aşamada, eğer eşbütünleşme varsa, uzun dönemli katsayılar için ARDL modeli kurulur. Üçüncü aşamada, hata düzeltme modeli ile kısa dönem katsayıları tahmin edilmektedir. (Narayan ve Smyth, 2006). ARDL yaklaşımı ile toplam krediler

(Model I), ticari krediler (Model II) ve tüketici kredi (Model III) ayrı ayrı hesaplanmıştır. Modellerin hepsi spesikasyon testlerinden geçmiş ve sınır testi sonuçları uzun dönem ilişki olduğunu göstermiştir.

Model I uzun dönem sonuçları, bankaların kredi verme kapasitelerinin artması sonucunda yurt içi mevduattaki artışın kredi hacmini artırması beklentisine paralel olarak, yurtiçi mevduat hacmindeki %10'luk artışa karşılık kredi hacminin %4,6 arttığını göstermektedir. Yurt içi mevduata benzer şekilde, yabancı para mevduattaki %10'luk artışın toplam kredi hacmini %6 ,5 oranında artırdığını göstermektedir. GSYİH' deki artışın beklendiği gibi reel kredi hacmini de artırdığı, reel GSYH'deki %10'luk artışın toplam kredi hacmini %13,0 artırdığı görülmektedir. Bankalararası piyasada gecelik borçlanma faizini ifade eden faiz oranının, reel kredi hacmi üzerinde uzun dönemli bir etkiye sahip olmadığı görülmüştür. Enflasyon oranının reel kredi hacmi üzerinde önemli bir etkisinin olmadığı görülmektedir. Bu durum, toplam kredinin TÜFE ile normalleştirilmesinden kaynaklanmış olabileceği değerlendirilebilir. Döviz kurunun etkisi ABD Doları/Türk Lirası ile ölçülmektedir. Döviz kurundaki %10'luk artışın (yani Türk Lirası'ndaki değer kaybı) reel kredi hacmini %5,1 oranında azalttığını görülmektedir. Döviz kurundaki artış, döviz kredilerinin maliyetini artıracığından, döviz kredilerine olan talebin azalması beklenmektedir bu noktada bulgular beklentilerle uyumludur. Ayrıca, yerli paranın değer kaybetmesinin uzun vadede satın alma gücünün azalmasına neden olması ve tüketim eğilimini olumsuz etkilemesi beklenebilir. Ayrıca, yerli paranın değer kaybetmesinden kaynaklanan enflasyon belirsizliği nedeniyle yatırım eğilimi de olumsuz etkilenebilir bu durum kredi talebini düşürebilir. Kısa vade etkilere bakıldığında, yerli paranın değer kaybetmesi uzun vadede olumsuz, kısa vadede olumlu bir etkiye sahip olduğu görülmektedir. Bunun nedeni, dönemler arası borçlanma ve harcama davranışı arasındaki farklılık olarak yorumlanmıştır. Bu çalışmanın ampirik bulgularının genel olarak literatürdeki çalışmalarla uyumlu olduğu söylenebilir. Guo ve Stepanyan (2011), Tan (2012) ve Imran ve Nishat (2013) tarafından yapılan çalışmalar, yurtiçi mevduattaki artışın kredi büyümesini artırdığını göstermektedir. Benzer şekilde Guo ve Stepanyan (2011), Tan (2012), Imran ve Nishat (2013) ve Park ve diğer (2015) çalışmaları yabancı para cinsi yükümlülüklerin kredi artışını

desteklediğini göstermiştir. Literatürdeki çalışmalar, kredi verme kapasitesindeki artışın bankaların kredi verme kapasitesini artırması beklemektedir. Bazı çalışmalarda kısa vadeli sonuçlar uzun vadeli sonuçlardan ayrılmıştır. Imran ve Nishat (2013) çalışmasında kısa vadede yurtiçi mevduatların kredi büyümesi üzerinde önemli bir etkisinin olmadığını bulmuştur. Ekonomik büyümenin reel kredi büyümesi üzerindeki etkisine ilişkin bulgumuz genel literatürle uyumludur. Guo ve Stepanyan (2011), Tan (2012), Imran ve Nishat (2013), Park ve diğerleri (2015), Thaker (2013) Ivanovic (2016), Timsina (2017) ve Chen ve Wu (2014) çalışmalarında ekonomik büyümesinin kredi büyümesi üzerinde olumlu etkisini göstermektedir. Faiz oranına ilişkin sonuçlarımız, faiz oranının kredi büyümesi üzerinde önemli bir etkisinin olmadığını göstermektedir. Literatürdeki çalışmalarda, faiz değişkeni için para piyasası faizi veya mevduat faizi gibi farklı faiz oranları seçilmektedir. Bazı çalışmalar, faiz oranının kredi büyümesi üzerinde olumsuz bir etkisinin olduğunu, bazıları ise faiz oranının anlamlı bir etkisinin olmadığını savunmaktadır. Imran ve Nishat (2013) uzun dönemde para piyasası faiz oranlarının kredi büyümesi üzerinde önemli bir etkisinin olmadığını söylemektedir. Gözgör (2014) ise reel faiz oranındaki düşüşün Türkiye için iç krediyi artırdığını söylemektedir. Guo ve Stepanyan (2011), Türkiye'nin de içinde bulunduğu gelişmekte olan ülkelerde mevduat faiz oranının kredi büyümesi üzerinde olumsuz etkisi olduğunu ifade etmiştir. Bakır ve Yiğitbaş'ın (2015) çalışması, Türkiye'de kredi faiz oranının kredi büyümesi ile negatif ilişkisi olduğu bulgusuna ulaşmıştır. Faiz oranına ilişkin seçilen gösterge değişkene göre bulguların farklılık gösterdiği görülmüştür. Çalışma sonuçlarımızda uzun vadede enflasyonun reel kredi büyümesi üzerinde anlamlı bir etkisi yoktur. Enflasyona ilişkin bulunan sonuçların Imran ve Nishat (2013), Gözgör (2013), Tan (2012), Ivanaovic (2016), Timsina (2017) ve Temel Nalın ve Taşdelen (2016) çalışmalarında bulunan sonuçlarla uyumlu olduğu görülmüştür.

Sonuçlarımızda, yerel para birimindeki değer kaybının kredi büyümesi üzerinde olumsuz etkisi olduğunu göstermektedir. Literatürde döviz kurunun etkisine ilişkin bulgular farklılık göstermektedir. Guo ve Stepanyan (2011), Imran ve Nishat (2013) döviz kurunun kredi hacmini olumlu etkilediğini bulmuşlardır ve bunun yabancı para cinsi kredilerin döviz kurundaki hareketten dolayı maruz kaldığı değerleme etkisinden kaynak-

lanabileceğini belirtmişlerdir. Bu çalışmada, döviz kuru kaynaklı değerlendirme etkilerinden kaçınmak için kredi hacimleri TÜFE serisi ile bölünmüştür. Uzun vadede kredi hacmindeki düşüş, yabancı para cinsinden ticari kredilere olan talebin azalmasından ve satın alma gücünün düşmesinden kaynaklanabilir. Çalışmanın bulguları Pham (2015) sonucu ile uyumludur. Öte yandan Timsina (2017) döviz kurunun kredi büyümesi üzerinde anlamlı bir etkisinin olmadığını, Oloyoko (2011) ise döviz kurunun kredi büyümesi üzerinde pozitif bir etkiye sahip olduğunu söylemiştir. Ticari kredileri ele alan modelimizin sonuçlarına bakıldığında, yurtiçi mevduattaki artışın ticari kredi büyümesini olumlu etkilediğini göstermektedir. Toplam krediler karşılaştırıldığında, yurtiçi mevduattaki %10'luk artışın ticari kredi hacmini %5,2, toplam kredi hacmini ise %4,6 artırdığı görülmektedir. Yabancı para cinsi mevduatlarında da ticari kredi büyümesi üzerinde olumlu etkisi bulunmaktadır. Yabancı para cinsi mevduatlarında %10'luk artışın ticari kredi hacmini %9,0 ve toplam kredi hacmini %6,5 artırdığı görülmektedir. Ticari kredi hacminin, toplam krediye göre yabancı yükümlülüklerdeki hareketlere karşı daha duyarlı görünmektedir. GSYH'deki %10'luk artışın ticari kredi hacmini %12,2 oranında artırttığı görülmektedir.

Ekonomik aktivitedeki artışın beklentileri iyileştirdiğini ve firmaları daha fazla kapasite için daha fazla yatırım yapmaya teşvik ettiğini düşünülebilir. Ayrıca ekonomik büyüme, daha önce de belirtildiği gibi bankaların kredi verme kapasitelerine de katkı sağlamaktadır. Bankaların kredi verme kapasitesindeki artış da ticari kredi büyümesine katkı sağlayabilmektedir. Toplam kredi hacmi sonuçlarına benzer şekilde ticari kredilerin de uzun dönemde TCMB faizinden etkilenmediği görülmektedir. Model II sonuçları, firmaların kredi verme davranışlarının uzun vadeli dinamiklerinin çoğunlukla makroekonomik koşullar ve bankaların kredi arz kapasitesine bağlı olduğunu göstermektedir. Enflasyonun ticari krediler üzerinde toplam krediler sonuçlarına benzer şekilde önemli bir etkisi görülmemiştir. Yerli paranın değer kaybının ticari kredileri daraltıcı yönde etkilediği görülmektedir. Yukarıda da belirtildiği gibi yabancı para cinsinden ticari kredilere olan talep yerli paranın değer kaybetmesi nedeniyle düşebilir, çünkü bu durumda hem kredi maliyetleri artacak hem de yerli paranın değer kaybı özellikle bilançolarında açık döviz pozisyonu olan firmalar için riskleri artıracaktır. Model I ve Model II'ye benzer şekilde yurtiçi mevduatların tüketici kredisi büyümesi

üzerinde olumlu etkisi olduğu görülmektedir. Yurtiçi mevduattaki %10'luk artışın reel ihtiyaç kredisi hacmini %8, ticari kredi hacmini ise %5,2 artırdığı görülmektedir. Tüketici kredilerinde yurt içi mevduatın aksine yabancı para cinsi mevduatların negatif etki (istatistiksel olarak anlamsız) etmektedir. Döviz mevduatlarındaki artış, para ikamesi (dolarizasyon) ve güven eksikliği olarak değerlendirilebilir. Dolayısıyla yurt içi ekonomiye yönelik artan riskler, risk algısına görece daha duyarlı görünen tüketici kredilerini düşürdüğünü düşünülebilir. Öte yandan, ihtiyaç kredilerinin çok küçük bir kısmı döviz cinsindendir. Bu durum, tüketici kredilerinin arzının daha çok yurt içi mevduata bağımlı olduğunu ve tüketici kredilerinin fonlanmasının büyük ölçüde yurt içi mevduatlardan sağlandığını bu sebeple yabancı para cinsi mevduatlara duyarlılığının zayıf olduğu değerlendirmesine yol açmaktadır. Çalışmadaki bulgumuz bu durumu destekler niteliktedir. Tüketici kredilerinin ticari kredilerine göre yurt içi mevduatlara daha duyarlı olduğunu görülmüştür. GSYİH' deki artış, Model I ve Model II sonuçlarına benzer şekilde tüketici kredileri üzerinde olumlu bir etkiye sahiptir. Model III' ün ekonomik aktiviteye ilişkin beklentilerle uyumludur. Ekonomik büyümenin konut, otomobil ve tüketimini artırdığı ve bunun sonucunda daha fazla tüketici kredisi sağladığı değerlendirilmektedir. TCMB faiz oranının tüketici kredileri üzerinde uzun vadeli bir etkisi bulunmamıştır. Enflasyonun tüketici kredisi büyümesi üzerinde ticari ve toplam kredilerin aksine olumlu etkisi bulunmaktadır. Enflasyon beklentilerinin tüketicilerin borçlanma davranışını etkilediği ve bunun da uzun vadede konut kredilerini ve taşıt kredilerini artırabileceği düşünülmektedir. Döviz kurunun, Model I ve Model II' ye benzer şekilde uzun vadede tüketici kredisi büyümesi üzerinde olumsuz etkisi olduğu görülmektedir. Gerek tüketici kredileri gerekse ticari krediler için yerli para birimindeki değer kaybının reel kredi hacmini azalttığı görülmektedir.

Kredi büyümesinin dinamikleri kendi aralarında karşılaştırıldığında, her modelde yerli para mevduatındaki artışın kredi büyümesini artırdığı görülmektedir. Öte yandan, yabancı para mevduatların ticari kredilerinin büyümesine olumlu etkisi olurken, tüketici kredilerine etkisi ise negatif ve istatistiksel olarak anlamsızdır. Yabancı para cinsi mevduatların ticari krediler için önemli bir fon kaynağı olduğu görülmektedir. Ticari kredilerin önemli bir kısmının döviz cinsinden olması nedeniyle, yabancı para cinsi mevduattaki artış, döviz kredilerine kaynak sağlayarak ticari kredi hacmini artırmıştır.

Tüketici kredilerinin tamamına yakınının yerli para cinsinden olması nedeniyle yabancı para mevduatının etkisinin ihmal edilebilir düzeyde olduğu değerlendirilmektedir. Model sonuçları da istatistiksel olarak anlamsız sonuçlar vermektedir. Bu konudaki çalışmaların çoğu, mevduat hacmindeki artışın bankaların kredi verme kapasitesindeki artışa bağlı olarak kredi hacmini olumlu etkilediğini göstermektedir. Ekonomik aktivitenin olumlu seyrinin kredi hacmini artırdığı görülmektedir. Yatırım eğilimini olumlu etkileyen ekonomik aktivitenin olumlu seyrinin ticari kredileri, tüketim eğilimini ve tüketici kredisini artırması beklenmektedir. Benzer şekilde, literatürdeki çalışmalar genel olarak GSYİH' deki artışın kredi hacmini artırdığını değerlendirmektedir. TCMB faizinin her iki kredi türü için de istatistiksel olarak anlamsız olduğu görülmüştür. Enflasyondaki artışın uzun vadede enflasyon beklentilerini şekillendirerek, harcama ve borçlanma davranışlarını etkileyerek tüketici kredisini hacmini artırdığı değerlendirilmektedir. Yerli paranın değer kaybetmesinin bankaların banka kredilerini azalttığı görülmektedir. Ticari krediler içinde önemli bir hacme sahip olan döviz kredilerine, yerli paranın değer kaybetmesi artan maliyetlerine bağlı olarak talebin düşmesi sonucunda döviz kredilerin düştüğü değerlendirilebilir. Tüketici kredilerin ise yerli paranın değer kaybının satın alma gücündeki oluşturacağı daralma nedeniyle hacminin düştüğü düşünülebilir.

Çalışmada elde edilen bulguların, kredi büyümesinin kısa ve uzun vadeli dinamiklerini açıklaması, farklı kredi türleri için büyüme dinamiklerini analiz etmesinden dolayı politika yapıcılara ve gelecek araştırmalara önemli bulgular sunduğu düşünülmektedir. Gelecek araştırmacıların, banka bazlı verilerle çalışarak bankaların büyüklük likidite durumu, aktif büyüklüğü gibi kendilerine has özelliklere bağlı olarak kredi verme davranışı seçili makroekonomik değişkenlere bağlı olarak nasıl etkilendiği incelenebilir. Bu sayede, makroekonomik etkilerin yanı sıra mikro bazda kredi büyümesini etkileyen faktörler ele alınarak politika yapıcılar için yeni öneriler üretilebilir.

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