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CURRENCY SUBSTITUTION: THEORY AND EVIDENCE FROM TURKEY

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ABSTRACT

CURRENCY SUBSTITUTION:
THEORY AND EVIDENCE FROM TURKEY

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In the last thirty-five years, Turkey and many Latin American countries have experienced a phenomenon known as dollarization, in which residents hold a significant share of their assets or liabilities in terms of a foreign currency that is not legal tender. In the case of partial dollarization, the foreign currency starts to serve one or more of the domestic currency's three functions. In contrast, with full dollarization, the domestic currency is wholly abandoned, and a foreign currency replaces it in all transactions and legal payments. This study analyzes the partial dollarization experiences of two Latin American countries (Mexico and Argentina) and Turkey for the 1990 – 2019 period. The dollarization process in each country is discussed from a historical perspective by focussing on the inflation rates, exchange rates, and exchange rate regimes of these countries. Although Argentina had the highest inflation rate and US dollar exchange rate in the period analyzed, Turkey had the highest asset and liability dollarization ratio.

Keywords: Dollarization, Financial Dollarization, Inflation, Exchange Rate Regimes, Turkey, Argentina and Mexico.

ÖZET

PARA İKAMESİ: TEORİ VE TÜRKİYE ÖRNEĞİ

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Geçtiğimiz son otuz beş yılda Türkiye ve birçok Latin Amerika ülkesinde yerleşikler varlık ve yükümlülüklerini yasal ödeme aracı olmayan bir para biriminde tutmaya başlamışlardır. Buna literatürde dolarizasyon adı verilmektedir. Kısmi dolarizasyonda yabancı para, yerli paranın üç işlevinden birini veya daha fazlasını üstlenir. Tam dolarizasyonda ise yerli para biriminden tamamen vazgeçilir ve yabancı para yasal ödemelerde ve tüm işlemlerde kullanılmaya başlanır. Bu çalışma, iki Latin Amerika ülkesi (Arjantin ve Meksika) ve Türkiye'nin 1990 ve 2019 dönemindeki kısmi dolarizasyon sürecini analiz etmektedir. Bu üç ülkedeki dolarizasyon süreci, bu ülkelerdeki enflasyon oranları, döviz kurları ve döviz kuru rejimlerine odaklanılarak tarihsel bir açıdan tartışılmaktadır. Arjantin en yüksek enflasyon ve ABD doları döviz kuruna sahip olmasına rağmen en yüksek varlık ve yükümlülük dolarizasyonuna sahip ülke Türkiye'dir.

Anahtar Kelimeler: Dolarizasyon, Finansal Dolarizasyon, Enflasyon, Döviz Kuru Rejimi, Türkiye, Arjantin ve Meksika.

To My Dear Parents and Sister

Sinem, Yılmaz & Verda SARIÖZ

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ABBREVIATIONS

BCRA	: Banco Central de la Republica Argentina
BANXICO	: Bank of Mexico
CBRT	: Central Bank of Republic of Turkey
CPI	: Consumer Price Index
FC	: Foreign Currency
FED	: Federal Reserve
FXD	: Foreign Exchange Deposit
GDP	: Gross Domestic Product
IFS	: International Financial Statistics
IMF	: International Monetary Fund
NAFTA	: North American Free Trade Agreement
OECD	: Organisation for Economic Co-operation and Development
OPEC	: Organization of Petroleum Exporting Countries
TD	: Total Deposits
TL	: Turkish Lira
US	: United States

CHAPTER 1

INTRODUCTION

Dollarization, which commonly results from the failure to achieve macroeconomic stability, is briefly defined as the use of foreign currency as a store of value, unit of account, or means of payment. The dollarization phenomenon has become a debated issue in Latin America, mostly due to the macroeconomic problems experienced in the region starting from the 1990s. In Turkey, dollarization started after the financial liberalization of the 1980s when the residents were allowed to hold foreign currency deposits.

Dollarization is a versatile concept that is defined by economists in many different ways. Dollarization usually starts with domestic money losing its store of value function. In this case, it is called asset dollarization since residents of countries keep their assets in foreign currency to avoid inflation. While only asset dollarization was used to measure the degree of dollarization in the past, nowadays, the concept of liability dollarization has gained attraction in the literature. With the increase in foreign currency debt in emerging economies after the 1997 Asian crisis, it was observed that dollarization could be realized not only with assets but also with debts. Asset and liability dollarization is commonly defined as *financial dollarization*, and it is the type dollarization observed in most emerging economies. The terms partial, unofficial, or *de facto* dollarization are also used in the literature to define the phenomenon just depicted as financial dollarization. However, in some cases, countries give up their own money entirely and start using a foreign currency as a legal tender. This situation is called full, official, or *de jure* dollarization. Sometimes, the terms *currency substitution* and dollarization are used interchangeably in the literature. However, currency substitution refers to explain the phenomenon in which a foreign currency replaces domestic currency's only medium of exchange function. It is almost

impossible to measure the country's currency substitution rate since the amount of foreign currency circulating in the country is unknown.

Full dollarization has sometimes been defined as a form of currency union. As a monetary union, dollarization does not require loyalty to a common central bank as in conventional monetary unions. Despite the lack of a common central bank, dollarizing countries become dependent on the monetary policies of the countries in which they adapt their currency, as their central banks lose their ability to print money rendering their monetary policy eneffective. Therefore, full dollarization can be defined as a type of monetary union. On the other hand, full dollarization can be defined as a hard peg exchange rate regime. Dollarization is a very extreme version of the fixed exchange rate regime. This definition emerged after many economic crises in the late 1990s.

The common feature that all dollarized countries share is that they have high and chronic inflation in their past. Therefore, it can be said that the primary cause of dollarization is inflation. However, apart from high inflation, there are many other reasons behind dollarization. These include financial liberalization and globalization, portfolio diversity, ratchet affect, budget deficits, high cost of transactions in international markets, inability to borrow in domestic currency, volatility of domestic exchange rates, yield differences arising from exchange rate differences, and other macroeconomic instability.

Although there are many studies on the causes and consequences of dollarization, its benefits and harms are not known with certainty. However, the possible costs of dollarization include loss of seigniorage income, monetary policies' effectiveness, and the central bank's lend of last resort role. According to some economists, these costs can vary from country to country, and some can even offset each other. On the other hand, the benefits of dollarization are that it provides integration with international trade, eliminates exchange rate risk, and provides inflation stability. A widespread benefit of full dollarization is the elimination of the exchange rate risk.

Dollarization is a pervasive macroeconomic problem, especially observed in Latin American countries. The high inflation experienced in the 1980s, the debt crisis

of the 1982s, and many other unfavorable economic shocks that hit the Latin America in the 1990s caused these countries to be mentioned together with dollarization in the 2000s. Dollarization is sometimes seen as a problem in these countries, and sometimes it has been preferred as an economic solution. For example, Panama, Ecuador, and El Salvador applied full dollarization as a solution method to provide macroeconomic stability and to improve trade with the US and started using the US dollar as a legal tender. On the other hand, some countries such as Bolivia, Peru, Cuba, and Mexico saw dollarization as a problem and implemented economic policies to eliminate dollarization.

This study aims to describe and compare the dollarization processes in Turkey and two Latin American countries, Argentina and Mexico. Mexico and Argentina, like Turkey, are two emerging economies that experienced many economic crises. Argentina took part in this study because it constitutes an interesting case study for partial dollarization. Despite many economic problems, Argentina did not accept full dollarization and adopted a currency board system that collapsed in 2001. On the other hand, Mexico similar to Turkey, adopted a floating exchange rate regime and inflation targeting. Thus, to see whether a country that implemented monetary policy strategies similar to Turkey has been successful in elimination dollarization, Mexico was also included as a case study.

Argentina has struggled with hyperinflation in the past and is still struggling with chronic and high inflation today. In Argentina, which had a very bright economy in the 20th century, economic stability could not be achieved after the Great Depression. In the 1980s, the country struggled with hyperinflation and was greatly affected by the economic crises occurring in the Latin America and the world in the 90s. In the 1991 currency board system adopted in the country. Also, Argentina experienced a tremendous economic crisis in 2001. With this crisis, there was an increase in asset dollarization in Argentina. At the end of the crisis, the country had to declare a moratorium. Today, inflation and exchange rates are still very high in Argentina. However, Argentina has rejected the full dollarization advise of the IMF both in the past and present.

Mexico is the second largest Latin American country that, like many emerging economies, had to deal with many economic crises in its past. The foundation of oil reserves in the 1970s had a positive effect on the Mexican economy. There was an economic crisis in Mexico in 1982, and a stand-by agreement was signed with the IMF. Perhaps the most significant economic crisis in Mexico was experienced in 1994, which severely affected Mexico and all Latin American countries. The highest asset dollarization rate in Mexico was seen in 2001. Today, dollarization rates and inflation are relatively lower in Mexico.

Since June 1980 Turkish financial markets have been greatly opened up and liberalized. The dollarization process began in Turkey in 1984 when Turkish residents were allowed to open foreign currency accounts in banks. In addition, privatization practices accelerated during this period. In 1994, the Turkish economy struggled with hyperinflation and an economic crisis. During this period, there was a significant increase in asset dollarization. A stand-by agreement was signed with the IMF in April 1994 to avoid the effects of the crisis. In 1998 Turkey started to implement the crawling peg exchange rate regime. This practice continued until a major economic crisis hit the economy in 2000. This crisis deeply affected the Turkish economy, forcing the government to sign again a stand-by agreement with the IMF and let the exchange rate fluctuate. In the following years, stability was achieved in the economy with the contributions of the IMF agreement. In 2008, however, Turkey was affected by the global financial crisis that started in the US. Today, with high inflation, volatile exchange rates, and some political reasons, dollarization is still an issue on Turkey's agenda.

As a result of comparing the dollarization processes of Turkey, Argentina and Mexico, it was observed that the country with the highest asset and liability dollarization ratios is Turkey. The loyalty to the peso did not decrease despite the persistence of macroeconomic instability in Argentina. Compared with the other two countries, the foreign currency assets and liabilities denominated in foreign currency. were found to be quite high in Turkey. In Mexico, as a result of the policies implemented, dollarization rate decreases considerably.

The rest of this study is structured as follows. Chapter 2 presents a brief review of the literature on dollarization. This chapter will discuss the dollarization terms used in the literature along with their determinants and measurement. The possible benefits and harms of dollarization will be evaluated, and finally, the de-dollarization phenomenon will be analyzed. Chapter 3 provides the dollarization literature relevant to Latin America and Turkey. The partial and full dollarization experiences of the Latin American countries will be discussed, and their efforts to reduce dollarization will be presented. Chapter 4 evaluates the dollarization experiences of Mexico, Argentina, and Turkey from a historical perspective. This chapter will present some stylized facts on inflation history, growth, *ex-post* and *ex-ante* exchange rate regime flexibility, and monetary policies adopted. Also, asset dollarization ratios for the 1990-2019 period and the liability dollarization ratios for the 2005-2019 period will be provided and discussed. Finally, chapter 5 concludes.

CHAPTER 2

DOLLARIZATION

Although dollarization is a phenomenon that has been investigated widely in the literature, it is a challenging and complex concept. Economists have defined dollarization in different ways from the past to the present. Besides, the perspective towards dollarization has changed with some economic events.

This chapter first briefly explains the development of dollarization and then reviews its alternative definitions. Then causes, costs, and benefits of dollarization are discussed along with various measures employed in the literature to quantify it. Finally, the chapter concludes by evaluating the de-dollarization (or reverse dollarization) phenomenon and its strategies.

2.1 Definitions of Dollarization

Research into dollarization has a long history. As discussed in Guidotti and Rodriguez (1992), early studies on dollarization modeled it as a portfolio composition problem that is reversed easily once the relative rates of returns on alternative currencies are equalized. However, Guidotto and Rodriguez refer to dollarization as a continuous process in which markets gradually change the currencies with which transactions are denominated and settled, rather than a portfolio composition decision. A high inflation rate causes an increasing amount of transactions to occur in terms of a stable and more valuable foreign currency. In this sense, dollarization developed in developing countries first as a reverse application of the Gresham's law. Once a currency loses its value rapidly due to high and rising inflation, more valuable foreign money drives out the less valuable domestic one.

Gresham's law has an important place in the economics literature. This law was introduced in the 16th century by Sir Thomas Gresham, the financial adviser of Queen Elizabeth I of England. Only metal money was used in those years, and paper money had not yet been issued. The metal coins contained silver. After a while, coins with less silver content were introduced. Because both coins had the same monetary value, it was more logical to use the low silver content coins in transactions and hold the high silver content coins as a store of value. The first person to notice this was Thomas Gresham. As a result, Gresham concluded that "bad money drives out good," which became known as the Gresham's Law in the literature (Giffen, 1891).

On the other hand, Thiers' Law claims the opposite of Gresham's Law. Thiers' law was introduced in the 18th century by the historian Luis A. Thiers in France. According to this law, "good money drives out bad money." In those days, the coins made from France's precious metals came to the forefront and replaced the other less valuable coins. In the 1800s, large amounts of valuable coins from Spain began to enter France. An increase in demand for these high-valued coins caused them to be used in the markets in place of their low-value counterparts (Ertürk, 1994). According to some economists, Thiers' Law is the anti-Gresham's law. Today, particularly in developing countries, the Thiers Law, which is the opposite of Gresham's Law, applies.

The concept of dollarization came to the fore after the collapse of the Bretton Woods system in the 1970s (Savastano, 1992). At this point, it is necessary to mention the Bretton Woods system briefly. With the widespread use of paper money in the 19th century, countries indexed their money to gold reserves. In other words, central banks would print banknotes as much as their gold reserves. However, the application of the gold standard was abandoned during the First World War. Only the US dollar preserved its place as a currency indexed to gold. This situation enabled the dollar to gain reliability in the world. With the Bretton Woods System, all currencies' value was calculated according to the dollar indexed to gold. In other words, a kind of fixed exchange rate regime had started (Eğilmez, 2018b).

In the 1970s, the Bretton Woods system ended with the US printing money for no return. However, the dollar's leading role was not only due to its past reputation but

also to the calculation of oil prices in dollars. People who did not trust their own domestic money started to hold dollars even after the collapse of the Bretton Woods system (Eğilmez, 2018b). Also, dollarization emerged in developing countries after economic instabilities and dependence on foreign resources (Darıcı, 2004). Usually, the currency set by the Central Bank is expected to perform three functions: store of value, unit of account, and medium of exchange. However, in developing countries, another currency starts to perform all or a few of these functions, initiating the dollarization process.

Dollarization is a versatile concept and has been used to describe many related phenomena. However, commonly dollarization is examined in the literature under two main headings: full (de jure or official) dollarization and partial (de facto or unofficial) dollarization (Yeyati, 2006).

2.1.1 Full Dollarization

Official or full (de jure) dollarization refers to the case where there is a complete change in the domestic currency used in the country. These countries accept some other country's currency as legal tender. The domestic currency no longer fulfills the three functions of money, and the foreign currency has instead assumed these functions. Full dollarization is to give up one country's currency and adopt another country's currency (Calvo, 2001). According to Movchan (2002), with official dollarization, the government completely changes the domestic currency.

Countries with full dollarization lose monetary autonomy or independence. One of the biggest problems in countries that changed their official currency to dollars is the disappearance of their central bank's power to print money. Only Federal Reserve is authorized to print US dollars globally, so in countries with full dollarization, money supply goes beyond the national central bank's control. Examples of countries with full dollarization are Ecuador, Panama, and El Salvador (Table 1).

Table 1: Countries and Territories with Full Dollarization

US dollar	British Virgin Islands, Caribbean Netherlands, Ecuador, El Salvador, Puerto Rico, Republic of Zimbabwe, Republic of Palau, Panama Marshall Islands, Democratic Republic of Timor-Leste, Federated States of Micronesia, Turks and Caicos Islands
Euro	Andorra, Clipperton Island, Monaco, Vatican City, Saint Marino, Saint Pierre and Miquelon, Kosovo, Montenegro, French Southern and Antarctic Lands
Other currencies	Turkish Republic of Northern Cyprus (Turkish Lira), Cook Island (New Zealand Dollar), Macau (Hong Kong Dollar), Lesotho (South African Rand), Palestinian Territories (Israeli Shekel), Nauru (Australian Dollar)

Full dollarization occurs when developing economies abandon their currencies and accept the developed economy's currency as a legal means of payment. Even if the currency in question is not the dollar, this concept is referred to as "dollarization" in the literature (Edwards and Magendzo, 2003c). Developing countries can make other currencies other than the dollar as legal tender. According to Alesina and Barro (2001), the number of independent countries increased from 76 to 193 after World War II. With the increase in the number of independent countries, countries started to issue their own currencies. However, some countries' currencies remained weaker than others. Therefore, these countries gave up their domestic currency and started using a foreign currency as legal tender. Three major currencies are used in the world, including the US dollar, Euro, and Yen, but the US dollar comes first with 88% (Table 2).

Table 2: Currency Distribution of Over the Counter Foreign Exchange Turnover in 2019 (percentage shares of average daily turnover in April)

US Dollar	88.3
Euro	32.3
Japanese Yen	16.8
Pound Sterling	12.8
Australian Dollar	6.8

Resource: BIS-Triennial Central Bank Survey, 2019

According to Müller (1999), the US dollar played a dominant role in the world markets in the past. However, if eurosation occurs in the countries around the euroland, CEECs and Turkey, the euro can compete with the US dollar as the replacement currency. Although the Japanese Yen is the third most used currency globally, the only country that officially uses it is Japan. However, due to trade between Indonesia and Japan, Indonesia could also use the Japanese yen (Alesina and Barro, 2001).

Edwards and Magendzo (2003b) emphasized that monetary unions can take two forms. The first is full dollarization; that is, a country adopts the money of a developed country as its currency. In full dollarization, monetary independence is given up, and the developed country's central bank carries out monetary policy. Panama and Monaco are examples of countries that have become officially dollarized. The second type of currency union is called independent currency unions. In independent currency unions, a group of countries creates a common currency, and monetary policy begins to be carried out by a common central bank (i.e., East Caribbean Currency Area-ECCA and The Economic and Monetary Union of the European Union-EMU). In full dollarization, unlike monetary unions, the monetary base changes, and all contracts are transformed into foreign currency (Tavlas, 2003). Although dollarization and monetary unions are comparable, dollarization is one-sided. The country which has dollarized does not have any control over its monetary policy. Countries that are members of the monetary union determine their exchange rate regimes, but the dollarized country accepts the exchange rate of the country it uses (Palley, 2003).

Choice of Exchange Rate Regime

In the 90s, many national and international economic events took place in the world, and as a result, the exchange rate regime debate started (Klein, 2005). Fixed or pegged exchange rate regimes caused economic crises in Mexico (1994), Thailand (1997), Indonesia (1997), Korea (1997), Russia (1998), Brazil (1998), Argentina (2000), and Turkey (2000). On the other hand, in 1998, South Africa, Israel, Mexico, and Turkey have avoided the financial crisis, which was caused by pegged rates and affected emerging economies with non-pegged exchange rates (Fischer, 2001). A bipolar debate has started worldwide, which stated that countries with international capital flows should adopt either a hard peg exchange rate system or a floating exchange rate system. Exchange rate systems between these two regimes were not deemed to be sustainable. The country that will apply the hard peg should determine a hard exchange system such as the currency board or full dollarization (Klein, 2005). The choice between a country's hard peg and floating exchange rate system depends on its past inflationary history and the economy's characteristics. Hard pegs are systems that are meaningful for countries that experience economic instability or depend on another country in both current and capital transactions. On the other hand, a floating exchange rate system is suitable for economically stable economies or economies not dependent on another economy in capital and current account transactions (Fischer, 2001). The 'fear of floating' criticism assumes that the most appropriate policy for developing countries is to leave the exchange rate fluctuating purely without government intervention. It is thought that interventions in the foreign exchange market may disrupt economic stability. However, the optimal exchange rate regime in which the loss is minimized is possible with the central bank's intervention from time to time (Edwards, 2002).

Determining the exchange rate regime is one of the most important macroeconomic policies. The biggest reason for this is that the exchange rate regime choice has important effects on economic stability and growth. Therefore, economists have a continuous dispute on which exchange rate regime to choose (Kavanoz, 2017). Exchange rate regimes used in the world can be divided into three main groups:

1. *Hard peg regimes* are dollarization and currency board (Stone et al., 2008). Dollarization is the complete removal of the local currency and the use of

a foreign currency. In the currency board, the currency is fixed to a foreign currency (Calvo, 2002). For currency board system the monetary authority needs to have as many international assets as money in circulation and bank reserves (Stone et al., 2008). In hard pegs, exchanged rate volatility is low, and volatility of foreign currency reserves is high (Yeyati and Sturzenegger, 2003).

2. *Soft peg regimes* are soft currency pegs for short. In other words, the country fixes the exchange rate to another currency or a currency basket in a narrow range (Fischer, 2001). Conventional peg, crawling peg crawl-like arrangement, stabilized arrangements, and pegged exchange rates within horizontal bands are types of soft peg regimes (IMF Annual Report on Exchange Arrangements and Exchange Restrictions, 2019). In soft pegs, exchange rate volatility is medium, and volatility of foreign currency reserves is medium (Yeyati and Sturzenegger, 2003).

3. *Floating exchange rate regimes* are the exchange rate systems determined by the market. The monetary authority sometimes intervenes in the market by trading foreign exchange to limit short-term fluctuations (Stone et al., 2008). Floating regimes are divided into two: floating and free floating. In the floating regime, countries implicitly intervene in the exchange rate, while there is no intervention in the free floating regime (IMF Annual Report on Exchange Arrangements and Exchange Restrictions, 2019). In floating regimes, exchange rate volatility is high, and volatility of foreign reserves is low (Yeyati and Sturzenegger, 2003).

While countries implement different exchange rate regimes, they also implement different monetary policy frameworks. According to *IMF Annual Report on Exchange Arrangements and Exchange Restrictions* 2019), countries generally apply four different monetary policies:

1. Exchange rate anchor: The monetary authority buys or sells foreign currency to protect the currency and keep the exchange rate at a certain

level or range. The exchange rate is the nominal anchor of monetary policy.

2. Monetary aggregate target: The monetary authority uses currency reserves, M1 and M2, to achieve a target growth.

3. Inflation target: Monetary authority works to achieve the inflation target announced to the public.

4. Other: There is no predetermined anchor in the country. While conducting monetary policy, various indicators are taken into account.

Countries determine an exchange rate regime and monetary policy framework according to their economic policies. The determined exchange rate regime and monetary policy framework also affect the economic situation in the country.

When looking at the relationship between dollarization and exchange rate regime in the literature, discussions draw attention that the exchange rate regime affects partial dollarization and that full dollarization is actually a hard peg regime.

According to Palley (2003), full dollarization is an extreme form of the fixed exchange rate regime. In a fixed exchange rate regime, monetary policy depends on the maintenance of the exchange rate. This regime may include more severe commitments such as currency board or dollarization, such as fixing to another country's currency, which may be temporary or permanent. For many emerging economies, dollarization is a much better commitment tool than other fixed exchange rate systems (Alesina and Barro, 2001). According to Palley (2003), full dollarization is an upper step of the currency board and eliminates domestic money. The currency board system is the system in which money is allowed to circulate as much as the assets it has in a foreign currency determined by the country. The currency board is an institution that issues money to the market at a fixed rate in return for foreign currency reserves (Gültekin and Yılmaz, 1996). In this system, the government's powers over monetary authority disappear. Budget deficits cannot be financed by printing money because the money supply is strictly regulated. Therefore, in the currency board

system, balance of payments is provided by foreign exchange trading. For example, when the central bank buys dollars, the monetary base expands, and when the central bank sells dollars, the monetary base shrinks. In this way, the balance of payments is tried to be kept in balance (Mundell, 2000). According to Edwards (2002), the currency board alone cannot solve macroeconomic problems and reduce inflation. Also, dollarization protects the country from the balance of payments crises but cannot protect it from banking and financial crises (Fischer, 2001).

On the other hand, some economists have argued that the exchange rate regime affects dollarization. According to Çetinkaya (2018), in developing countries, foreign currency protects its holders from financial losses and serves the three functions of money. Therefore, the exchange rate is a macroeconomic variable that directly affects dollarization. Dollarization is both influenced by the exchange rate and may affect the exchange rate. This interaction varies according to the exchange rate regime. According to many studies, the possibility of partial dollarization increases in high inflation countries with a fixed exchange rate regime. The flexible exchange rate regime relatively prevents partial dollarization. However, some studies do not agree with this opinion. According to Ağaslan and Gayaker (2019), partial dollarization has increased in developing countries after adopting flexible exchange rates. With the introduction of flexible exchange rates in developing countries, national monetary policies' effectiveness has decreased. Alkan (2006) argues that exchange rate changes affect the general level of prices and inflation in countries with a fixed exchange rate regime. In the case of flexible exchange rate systems, this effect is lower. That is, the exchange rate regime choice can lead to inflation and thereby indirectly to partial dollarization.

According to Mundell (2000), the difference between fixed and pegged rates is important. In fixed rate, the money supply is affected by the intervention in the foreign exchange market. In a country with a fixed rate, if there is a surplus in the country, the central bank buys foreign currency to prevent the appreciation of its money. The money supply and expenditures increase when the central bank intervenes in the foreign exchange market. If there is a deficit in the country, the central bank sells foreign currency so that the value of its money does not decrease, money gains value, and expenses are reduced. In other words, in the fixed rate, the balance of payments is

balanced by itself. In the pegged rate system, the exchange rate market can be intervened to keep the exchange rate constant, but the monetary policy is independent. If there is surplus in the country, the country sells government bonds instead of buying foreign currency in order to keep the rate constant. Thus, the intervention in the foreign exchange market does not affect the money supply. In pegged rates, there is no self adjusting mechanism on balance of payments The use of pegged rates can be used as a temporary solution, but intervening in the foreign exchange market, which includes an international system, with a local monetary policy may cause economic turmoil and crises in the country.

According to Calvo and Mishkin (2003), it is essential to fix the exchange rate at the correct rate. It is risky if there is a significant difference between the real level and the fixed level. Therefore, the flexible exchange rate system may seem more attractive. However, the floating exchange rate regime is problematic, although it provides exchange rate flexibility and eliminates the fixed exchange rate. Large fluctuations in the exchange rate affect the real economy and cause financial losses. Countries using the floating exchange rate regime can apply very different monetary policies: money supply target, inflation target, and interest rate target. In addition, in an economy with a floating exchange rate system, while flexible monetary policy provides an advantage in dealing with shocks, giving too much discretionary power to monetary policy can create problems as well (Calvo, 2001). However, after the crises, they experienced in the 90s, Indonesia, Thailand, Russia, Brazil, Mexico, and Korea adopted independently floating exchange rate regimes.

2.1.2 Partial Dollarization

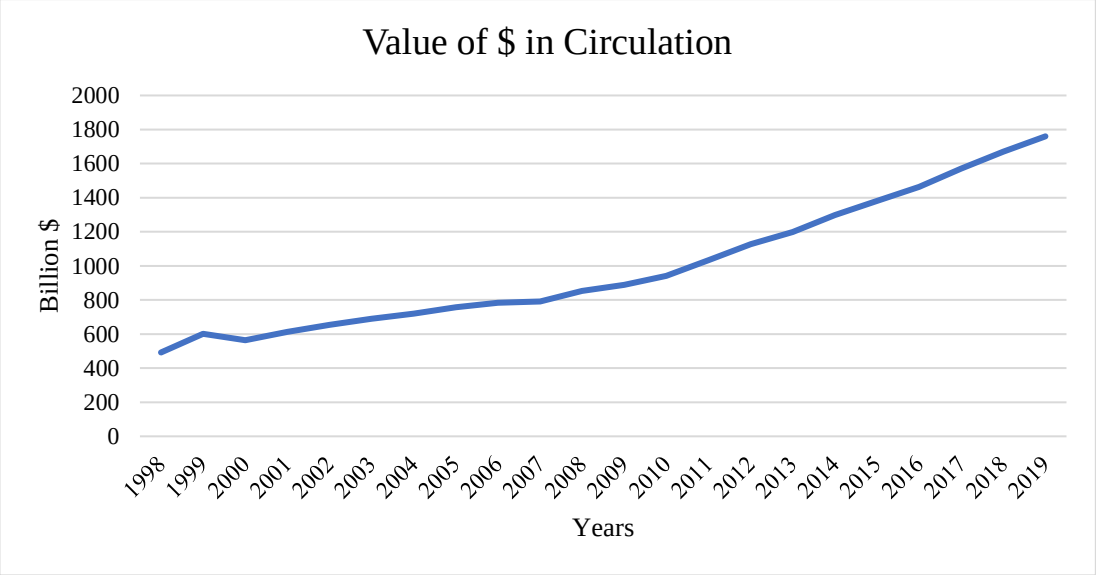
Partial dollarization occurs when a foreign currency undertakes one or more of the three functions of the domestic currency. Unlike full dollarization, the legal tender does not change in partial dollarization.

According to Calvo and Vegh (1992), some currencies in the world lose their medium of exchange function due to inflation. Instead of these currencies, a currency such as the dollar, which maintains its purchasing power, is used. The use of more than one currency in a country as a medium of exchange is called "currency substitution". However, most of the time, the concepts of dollarization and currency substitution are

used interchangeably. Since the amount of dollars in circulation is unknown, dollarization rates are used as an indicator of currency substitution.

According to FED's estimates, as of 2019, almost $1,760 billion was circulating in the world. US Currency Education Program states that half of this amount is thought to be outside of US.

Figure 1: Value of US Dollar in Circulation



Resource: Authors own calculations used (Data from: FED, 2020)

The amount of US dollars that circulate around the world increases every year (Figure 1). Hence, the amount of dollars circulating in countries other than the US is also increasing. However, there is still not enough information to measure currency substitution in countries.

According to Özsöz and Renfigo (2016), partial dollarization is the process where the domestic currency gradually loses its medium of exchange (currency substitution), store of value, and unit of account (asset dollarization) functions against another 'strong' currency. During the asset dollarization process, banks begin to open deposits in foreign currency. Also, more valuable goods such as houses, cars, are quoted in foreign currency. This type of dollarization is also called "de facto" dollarization.

Ize and Yeyati (2005) define partial dollarization as people's holding of their financial assets in foreign currency. Unofficial dollarization may include foreign currency accounts in foreign countries, foreign currency accounts in domestic banks, foreign bonds and non-monetary assets in foreign countries, and foreign currency banknotes held under the pillow. The most crucial point here is that the legal currency in the country is still the domestic currency. In other words, people use foreign currency only as an investment tool. People's loss of confidence in the domestic currency makes foreign currencies more attractive as a means of investment. It is usually seen in developing countries such as Turkey. For example, although the official currency is the Turkish lira, people in Turkey are allowed to open foreign currency accounts in banks. Foreign currency deposit accounts are legal, but the currency in which the payments are made should still be the Turkish lira.

In order to keep the balance sheets in balance, banks lend dollar loans equal to the dollar deposits they open, and thus liability dollarization occurs. A partially dollarized economy means that households and firms hold part of their portfolios in foreign currency assets and/or private and public sector debt in foreign currency (Reinhart et al., 2014).

In the literature, the concept that covers both asset and liability dollarization is financial dollarization.

2.1.2.1 Financial Dollarization

Financial dollarization occurs when foreign currency assets and liabilities are held in the balance sheets of economic units, including foreign currency deposits, loans, non-bank assets, and debts. Financial dollarization is observed in developing countries worldwide and is incredibly high in developing countries where inflation is very high (Ize and Yeyati, 2003). People manage their assets and liabilities by diversifying some in foreign currency to control risks due to inflation. This is referred to as dollarization in the literature because this substitution is generally made in dollars worldwide (Yeyati, 2004).

Honohan and Shi (2002) have defined financial dollarization as the shift of deposits and loans in countries to foreign currencies to protect themselves from inflation and depreciation.

Financial dollarization can be grouped into asset and liability dollarization. Asset dollarization is the shift of economic agents to foreign currency assets to protect their savings from inflation. On the other hand, with liability dollarization, agents start to hold their liabilities in the form of foreign currency. Financial dollarization is frequently encountered, primarily due to financial resentment in developing countries (Aklan and Nargeleçekenler, 2010).

Asset Dollarization

Pepic et al. (2015) argue that economic units want to protect their financial assets' value. Therefore, money first loses its function as a store of value. In other words, financial substitution takes place first. Then prices start to be expressed in foreign currency, and thereby foreign currency takes over the unit of account function. This process starts with high-priced products such as real estate and cars and then spreads to the general environment. Thus, real substitution starts to take place.

According to Akıncı et al. (2005), asset dollarization refers to the dollarization in the asset part of the balance sheets of economic units. Due to the low level of trust in developing countries' financial systems, economic units use foreign currency to store value. Gold and foreign currency are investment instruments in such countries. Besides, in countries with large bank crises, such as Turkey, foreign currency is also used to purchase expensive property. Thus, foreign currency is used both as a means of value storage and in transactions (Sarı, 2007).

Asset dollarization is related to the risks and returns of domestic and foreign assets. Especially in emerging economies where economic stability cannot be achieved, asset dollarization is seen as insurance (Berg and Borensztein, 2000).

Liability Dollarization

For many years, the use of foreign currency as a store of value was only measured by asset dollarization, and liability dollarization was generally ignored. After the 1998 Asia and 2001 Argentina and Turkey crises, liability dollarization gained momentum and began to come to the fore. In emerging economies, the public and private sectors generally borrow in foreign currency. However, this situation increases the vulnerability of countries to external shocks. (Alvarez-Plata and Garcia-Herrero, 2007).

Liability dollarization refers to the foreign currency debts of residents, the banking sector, and the treasury (Sarı, 2007). The foreign currency debt gets larger with the depreciation of the domestic currency and the debt's interest payments. This causes an increase in liability dollarization.

In a study conducted by the Balino et al. (1999), dollar deposits to broad money ratios between 1990-1995 are examined in countries that have been subject to IMF regulation since 1986. The study pointed out countries whose dollar deposits to broad money ratio exceeded the 30 percent threshold. These countries were Argentina, Uruguay, Cambodia, Turkey, Peru, and Bolivia. Banks tend to lend in the currency in which the deposits are denominated. For this reason, they give foreign currency loans as much as their foreign exchange deposits. This situation causes liability dollarization (Calvo, 1999). According to Ize and Yeyati (2003), asset dollarization is like the mirror image of liability dollarization. In other words, as asset dollarization increases, there is an accompanying increase in liability dollarization.

Liability dollarization can increase the impact of financial crises because the depreciation of the domestic currency usually triggers financial crises. The depreciation of the currency increases the foreign currency debt burden and opens the door to a financial crisis. Therefore, foreign currency debts make emerging market economies more fragile (Bocola and Lorenzoni, 2020). Also, liability dollarization makes the floating exchange rate regime implementation more difficult. The monetary authority does not want the exchange rate to fluctuate if it knows that devaluation can cause significant stress in the financial system (Mishkin and Savastano, 2000). Countries that implement floating exchange rate regimes must limit liability

dollarization through fiscal regulations. For example, Argentina and Chile economies came to a standstill in the crisis that took place in Russia in 1998. However, this crisis's effects were short-lived thanks to Chile's financial policies (Calvo and Mishkin, 2003).

Some of the governments' fiscal regulation policies may increase liability dollarization. Governments can make a banking arrangement such that foreign assets are equal to foreign liabilities. Foreign currency deposits cause banks to lend in foreign currency to avoid exchange rate risk, which leads to liability dollarization. (Calvo and Mishkin, 2003)

2.2 Determinants of Dollarization

With the increase in the number of countries gaining their independence, many different currencies have emerged. However, not all currencies have the same power in global markets.

After the 1970s, dollarization became widespread with financial liberalization and globalization. This liberalization has led to the integration of financial markets. With the abolishment of foreign exchange controls and by allowing individuals to hold foreign currency, foreign currencies have become an alternative to national currencies (Hekim, 2008).

The main reason for dollarization is macroeconomic instability. High inflation, fluctuations in exchange rates, and economic crises are among the most important instabilities that have paved the way for dollarization.

High inflation rates and high inflation expectations trigger dollarization. With high inflation, the domestic currency begins to depreciate. Therefore, people aim to minimize the loss they experience in the face value of money by converting their economic assets into foreign currency. For Ramirez-Rojas (1985), in countries where inflation is very high, money loses value continuously. Therefore, people tend to shift their savings to more reliable foreign currencies. In countries with high and continuous inflation, dollarization has become inevitable (Balaylar, 2001). Thus, the most crucial driving factor for asset dollarization is inflation. Hyperinflation increases the cost of holding domestic money and encourages dollarization (Alvarez-Plata and Garcia-

Herrero, 2007). Although inflation is the main reason for dollarization, it can be observed that inflation has also decreased in dollarized economies. Edwards and Magendzo (2003b) examined the performance of dollarized economies. They found that inflation in dollarized countries is 3-6% lower than inflation in non-dollarized countries. However, according to Edwards and Magendzo, dollarized countries experience a trade-off. The price of having lower inflation with dollarization is a more volatile economy and almost the same growth level.

The uncertainty of real return in the portfolio creates risk. People prefer portfolio diversity in order not to be affected by this return uncertainty. Ize and Yeyati (1998) examined the effect of inflation fluctuations and depreciation on financial dollarization. While inflation fluctuations affects local assets, real depreciation affects foreign assets. This situation affects the portfolio choices. Dollar assets are safer if inflation fluctuations are more significant than the real exchange rate risk. This increases the tendency towards foreign assets and causes an increase in dollarization. Financial dollarization is the result of the optimal portfolio choice problem (Ize and Yeyati, 2003). Stable inflation and fluctuating exchange rates provide low dollarization. Even floating exchange rates can cause de-dollarization (Ize and Yeyati, 1998).

The ratchet effect phenomenon is thought to influence dollarization, although it is not exactly a reason for dollarization. The concept referred to as the Ratchet effect or dollarization hysteresis in the literature means that people's demand for a foreign currency does not decrease even if economic instabilities are corrected. In other words, even if the factors that cause dollarization in the economic environment disappear, the process of dollarization still continues (Kumamoto, 2014). According to Ize and Yeyati (2003), even if inflation is brought under control in emerging market economies, residents continue to keep some of their assets and liabilities in foreign currency. The number of countries that are de-dollarized when inflation falls is very few. The biggest reason for this is that foreign currency is seen as safer because the domestic currency cannot be free from the exchange rate effect (Alvarez-Plata and Garcia-Herrero, 2007).

Another reason for dollarization is the existence of budget deficits. High budget deficits result in a high and fragile debt stock. This causes macroeconomic instability and leads to an increase in dollarization. The high budget deficit triggers public borrowing and increases the risk premium paid. Therefore, if the country's saving rates are low, the country necessarily borrows from foreign countries. Increased foreign currency debt also increases dollarization (Serdengeçti, 2005).

The volume of international transactions, the shallowness of the domestic capital market, and the high transaction costs in money exchange also cause dollarization. Foreign currency demand and international transactions' volume must have a stable relationship for international transactions to take place. The lack of domestic capital markets restricts the financial investments of non-residents and thereby contributes to dollarization. Since the transaction costs involved in domestic for foreign money exchange will be less than those in money for goods, if there is no restriction in holding foreign currency, people can turn to foreign currency (Ramirez-Rojas, 1985).

Countries cannot borrow from outside in their own national currency, and they have to borrow in foreign currency. This has been described as the *original sin* by Eichengreen et al. (2005). Countries have to use foreign currency for their international transactions due to the original sin. Also, the countries' largest income source is taxes, and these are denominated in local currency. Foreign debts are financed by these tax revenues and cause a currency mismatch. Also, when countries borrow in foreign currency, their debt increases after the real exchange rate depreciation. At this point, liability dollarization increases (Sarı, 2007).

2.3. Costs and Benefits of Dollarization

Dollarization has several negative and positive consequences for the economies. However, these costs and benefits may vary according to the type and degree of dollarization.

Costs

- If a country starts to use foreign currency as a means of payment (official dollarization), it will give up the seigniorage income. Seigniorage incomes

are an important source of income for governments in some developing economies such as Mexico, Peru, and Uruguay. However, seigniorage loss can be prevented. A seigniorage sharing agreement can be signed with the country whose money has started to be used. Thus, the dollarized country would receive a particular share of the seigniorage income. In such a case, both countries would benefit (Edwards and Magendzo, 2003a).

- Independent monetary policy cannot be applied in countries with full dollarization. This is because the money used in the country does not depend on the Central Bank. As the degree of monetary substitution increases, the effectiveness of the country's monetary and stability policies decreases. Togay (1997) argues that dollarization negatively affects monetary policies in a country. It restricts central banks from determining their monetary policies independently and prevents the application of stabilization policies. Especially in the monetarist approach, if the stabilization policies are affected negatively, it can put the economy in a deadlock. In economies with partial dollarization, monetary policy needs to choose between interest rates, monetary aggregates, and exchange rates to achieve control.

- Full dollarization means giving up an independent monetary and currency policy. Dollarization and the currency board are confused on this issue because a country that has a currency board cannot devalue. The primary purpose of the currency board is to remove the pegged exchange rate application. In fact, the main goal of a country that implements a currency board is full dollarization. Reintroducing the local currency is a complicated process, if not impossible, because the currency to be used in place of the dollar will be less valuable than the dollar. Therefore, full dollarization is like a currency board without an exit option. (Berg and Borensztein, 2000).

- Excessive fluctuations in exchange rates may occur as a result of partial dollarization. In such a case, income inequality increases, and people with foreign exchange debts and low-income levels become poorer (Darıcı, 2004).

- Credit markets are affected by asset dollarization. As the foreign exchange deposits (henceforth, FXDs) in banks increase, the portfolios of commercial banks change, and it becomes difficult for banks to lend in domestic currency. This causes difficulty for national firms in terms of finding the finance they need for their investments, as they tend to borrow in national currencies rather than in foreign currencies (Aydın, 2009)

- Another consequence of dollarization is that it causes instability in money demand. Instability in money demand, in turn, affects monetary policies. In the dollarization process, the flexibility of the money demand function increases. However, the flexibility and instability of money demand can cause exchange rate volatility (Giovannini and Turtelboom, 1992).

- Dollarization prevents the central bank from acting as a lender of last resort (LLR). This can pave the way for crises. The central bank acts as a LLR in most economies. This means that the central bank can lend to banks in case of a sudden demand for liquidity. In other words, bank deposits and short-term creditors are under the guarantee of the central bank. However, in a country with full dollarization, the central bank loses its ability to print money and loses its role as a LLR (Chang and Velasco, 2002). However, Calvo (2001) disagrees with this view. The lender of last resort role in developed economies indicates that public debt is financed by bonds, not by printing money. Therefore, a dollarized country's lack of ability to print money does not take the role of LLR away.

- Foreign dependency increases in a country experiencing full dollarization. For countries that attach importance to foreign policy and diplomacy, increasing foreign dependency comes at a high cost. Having an independent national currency prevents dependency on another country. For some countries, the national currency promotes political authority in economic terms. However, dollarization spoils this situation, and the dollarized country becomes dependent on the country whose currency is declared as legal tender (Cohen, 2000).

Benefits

- The most significant advantage and attraction of full dollarization is that it eliminates exchange rate adjustments. This leads to more stable international capital movements, and the trust of international investors in the country increases. Therefore, investments in the country increase and lead to positive growth results (Berg and Borensztein, 2000).

- According to Cohen (2000), full dollarization means financial integration with the US. In other words, it means that the efficiency of financial institutions and the quality of services in the country will improve. Dollarization provides institutional changes, low inflation, and transparency in developing countries.

- The dollar is used as an international currency in the world. Therefore, international trade is made with the US dollar. A fully dollarized country is more easily integrated into international markets (Berg and Boresztein, 2000). However, Klein (2005) claimed that dollarization did not provide a trade integration.

- Full dollarization defends against money supply-driven inflation by removing the central bank's ability to print money. This, in turn, leads to low interest rates and an increase in financial market confidence. The main reason for this is that dollarization eliminates the exchange rate risk, that is, the possibility of devaluation (Palley, 2003). In addition, devaluation risk increases country risk and default risk. As foreign currency risk is eliminated with dollarization, country risk and default risks decrease. Dollarization eliminates currency crises in emerging economies (Berg and Borensztein, 2000).

2.4 Measurement of Dollarization

Many different methods have been used in the literature to measure partial dollarization. In addition to these methods, researchers have used different indices according to the type of dollarization they focus. However, dollarization measurement is a complicated economic issue. The biggest reason for this is that the exact amount of currency that the household hides under the pillow is unknown. Despite this,

economists have also created indices that can be considered in the measurement of dollarization.

According to the study conducted by Akıncı et al. (2005) asset dollarization is calculated as:

Asset Dollarization= Foreign Exchange Portfolio[1] / Total Portfolio[2]

However, many economists do not use this measure due to a lack of data. The deposit dollarization ratio is commonly used when measuring asset dollarization. The most commonly used measure for dollarization is deposit dollarization, which can be defined as the share of *FXDs in total deposits* (Mwase and Kumah, 2015):

Deposit Dollarization = FXD / Total Deposits

In place of total deposits, some form of money supply can also be used like M1 or M2. Although this measurement is widely used, it ignores investment instruments other than foreign currency deposits. Despite this drawback, this rate is used to measure dollarization in most studies due to data problems (Akıncı et al., 2005).

The following ratio should be used to measure liability dollarization (Akıncı et al., 2005):

Liability Dollarization= (Foreign Currency Credits / Total Credits) + (Domestic Dept Stock in Foreign Currency/ Total Domestic Dept Stock) + (Total External Dept Stock/ GDP)

However, due to lack of data, credit dollarization is generally used when calculating liability dollarization:

Credit Dollarization = Loans in FC (private sector) / Total Credits

In addition, IFS shares foreign currency denominated liabilities to total liabilities data that makes it easier for us to learn about liability dollarization.

[1] Foreign exchange (FX) portfolio includes FX banknotes, FX deposits, FX-based government bonds, Eurobonds, FX-based securities investment fund, and foreign country stocks and assets.
[2] Total Portfolio includes FX portfolio, TLs in circulation, TL deposits, TL-based government bonds, TL-based securities investment fund, TL securities-insurances-other assets, and repo.

Reinhart et al. (2014) created a different index that measures both liability and asset dollarization. This measurement, which is referred to as a "composite index" in the literature, can be calculated as follows:

FXD/M2Y + Domestic Debt Stock in Foreign Currency /Total Domestic Debt Stock + External Debt Stock/GNP

The first part of the index shows the foreign currency deposits in the money supply. As aforementioned, this is the most widely used rate in the measurement of dollarization. The second part covers all domestic sectors' external liabilities, and the third part covers the foreign liabilities of the public sector in foreign terms (Yalçıner and Mutlu, 2018).

2.5 De-dollarization

According to Edwards (2001), it is argued in the literature that dollarization provides growth and prosperity and increases reliability. The studies that favor full dollarization try to make it attractive by saying that in countries that give up their domestic currency, foreign investments will increase, interest rates decrease, and economic performance will improve. Full dollarization advocates have even imposed dollarization as the best option for some emerging economies. However, dollarization advocates have focused on historical data and small economies. We do not have clear information about the harms and benefits of dollarization. Therefore, the attractive aspects of dollarization have been left aside in some countries, and a "de-dollarization" process has begun.

According to Fernández-Arias (2006), financial de-dollarization is possible with anti-dollarization policies developed against dollar debt. These policies include incentives to deter and restrict financial dollarization.

Reinhart et al. (2014) focused on countries that succeeded in de-dollarization and failed in this regard. Countries that succeeded in de-dollarization or, in other words, managed to reverse their foreign exchange obligations have implemented one of two different strategies. The first is to amortize the unpaid debt and thereby stop the issuance of this security. For instance, Mexico has paid its debts in dollars after the crisis in 1994 and then stopped issuing domestic and foreign bonds. The second is to

change the currency. Argentina converted the dollar-indexed bonds that it issued during the 2001 crisis to its local currency. However, despite severe restrictions placed on dollar deposits in some countries, these restrictions were lifted due to economic instability, and dollarization started to increase despite falling inflation rates (i.e., in Peru and Bolivia).

The first step of de-dollarization is convincingly achieving macroeconomic stability and stability in inflation (Kokenyne et al., 2010). The de-dollarization process can be challenging and costly. Therefore, very few countries have been able to achieve this (Galindo and Leiderman, 2005).

According to Kokenyne et al. (2010), exchange rate regimes may affect the de-dollarization process. In the flexible exchange rate regimes, the monetary authority can help the de-dollarization process by providing inflation stability with inflation targeting. However, less flexible exchange rate regimes, in other words, fixed exchange rate regimes, can increase FXDs by increasing the devaluation expectation in individuals. It also makes it difficult to implement an independent monetary policy in countries with a fixed exchange rate. Therefore, it is very difficult to maintain inflation stability with monetary policy. More flexible exchange rate regimes facilitate the de-dollarization process.

Economic stability declined in countries that were dollarized but later adopted their independent currency and implemented an independent monetary policy (Schuler, 2005). However, according to Ize and Parrado (2002), dollarization is a natural consequence of globalization. Dollarization is not a concern if good economic management is achieved. Thus, neither dollarization nor de-dollarization is a solution for economic stability.

CHAPTER 3

DOLLARIZATION IN LATIN AMERICA AND TURKEY

The previous chapter mentioned that partial and full dollarization generally occurred in emerging economies due to macroeconomic instability. Among the emerging market countries, Latin American countries constitute one of the most dollarized regions globally. The biggest reason for this is this region's proximity and trade with the USA. In addition, many economic problems and crisis in Latin America since the 1980s fueled the dollarization debate. Dollarization is also very high in Turkey. Both in Turkey and in Latin America, the concept of dollarization has started to become widespread after the 1980s. It came to the fore after the financial liberalization of the 1980s and turned into a fiercely debated topic after the Turkish economy was hit by many economic crises that pawed their way to high and stubborn inflation rates and volatile exchange rates.

This chapter starts by surveying the full and partial dollarization processes experienced by the Latin American countries. It discusses these countries' economic conditions before and after dollarization and the influence of exchange rate regimes adopted. Particular emphasis will be given to Argentina and Mexico. This chapter also surveys the studies on dollarization for Turkey. This discussion will serve as a reference point for Chapter 4, where we compare Turkey's dollarization experience with that of Argentina and Mexico.

3.1. Dollarization in Latin America

There was a rapid increase in dollarization in Latin America between the 1990-2001 period. While high dollarization was observed in Bolivia and Uruguay, relatively lower dollarization rates were observed in Costa Rica, Dominican Republic, Honduras, Paraguay, and Nicaragua. In some Latin American countries, there has been formal dollarization, where wages and goods and services are paid in foreign currency, and

the dollar is used as a means of payment (Rennhack and Nozaki, 2006). In particular, El Salvador, Panama, and Ecuador have abandoned their currencies entirely and switched to official dollarization. However, Brazil, Mexico, Chile, Colombia, and Venezuela also experienced many economic problems but rejected full dollarization (Chai and Yue, 2019). Financial dollarization has increased in these countries after an inflation-driven economic crisis that has shaken confidence in the domestic currency. These countries are applying economic policies and legal regulations to keep the demand for domestic currency stable. FXDs have declined in Latin America after 2001, but partial dollarization is still relatively high. The main reasons behind this are high inflation, financial deficits, foreign debts, and public debts (Chai and Yue, 2019).

3.1.1. Full Dollarization

In the past, there has been full dollarization in a few Latin American countries. These countries are Panama, Ecuador, and El Salvador.

Panama

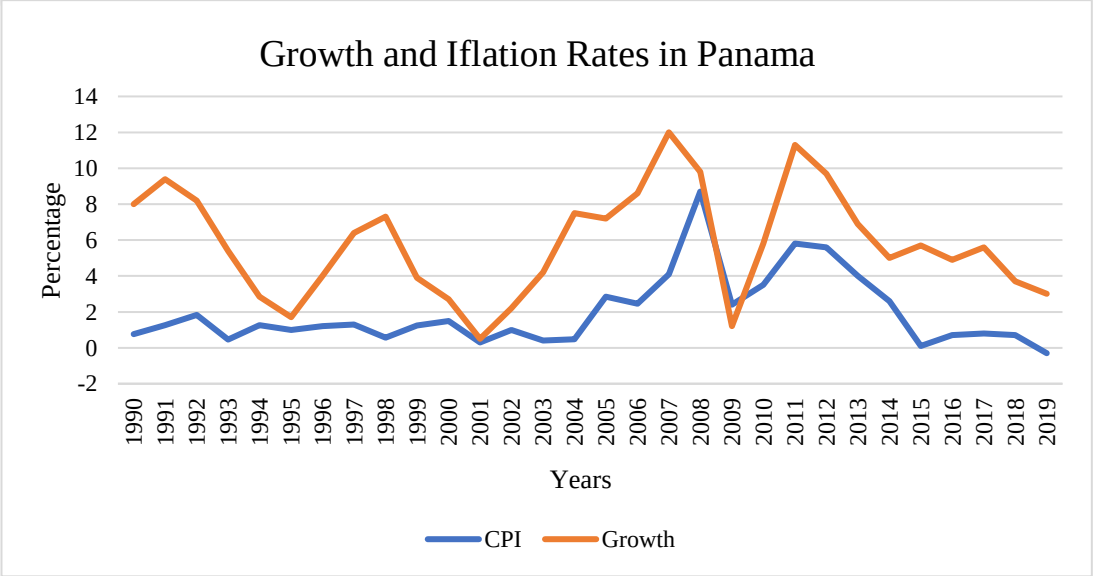
In Panama, a Central American country, dollarization started after leaving Colombia in 1903. Panama, which gained independence with the USA's support, adopted the US dollar as its official currency after the construction of the Panama Canal. Panama is the first Latin American country to experience dollarization. In Panama, banknotes are provided in US dollars and coins in balboa (Winkler et al., 2004). Panama stands at the center of the trade between America and Latin American countries due to its geographical location. Moreover, Panama has the most extensive ship registry system in the world due to its 'flags of convenience' application. Another important part of the country's economy is the free zones. (There are officially 18 free zones in the country.) Especially "Colon Trade Free Zone" is the second largest free zone globally with a US dollar trading volume of 20 billion. Many companies store their processed products in the Colon Trade Free Zone and market them to other countries through re-export (The Foreign Ministry of the Republic of Turkey, 2020).

According to Edwards (2001), many economists consider full dollarization as the only solution for many emerging economies. However, the benefits and harms of full dollarization are not known precisely. Dollarization had a positive effect on Panama, but it is a fairly small country. Panama lowered post-dollarization inflation,

and its economy grew by 5.3% between 1958-1998. Such a high growth rate is usually observed in non-dollarized countries. However, this economic success is also due to Panama's dependence on the IMF. Nevertheless, it is a fact that Panama is more successful than Argentina in its dollarization experience, which applied a currency board system to eliminate the risk of devaluation.

Price stability, which is one of the expected results of dollarization, has been realized in Panama. In 2019 Panama even experienced a deflation of 0.36% (World Bank, 2020).

Figure 2: Growth and Inflation Rates between 1990-2019 in Panama



Resource: Authors own calculations used (Data from: World Bank, 2019)

Until 2005, Panama was able to keep inflation in the 0-2% band. With the global economic crisis of 2008-2009, both inflation and growth decreased in the country. In the last decade, a decrease was observed in both rates (Figure 2).

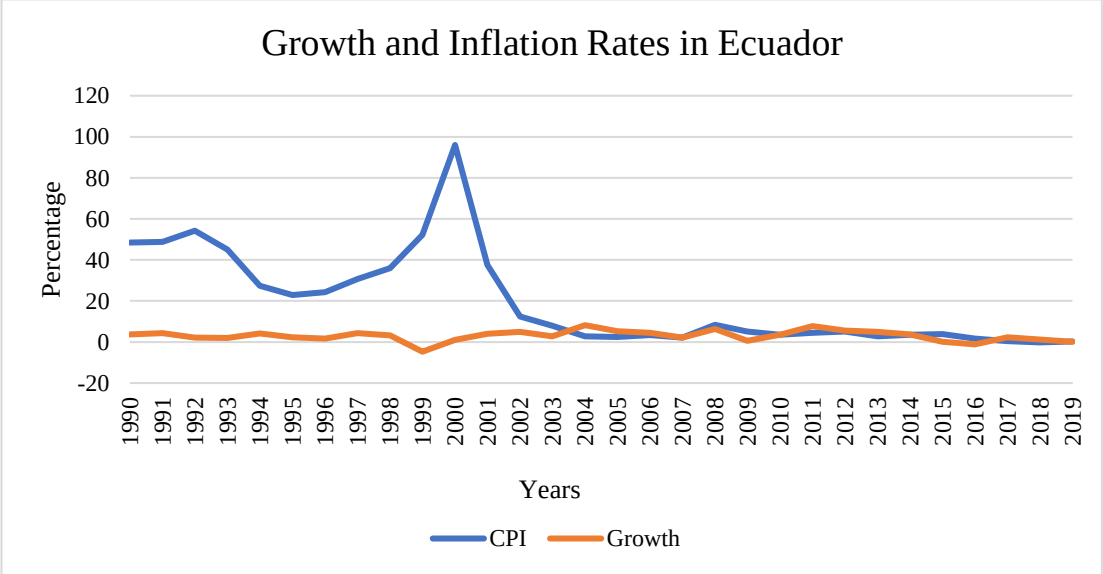
Ecuador

At the beginning of the 2000s, Ecuador made the transition to the US dollar by changing its local domestic currency completely. After the economic crisis in 1999, the local currency was utterly abolished, and the US dollar began to be used (i.e., full dollarization). Due to full dollarization, an independent monetary policy cannot be

implemented in the country. The economy is dependent on foreign exchange inflows and foreign investments. Moreover, the decline in oil prices since 2014 has seriously affected Ecuador's economy because oil contributes to a large percent of its GDP. (Ministry of Commerce of Republic of Turkey, 2019)

According to a study conducted by Moran in 2016, inflation was very high in Ecuador in the 1990s and even the 1980s. With the conversion to full dollarization, significant decreases were observed in inflation. Starting from the beginning of the 2000s, a steady decline in inflation was observed. At the same time, there has been a significant decline in interest rates in the country. In other words, dollarization has had positive effects on the macroeconomic aspects in this country. Although the majority thought that dollarization would be harmful to the country's economy, it is clear that it brought about stability. One of the essential benefits of full dollarization was the increased confidence in banks and the banking sector. However, the Central Bank has lost some of its important functions as it could not print dollars (Anderson, 2016).

Figure 3: Growth and Inflation Rates between 1990-2019 in Ecuador



Resource: Authors own calculations used (Data from: World Bank, 2020)

In 2000, pre-dollarization inflation was relatively high. Inflation has declined, with the dollar being the legal tender. Since 2003, inflation has not exceeded 5%. However, a stable growth rate could not be achieved even after dollarization (Figure 3).

El Salvador

El Salvador, the smallest country in Central America by area, is the fourth largest economy in the region (The Foreign Ministry of the Republic of Turkey, 2020). It was officially dollarized in January 2001.

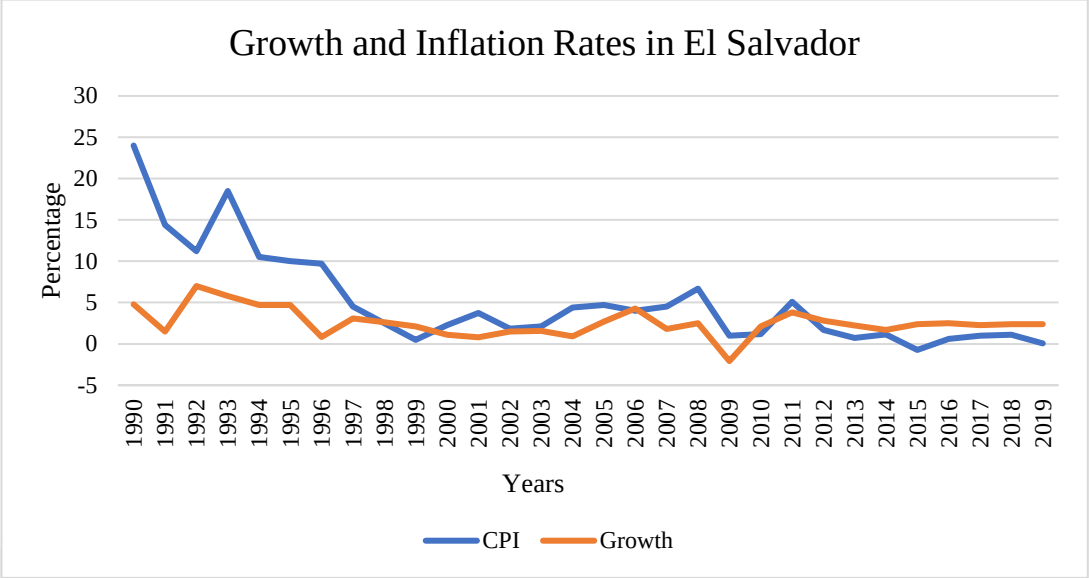
According to Fischer (2001), the dollarization process in El Salvador is different from that in Ecuador. Ecuador has chosen the way of dollarization as a last resort. On the other hand, El Salvador, based on the example of Ecuador, experienced a dollarization process that focused on success in the banking sector.

The El Salvador colon was fixed at 1 US $ = 2.5 colons for fifty years without depreciating in the 1980s. In 1992, it was fixed at 8.75. Before the 1994 Mexican Crisis, the El Salvador government considered switching to the currency board system, but in 1995 they announced that they were planning to dollarize officially. However, this decision was postponed, and in January 2001, the dollar started to be used as the official currency. First, wages, prices, financial accounts, and transactions were converted into US dollars, and within a few years, the colon was removed entirely from circulation (Swiston, 2011).

El Salvador's economy grew by 6.85% between 1992-1995. While inflation was 18.5% in 1993, it dropped down to 5% in 1999. Although high inflation is typically shown as the main reason behind dollarization, the situation is different in El Salvador. Inflation was actually decreasing in the country before full dollarization. The main reason for dollarization in El Salvador is thus not high inflation but to secure trade and investment connections (Chai and Yue, 2019). After dollarization, interest rates, inflation, the poverty level, and inequality have declined (Moran, 2016).

El Salvador's economy grew by 7.2% in 2008 with the structural reforms that included dollarization in 2001, the increased oil prices and foreign workers' income, and diversification of export products (Republic of Turkey-Foreign Economic Relations Board, 2015).

Figure 4: Growth and Inflation Rates between 1990-2019 in El Salvador



Resource: Authors own calculations used (Data from:World Bank, 2020)

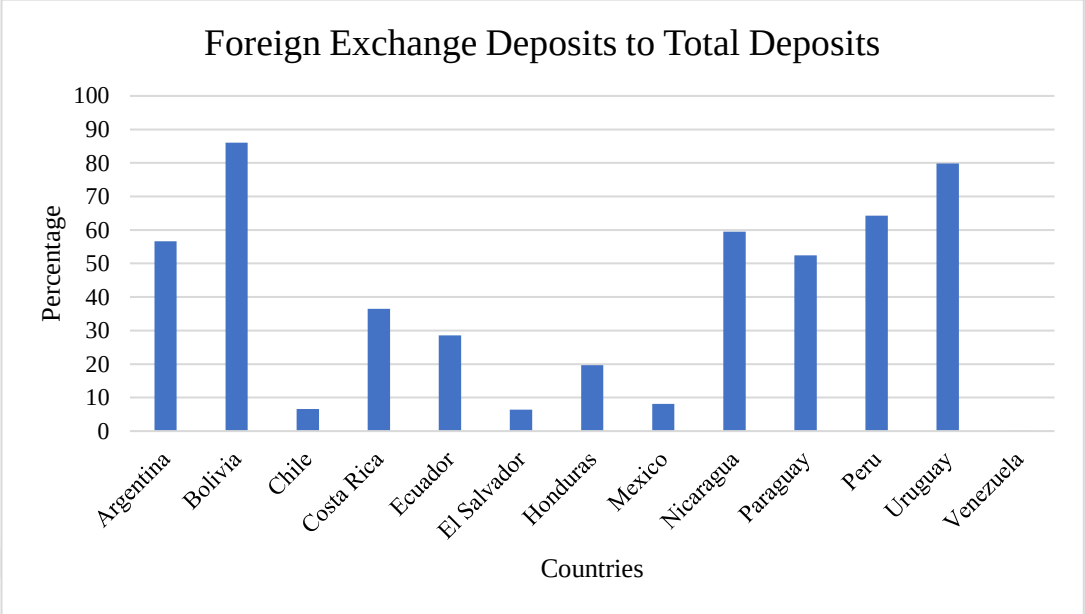
After 2011, growth in El Salvador has become stable. Inflation fell to single digits, and even deflation was experienced in 2015 (Figure 4).

3.1.2. Partial Dollarization

According to Quispe-Agnoli (2002), many Latin American countries have made US dollars their official currency. Panama (1904), Ecuador (2000), El Salvador (2001) are examples of countries where official currency substitution took place. Currency change was adopted to increase economic stability and growth. However, although it provided economic stability in the short term, it caused structural problems in the long run. Since the 1970s, Latin American countries have also experienced partial dollarization due to economic instability and high inflation.

Ecuador and El Salvador changed their currencies due to economic problems and started to use the US dollar as legal tender. On the other hand, for the two major Latin American economies, Brazil and Mexico, full dollarization was out of the question (Chai and Yue, 2019). Full dollarization has not been a 'way out' for other Latin American countries. However, partial dollarization is relatively high in these countries.

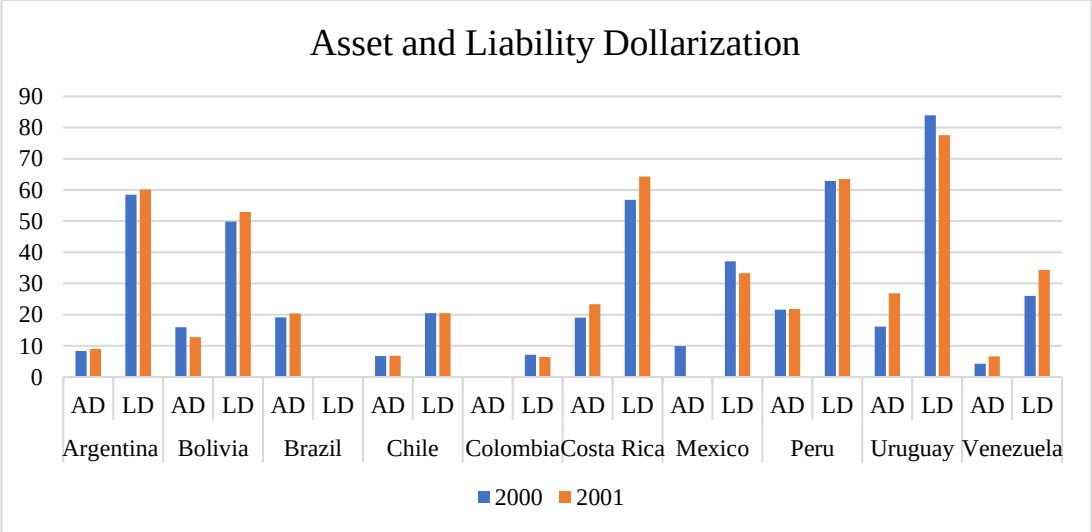
Figure 5: Asset Dollarization in Latin America (1990 and 2001)



Resource: Nicolo et al. (2005)

Nicolo et al. (2005) focused on the ratio of *FXD/total deposits* between 1990 and 2001. The highest asset dollarization was observed in Bolivia. Asset dollarization is below 10% in Chile, Mexico, and Venezuela (Figure 5).

Figure 6: Asset and Liability Dollarization in Latin America (2000 and 2001)



Resource: Kamil, 2004

Kamil (2004) conducted a study measuring the asset and liability dollarization for the Latin American countries. Looking at Figure 6 it is seen that the main problem in this region is liability dollarization. Although asset dollarization is high, it is not as

high as liability dollarization. Liability dollarization has exceeded 50%, especially in Argentina, Bolivia, Costa Rica, Peru, and Uruguay (Figure 6).

Table 3: Partial Dollarization in Latin American Countries

Highly Dollarized	FXD/TD	Less Dollarized	FXD/TD
Bolivia	90	Brazil	6,4
Dominican Republic	25,7	Chile	11,5
Honduras	33,4	Colombia	0,7
Paraguay	61,5	Mexico	7,1
Peru	70,1	Venezuela	0,2
Uruguay	86,1	Guatemala	8,3
Costa Rica	48,3		
Nicaragua	70,3		

Resource: Rennhack and Nozaki, 2006

According to Rennhack and Nozaki (2006), between 2000 and 2004, Bolivia, Dominican Republic, Honduras, Paraguay, Peru, Uruguay, Costa Rica, and Nicaragua had high asset dollarization. On the other hand, Brazil, Chile, Colombia, Mexico, Venezuela, and Guatemala were less dollarized economies (Table 3).

Table 4: Composite Indexes of Latin American Countries[3]

Country	Composite Index	
Ecuador	25	Very high
Bolivia	22	Very high
Uruguay	21	Very high
Argentina	20	Very high
Nicaragua	17	Very high
Peru	16	Very high
Paraguay	15	Very high
Costa Rica	9	High
El Salvador	9	High
Brazil	7	Moderate
Chile	7	Moderate
Guatemala	7	Moderate
Venezuela	6	Moderate
Mexico	5	Moderate
Colombia	5	Moderate

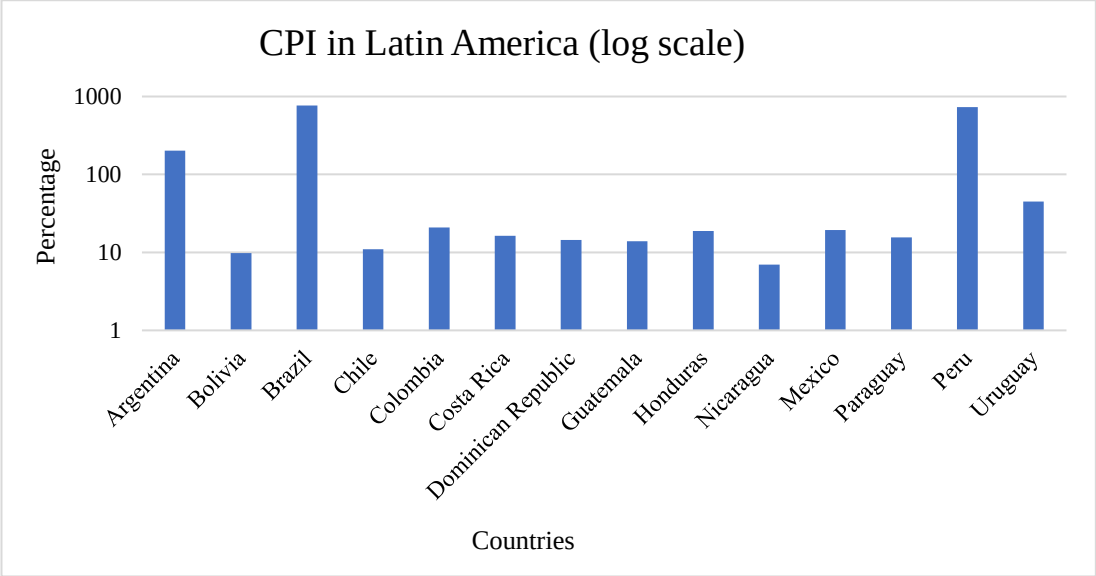
Resource: Reinhart et al. (2014)

[3] The composite index is a combined index that includes both asset dollarization and liability dollarization created by Reinhart, Rogoff and Savastano.

Reinhart et al. (2014) calculated the dollarization rates of many emerging economies for the period of 1996-2001 using a composite index. They included fifteen Latin countries in their study and calculated that seven had very high dollarization rates (Table 4).

As mentioned before, the main reason behind the high financial dollarization observed in Latin America is very high inflation rates. Hyperinflation has been experienced from time to time in Latin America. Inflationary periods exceeding 2000% were realized in the region. For example, in 1990, the inflation rates skyrocketed to 2078%, 2947%, and 7481% in Argentina, Brazil, and Peru, respectively. What is more interesting is that Latin American countries have also experienced deflation from time to time. The inflation rate was recorded as -3.5% in 1993, only three years after the hyperinflation in Argentina. In short, the main problem in Latin American countries is that they have very volatile inflation rates.

Figure 7: Average Inflation Rates between 1990 and 2000 in Latin America[4]

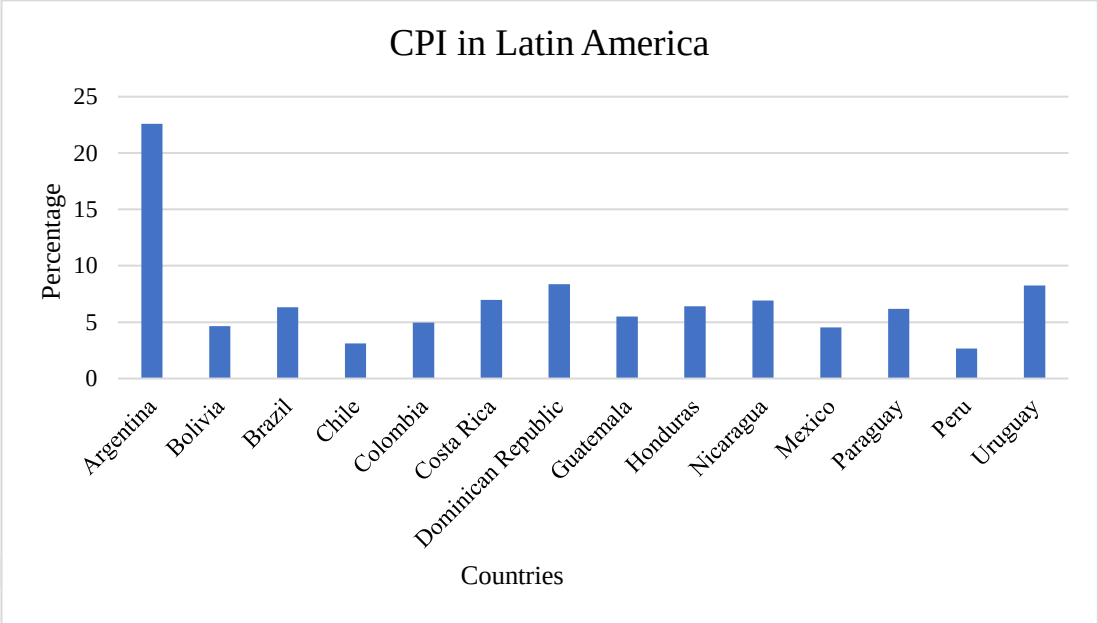


Resource: Authors own calculations used (Data from: World Bank, 2020)

As seen in Figure 7, between 1990 and 2000, inflation in all Latin American countries except Nicaragua was over 10%.

[4] The data for Argentina are calculated using the GDP deflator. Venezuela inflation data are not used in the chart because of insufficient data.

Figure 8: Average Inflation Rates between 2001 and 2019 in Latin America[5]



Resource: Authors own calculations used (Data from: World Bank, 2020)

After 2001, inflation rates have been brought under control to some extent, except Argentina. Although the 2001 economic crisis that Argentina experienced was the main reason behind this, Argentina's inflation is still relatively high today. The other thirteen Latin American countries' average inflation rate is in the 0-10 band (Figure 8).

By the end of the 1980s, average inflation in Latin America rose to 500%. High and volatile inflation patterns hampered macroeconomic stability and growth. Many Latin American countries have implemented exchange rate-dependent stabilization policies to reduce inflation rates. For example, Argentina has adopted the currency board system, while Brazil and Mexico have adopted the crawling peg exchange rate system. In these countries, inflation has dropped impressively. Countries such as Chile, whose inflation was not very high, have adopted more flexible policies by maintaining exchange rate flexibility. At the end of the 1990s, inflation in the region fell below 10%. Even if exchange rate-based stabilization programs were not sustainable, they managed to reduce inflation permanently (Singh et al., 2005).

[5] Argentina data are calculated using the GDP deflator.
Venezuela inflation data are not used in the chart because of insufficient data.

Table 5: Exchange Rates Regimes in 1990s in some Latin American Countries

Exchange Rate Regime	Country	Years
Hard Peg	Argentina	1991-2001
	Brazil	1994-1998
	Uruguay	1990-2001
	Mexico	1988-1994
Soft Peg	Ecuador	1992-1998
	Paraguay	1989-2001
	Venezuela	1989-2002
Inflation Targeting	Chile	Since 1989
	Colombia	Since 1991
	Peru	Since 1993

Resource: Singh et al., 2005

As seen in Table 5, Argentina, Brazil, and Mexico implemented hard peg exchange rate regimes in the 90s and managed to reduce inflation.

Argentina

In Argentina, which had a very bright economy in the past, partial dollarization continues today. However, when compared to the past, the dollarization rates are relatively lower today. By looking at the period between 1980 and 2019, one can observe that asset dollarization peaked during the 2001 crisis (BCRA, 2020).

To date, several studies have investigated dollarization in Argentina. Much of this literature paid particular attention to Argentina's currency board experience. The peso continues to be used in Argentina after the collapse of the currency board due to loss of seigniorage income, the need to gain monetary policy control, and nationalism. Daniel (2001) developed two models to analyze the causes of dollarization in Argentina for the period January 1991 and December 2000. In the first model, Daniel used the *dollar deposits-money* ratio to measure dollarization. However, this measure did not give healthy results due to the inflation stagnation experienced in the 90s. Thus, Daniel included the real interest rate in model 2 and used the *dollar deposits-peso deposits* ratio to measure dollarization. As a result, a positive relationship between the

interest rate and dollarization was found. The increase in dollar interest rates caused an increase in dollarization. Daniel has also shown that there may be interest rate hysteria in Argentina. In other words, high-interest rates applied for foreign currency in the past had a permanent effect on the current period. However, the determinants of dollarization were inconclusive in the study.

In the study conducted by Kamin and Ericsson in 2003, the authors tried to measure dollarizationin Argentina. First, the authors utilized the *dollar deposit to M3 (peso)* ratio to measure dollarization for the period from 1985 to 1993. This ratio increased considerably in the hyperinflation period of 1989-1990. The results showed a close relationship between dollar deposits and M3, and a negative relationship between dollar deposits, inflation, and exchange rate depreciation. Second, the *dollar deposits/total dollar assets* ratio was used to measure dollarization for the 1988 – 1993 period. After 1990, dollar deposits have also increased extensively in Argentina. However, the sum of dollar deposits and dollar currency holdings have increased even more. Despite the very low inflation in raelized 1991 and 1992, the degree of dollarization increased more than ever before. The fall in inflation did not decrease dollarization. This is an indication that there is a Ratchet effect in Argentina.

According to Dabus et al. (2016), residents' confidence in the local currency is lost in high inflation countries. To prevent this confidence loss, long-term price stability should be maintained in such countries. In the empirical study, Dabus et al. used analyzed *dollar deposits/total deposits* for the period 1980 and 2013. The authors found that the Ratchet effect occurred in Argentina in the short term, which triggered partial currency substitution. Devaluation of local currency reduced the demand for money in the future and thus increased currency substitution. Even though the deposit rates increased in the long term, portfolios were kept in foreign currency. The authors concluded that it was difficult for the local currency to reach its old value during periods of high inflation, and therefore, monetary stability must be ensured. It was emphasized in countries like Argentina inflation targeting should be the central bank's main policy.

Marcelin and Mathur (2016) focused on liability dollarization for the 2005-2013 period in Argentina. They calculated the *FC loans/total loans* ratio as 11.23% and *FC*

liability/total liability ratio as 10.09%. Argentina has a relatively low liability dollarization rate among the nineteen countries where the study was conducted.

Bocola and Lorenzoni (2020) calculated asset and liability dollarization using Argentina's 2005-2008 data. *FXD/total deposits* for Argentina was calculated as approximately 8%, while *FC loans/total loans* ratio stood at approximately 12%. Argentina has the lowest asset and liability dollarization after South Africa and Mexico.

Rennhack and Nozaki (2006) published a currency substitution report covering Latin American countries. According to the report, financial dollarization has decreased in some Latin American countries since 2001, and Argentina is one of these countries. The reason for this fall might be the Argentine government forcing residents to return to pesos.

Mexico

Mexico is a Latin American country with low dollarization. According to Rennhack and Nozaki (2006), Mexico is one of the five Latin American countries that has been distant to dollarization despite having experienced severe macroeconomic problems since the 1980s (the other four countries are Brazil, Chile, Colombia, and Venezuela). Nevertheless, studies analyzed the degree of dollarization in Mexico as in the other Latin American countries.

Ortiz (1983) used the *dollar/peso demand deposit* ratio between 1933-1980 to show that devaluation expectation and foreign exchange risk were positively associated with currency substitution. Also, by looking at money demand estimates, Ortiz concluded in his study that there was no relationship between dollarization and foreign interest rates.

Ramirez-Rojas (1985) conducted a study for the period 1970 and early 1980s that included Argentina, Mexico, and Uruguay, which had asymmetric currency substitution. He stated that currency substitution is a new concept for Mexico compared to the other two countries. He used the *foreign currency deposits/total money stock* ratio to measure currency substitution. However, he stated that there was

no distinction between foreign currency deposits of residents and non-residents in the data. Ramirez-Rojas concluded that dollarization in Mexico first started to be a problem after 1975 when the *FXD/total money stock* ratio increased from 4% to 25% in 1975. This study showed a positive relationship between currency substitution and change in exchange rate expectations for all three countries.

Bocola and Lorenzoni (2020) focused on asset and liability dollarization in a study including Mexico. The authors used Mexico's data between 2005 and 2008. According to study, Mexico's *FXD/total deposits* (asset dollarization) rate is 7% and *FC loans/total loans* (liability dollarization) rate is 9%. According to the study, the second country with the lowest asset and liability dollarization is Mexico.

Marcelin and Mathur (2016) focused on the liability dollarization period of 2005 and 2013. They calculated *FC loans/total loans* ratio in Mexico as 12.95%, and *FC liability/total liability* ratio as 10.83%. Mexico is the third country with the lowest *FC liability/total liability* ratio among nineteen countries in the study.

Prock et al. (2003) conducted an empirical study on currency substitution in Mexico, Brazil, and Argentina, covering the October 1986 - June 2001 period. In their study, M1 (real money stock) is used as the dependent variable, while real income, interests on alternative assets, and nominal effective exchange rate are the independent variables. As a result, currency substitution was found higher in Brazil and Argentina than compared to Mexico. The underlying reason for this result was that, after the 1994 crisis, Mexico adopted relatively more successful economic policies. Moreover, Prock et al. claimed that investors did not trust Argentina's economy. The higher the currency substitution, the more sensitive is the country's economy to sudden changes in the exchange rate, productivity, and interest rates. Thus, Prock et al. concluded that these countries should make structural reforms and achieve a sustainable and high growth rate.

3.1.3 De-Dollarization

The lack of trust and financial instabilities created by the past macroeconomic problems cause dollarization to be seen as a solution in Latin America. According to Rojas-Suarez (2003), there are two reasons why dollarization is so much attractive in

Latin America. First is the disappointment of the many hyperinflation and currency crisis periods experienced in the region. So much so that this situation undermines Latin American countries' confidence in monetary and exchange rate policies. In this case, the option of taking away the monetary authority's ability to print money may be considered. Also, as most of the countries in the region are partially dollarized, dollarization becomes the most apparent option. Second is the inability to borrow abroad in domestic currency. This phenomenon is called the 'original sin' by Eichengreen et al. (2005). The lack of a fixed currency that can be used for international transactions causes huge costs in these countries. Although the reserves in the countries are in local currencies, the debts are paid in dollars. This currency mismatch reduces financial stability.

To solve this *attraction* to dollarization, a financial de-dollarization process started in Latin America in the early 2000s. Dollarization decreased with macroeconomic stabilization policies, especially in Peru, Bolivia, Uruguay, and Paraguay (Garcia-Escribano and Sosa, 2011). In fact, Bolivia and Peru had tried de-dollarization in the past but failed. They banned foreign exchange deposits in the 1980s, turning them into local currency deposits and attempting de-dollarization. However, with the increase of hyperinflation and macroeconomic instability, they were again forced to allow foreign exchange deposits. The same practice was followed in Mexico. In 1982 and 1998, foreign currency deposits were forcibly converted into local currency deposits. However, Mexico was successful in de-dollarization with these practices (Reinhart et al., 2014). According to Singh et al. (2005), Brazil, Chile, Colombia, and Venezuela also succeeded in lowering financial dollarization. These countries implemented macroeconomic policies to limit dollarization and restricted foreign currency use in financial transactions with strict regulations.

Cuba is a Latin American country that has an unprecedented place among the Latin American countries when it comes to de-dollarization. After Cuba's independence war in 1898, the US dollar was the only currency used. This situation ended when Cuba minted coins in 1914 and printed paper money in 1934. Over time, the peso began to play a more dominant role in the market, but the use of the dollar continued (Ritter and Rowe, 2003). After the revolution in Cuba, the US dollar's circulation and private property were prohibited due to the problems experienced with

the USA. However, the dollar supply in the country increased with the acceleration of Cuban tourism in the 1980s. Cuba, which had very close trade relations with the Soviet Union, had to legalize the dollar after the collapse of the Soviet Union. The economic crisis that erupted in 1993 caused the dollarization process to begin once more (Posada, 2011).

Nevertheless, the government started to use a bilateral monetary system in 1994 to prevent dollarization. In addition to the Cuban Peso (CUP), a new currency, "Cuban Convertible Peso" (CUC) was adopted. Thus, a de-dollarization process started in the country. (Ritter and Rowe, 2000). CUC replaced the dollar as a legal tender. The use of dollar accounts was still allowed, but dollars in international money transfers were prohibited. In commercial transactions, 1 $ = 1 CUC was used (Herrera and Nakatini, 2004). Besides, transactions in the public sector were realized as 1 CUC = 1 CUP. On the other hand, in the private markets, 1 CUC = 24 CUP parity was used (Republic of Turkey Ministry of Commerce, 2020).

Today, Cuba still uses the dual currency system. However, according to the Cuban government's statement in December 2020, Cuba will abandon the bilateral currency system in 2021.

3.2 Dollarization in Turkey

Turkey's economy is intertwined with the dollarization phenomenon from the past to the present. Dollarization started to take root in the country after the mid-1980s with the start of financial liberalization. Therefore, much of the literature on dollarization in Turkey started in the 1990s.

One of the first studies on dollarization in Turkey belongs to Selçuk (1994). Selçuk created an equation that calculated the dollarization rate in Turkey for the period of 1986-1992. The money supply, central bank monthly average exchange rates, and foreign exchange deposits by residents are used in the equation. As a result of the analysis, it is concluded that there is a positive relationship between dollarization and real depreciation of TL. According to Selçuk's analysis, as dollarization increases, seigniorage income decreases, which can cause high inflation. It is also concluded that currency substitution increases as nominal returns on domestic assets decrease. As

currency substitution increases, Turkey loses its ability to apply independent monetary policy.

Özkaramete (1996) focused on asset dollarization and focused on the *FXD/total deposits* (*TD*) ratio in Turkey. As a result of the analysis, a positive relationship was found between inflation, interest rates, expected exchange rate, money supply, and the FXD/TD ratio. According to Özkarametre, due to the deteriorating macroeconomic factors after 1990, domestic residents turned to the foreign currency instead of TL. In 1995, the rate of asset dollarization surged to 50%.

Akçay et al. (1997) tested the existence of dollarization and its effect on the dollar exchange rate volatility in Turkey for the period 1987:Q1 and 1996:Q3. The results showed a positive relationship between dollarization and exchange rate volatility

Selçuk (2001) focused on the effects of currency substitution on seigniorage income in Turkey. Selçuk attributed high dollarization in Turkey to its higher than the world average inflation rate. He claimed that the government could not get more seigniorage revenue because of high dollarization. A strong stabilization program should be applied to solve this problem, and inflation should be brought closer to world inflation in Turkey. Only in this way can seigniorage income be increased.

Civcir (2003) examined the *FXD/M2Y and FXD/total deposits* ratios for the 1986 and 2000 period in Turkey and showed a positive relationship between asset dollarization and expected exchange rate and exchange rate risk. He determined the two most dominant factors on dollarization as interest rate differential and expected exchange rate. Civcir claimed that if macroeconomic stability is achieved, reverse dollarization (de-dollarization) may occur in Turkey.

Oskooee and Domaç (2003) emphasized the presence of dollarization hysteria in Turkey. Generally, inflation is seen as a variable that affects dollarization. However, Oskooee and Domaç studied the reverse causation running from dollarization to inflation and found that dollarization affected inflation negatively.

Dumrul (2010) used inflation, the expected exchange rate, domestic real interest rates, foreign real interest rates, the level of openness, the central bank's gross foreign exchange reserves to calculate currency substitution in Turkey for the period of 1998:04-2009:02. The expected real exchange rate was found as the leading cause of currency substitution in Turkey. However, the gross foreign exchange reserves of the central bank also affected currency substitution. Even if foreign exchange reserves are a policy tool to protect the foreign exchange markets, keeping the reserves high may mean that the exchange rate risk is high. For this reason, Dumrul states that the central bank needs to pay attention to its foreign exchange reserve policies and should even set a lower-upper limit for foreign exchange reserves.

Hekim's (2008) study also measured dollarization in Turkey using the *FXD/M2Y* ratio for the 1992:01 - 2007:12 period. According to this study, the most critical determinants of dollarization in Turkey are inflation and real exchange rate changes. When inflation increases, economic agents increase their demand for foreign currency in order to avoid inflation. With the depreciation of the real exchange rate, the demand for more valuable foreign currency increases. Therefore, the dollarization rate also increases. This paper concludes that to reduce asset dollarization in Turkey, economic confidence should be restored, and the fight against inflation should continue.

After the 2001 crisis, studies that investigate dollarization inertia in Turkey began to emerge. In their study, Taşseven et al. (2015) analyzed asset dollarization using *FXD/M2Y* ratio for the period running from 2000:01 to 2014:12. The authors showed that the expected depreciation and expected inflation rates create instability in economic units, increasing dollarization. According to Taşseven et al., reducing the dollar's value in the short term is very difficult in Turkey because Turkey has dollarization inertia.

Another study referring to dollarization inertia belongs to Özcan and Us (2007). In their study, they investigated whether de-dollarization took place in Turkey after 2002. The *FXD /M2Y* ratio, which was 60% in the past, decreased to 32% in May 2006. The high growth rates recorded in the economy between 2002 and 2005, and the fall in inflation, have visibly reduced dollarization. However, Özcan and Us stated that

dollarization in Turkey was inertial despite this macroeconomic success. They highlighted the importance of sustainable macroeconomic development for de-dollarization and concluded that macroeconomic success by isolation was not enough. After May 2006, dollarization started to increase again. In April 2007 *FXD/M2Y* ratio was calculated by 37%, proved that dollarization persisted in Turkey. Therefore, de-dollarization is still not a real phenomenon in Turkey.

Bocola and Lorenzoni (2020) stated that liability dollarization in emerging economies, especially after the 1997 Asian crisis, is alarming. Bocola analyzed asset and liability dollarization for a country group between 2005 and 2009, including Turkey. The author used the *FXD/TD* ratio to measure asset dollarization in the countries. He showed that Turkey had the highest asset dollarization rate that stood at 35%. On the other hand, liability dollarization was calculated using the *FC loans/total loans* ratio. Bocola using this measure, calculated a 25% liability dollarization rate for Turkey. Turkey is the second country after Russia that has the highest liability dollarization rate.

Similarly, Marcelin and Mathur (2016) focused on liability dollarization in 19 countries. Using the *FC loans/total loans* ratio, the authors calculated liability dollarization to be 25.65% in Turkey. The same study calculated the ratio of foreign exchange liabilities within the total liabilities as 40.63%.

According to Feridun (2012), liability dollarization causes fears of floating. If there is debt dollarization in the banking sector, the country's central bank does not want exchange rates to fluctuate a lot. Feridun showed that liability dollarization causes exchange market pressure, but the reverse does not apply. He stated that a limit should be placed on foreign currency loans to limit the risks of currency mismatches.

Another liability dollarization study was done by Karamollaoğlu and Yalçın (2020). Karamollaoğlu and Yalçın focused on the relationship between liability dollarization and exports. The authors stated that although liability dollarization threatens financial markets, it can also help and support exports. This is because exporters' liability dollarization ensures that the revenue and cost in exports are the

same. Also, they indicated that the only thing that provides export financing in Turkey is liability dollarization.

Çufadar and Özatay (2016) looked at liability dollarization from a different perspective and focused on public debt. They analyzed the public debt to GDP ratio of the emerging economies within the G-20, especially during the recessionary periods. Turkey's public debt share in GDP increased to 72% in May 2001 (28% of this 72% rate is in foreign currency.) In fact, considering the 2001 crisis, this is not too surprising. However, according to Özcan and Us (2009), although asset dollarization increased in Turkey before the 2001 crisis, it decreased after the crisis. Nevertheless, Turkey's banking sector saw external financing as an opportunity after the increase in global liquidity and the resulting surge in capital flows to emerging economies. Thus, offshore dollarization increased. The increase in offshore dollarization, in turn, caused asset dollarization to increase.

Alp and Yalçın (2015) emphasized that the reforms taken after the 2001 crisis and the adoption of a flexible exchange rate regime caused a decrease in inflation and ensured macroeconomic stability. However, despite this, large export companies continued to borrow in foreign currency. Kesriyeli et al. (2011) emphasized that Turkish firms' foreign liabilities are incredibly high compared to their foreign counterparts.

Özsöz et al. (2015) emphasized that Turkey's growth rate was high for the 2003-2009 period despite the increase in domestic and foreign currency loans. In the same study, the authors also stated that foreign currency deposits are the driving force for foreign currency loans. Additionally, as loans in domestic currency increase, foreign currency portfolio decreases as well.

Çağlayan et al. (2019) mentioned that commercial banks' exposure to high exchange rate risk could have serious adverse effects on the financial system in the face of a significant depreciation. In such a situation, the central bank and the government should step in to maintain financial stability. However, they also claimed that this might not be enough in an environment where central bank independence is

continually questioned. In other words, the banking system in the country could collapse with any political or financial shock.

Unlike other studies, Park and Son (2020) focused on the relationship between dollarization and exchange rate regimes. In a study conducted on twenty-eight countries, the authors found no relationship between the exchange rate regime and dollarization. However, the choice of exchange rate regime can affect the degree of dollarization. According to the study, Turkey is a country that has adopted the floating exchange rate regime and still highly dollarized.

CHAPTER 4

A CASE STUDY OF THREE COUNTRIES: TURKEY, ARGENTINA, AND MEXICO

As mentioned in Chapter 3, dollarization is a common problem in Latin American economies. Also, partial dollarization is observed in Turkey since 1980.

This chapter will compare Turkey's dollarization experience with that of two Latin American economies, Argentina, and Mexico. Argentina is chosen as a case study because it is a country that does not prefer full dollarization despite many economic problems and currency board application in its past. Mexico, on the other hand, is a country that has adopted inflation targeting like Turkey and has usually practiced de facto pegs or managed floating exchange rate systems. We will first discussi Turkey, Argentina, and Mexica's economic situation from a historical perspective. Special attention will be given to these countries' asset dollarization ratios since it is the eldest and most commonly used measure of dollarization. Second, the asset and liability dollarization ratios in these countries will be compared along with the exchange rate regimes adopted.

4.1 Turkish Economy: A Historical Perspective

When we speak of the history of financial dollarization in Turkey, we must first talk about the period before 1980. 1980 is an important date for the Turkish economy because financial liberalization started after 1980 in Turkey and caused economic policies to change radically. Besides, Turkey has made the transition to an open economy in 1980.

4.1.1 Pre-1980 Period

In the year it was first founded, the Republic of Turkey had inherited a massive amount of debt from the Ottoman Empire. After the Ottoman Empire collapsed, which could not industrialize, a process of economic change started. It was necessary to create a firm and strong economic structure to ensure Turkey's political independence. However, industrialization did not occur in the country, and savings were insufficient (Boratav, 2003).

The decisions taken at the First Izmir Economic Congress held in 1923 were very important for the Turkish economy. As a result of the decisions taken, industrialization, exportation, and Westernization were given a priori importance. In order to realize economic development, it was decided that foreign capital should enter the country. However, capital did not flow from foreign countries. Thus, liberal thought was adopted to ensure economic development, and the private sector was considered to provide capital. However, the private sector did not have enough capital and this also prevented industrialization. At the same time, İşbank was established to improve the financial system in the country (Boratav, 2003)

Turkey adopted the concept of statism in 1929 with the Great Depression (Eroğlu, 2007). With the great depression, Keynesian economic policies started to be implemented all over the world. Turkey also implemented such policies based on the public sector during this period. This statist approach has put the private sector in the background.

In 1930, the Central Bank of the Republic of Turkey was founded, and Turkey started to print its own money. Besides, an institution emerged to guide monetary policy. The same year, the Law on Protection of the Value of Turkish Currency was enacted. The relationship between TL and foreign currency exchange (i.e., inflow and outflow) was taken under control with this law (Eğilmez, 2018a).

After the 1929 Great Depression, in the year 1930s, the return to the statist policies was held in Turkey. The statist policy adopted was maintained until the last years of the Second World War. In 1930, the Central Bank of the Republic of Turkey

was founded. In 1934, the First Five-Year Industrial Plan was implemented. Facilities[6] that made up the industrial sector's infrastructure were established in this period. With the impact of the plan's success, preparations for the Second Five-Year Industrial Plan started. However, this second plan also could not be implemented due to the Second World War (Eğilmez, 2018a). The war has affected Turkey as well as the entire world.

Turkey became a member of the IMF and World Bank in 1947. In the 1950s, Turkey started to adopt more liberal economic policies. With the introduction of the Marshall Plan, mechanization started in agriculture, and increasing credit opportunities expanded the money supply. Although the liberalization process had positive economic results initially, monetary expansion caused inflation (Eğilmez, 2018a). By 1958, a major economic crisis occurred in the country due to large budget deficits, which increased inflation and imports.

In the 1960s, due to political turmoil in the country, 'statism' was again adopted. As a result of the 1960 military coup, the constitution was changed. During this period, planning came to the fore and the State Planning Organization was established. Meanwhile, the "First Planned Development Period" was initiated. In the late 60s, the second development plan came into force. (Boratav, 2003).

Five-year development plans continued in the following years but with no success due to political reasons (1974 Cyprus Peace Operation and oil crisis).

In the period before 1980 because of the absence of an external financial system, we cannot talk about a dollarization process for Turkey. .

4.1.2 Post-1980 Period

As mentioned previously, the year 1980 carries great importance for the Turkish economy. In the 1980s, Turkey implemented neoliberal economic policies and liberalized its financial system. Also, the country switched to an open economy model.

[6] Etibank, General Directorate of Mineral Research and Exploration, Kayseri and Ereğli Cloth Factories, Nazilli Basma Factory, Malatya Cotton Weaving Factory, Bursa Merino Wool Factory, Gemlik Silk Weaving Factory, Izmit Paper Factory, Şişe-cam, Paşabahçe, Gemlik Artificial Silk Factory and Karabük Iron and Steel Factory

Privatization and liberalization came to the forefront of the economy. In the same period, globalization started in the world.

At the beginning of the 1980s, structural reforms were made in the economy, and an open economy policy was adopted. According to Yavaş (2007), in the 1970s, the economic liberalization movement started in the world. This economic liberalization movement led to the 'January 24 Decisions' and began a new era in Turkey. With the "January 24 Decisions", the restriction on the free use of foreign exchange started to be abolished (Çatık, 2005).

In those years, Turkey was struggling with very high inflation rates. Inflation even surged to 107% in 1980. With the January 24 decisions, public expenditures were restricted. The main aim of these decisions was to fight high inflation. The program caused interest rates to increase. Besides, export earnings and export credits were exempted from taxes. With these measures, foreign trade volume increased in the 1980s, and significant foreign capital inflows occurred (Karaçor and Alptekin, 2006). The January 24 decisions aimed to achieve external balance through export growth (Ataç, 1999).

Up to 1981, Turkey had applied a fixed exchange rate regime, but in 1981 it switched to a crawling peg exchange rate regime (Özatay, 2000). With this system, exchange rates were determined daily.

Turkey experienced an economic crisis in 1982 due to wrong policies implemented. The effects of this crisis, which arose due to the unsupervised bankers and banks, continued for years. The liberalization of deposit interest rates and the increase in loan interest rates caused this crisis.

In 1984, Turkish citizens were allowed to open foreign exchange deposit accounts and keep foreign currency (1984 Annual Report of CBRT). As shown in Table 6, the amount of foreign exchange deposits (FXDs) has steadily increased after 1986. However, there was a decrease in the rate of asset dollarization in 1989 and 1990. The increase in inflation and inflation expectations in 1988 caused financial imbalance and the demand for foreign currency increased. In order to eliminate this

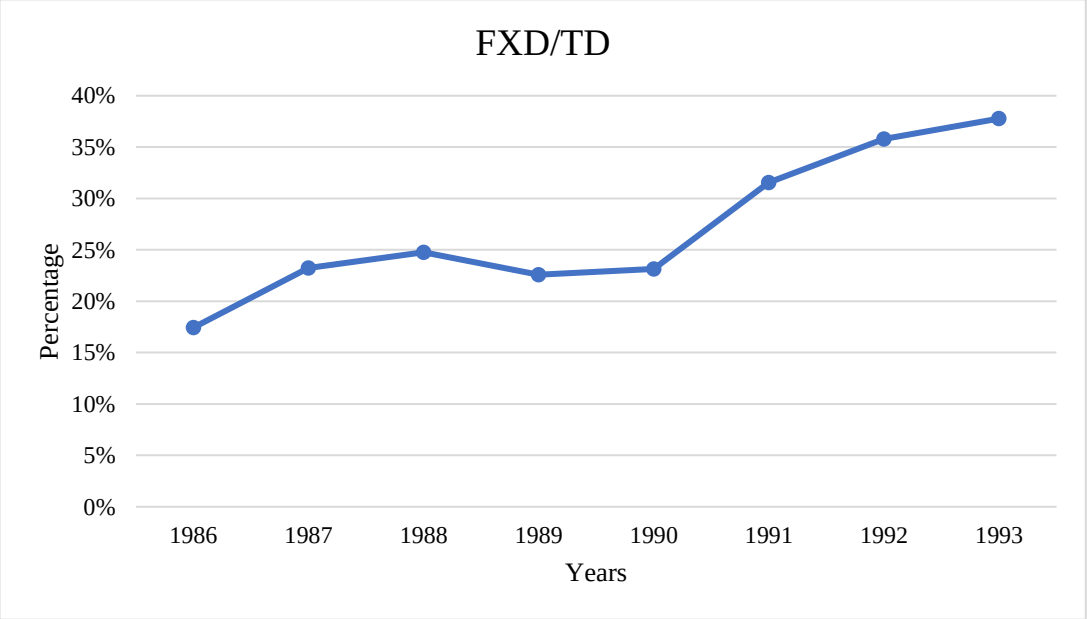
imbalance, deposit interest rates were released and at the end of 1988, deposit rates jumped to 85%. For this reason, individuals turned to TL deposits (Saraçoğlu, 1989), and its share in total deposit accounts (as mentioned in Chapter 2, this is the most commonly used measure of asset dollarization) increased from 17% to 38% in 1993. This increase can be more clearly observed from Figure 9.

Table 6: Asset Dollarization between 1986 and 1993 in Turkey (Thousands TL)

Years	FXD	Total Deposits	M2	FXD/Total Deposits	FXD/M2
1986	2.720	15.595	12.173	17%	22%
1987	5.550	23.898	17.648	23%	31%
1988	9.412	38.013	27.194	25%	35%
1989	13.928	61.648	47.139	23%	30%
1990	21.744	93.931	71.570	23%	30%
1991	51.980	164.669	117.118	32%	44%
1992	106.025	296.151	190.736	36%	56%
1993	197.365	522.500	282.442	38%	70%

Resource: CBRT, 2019

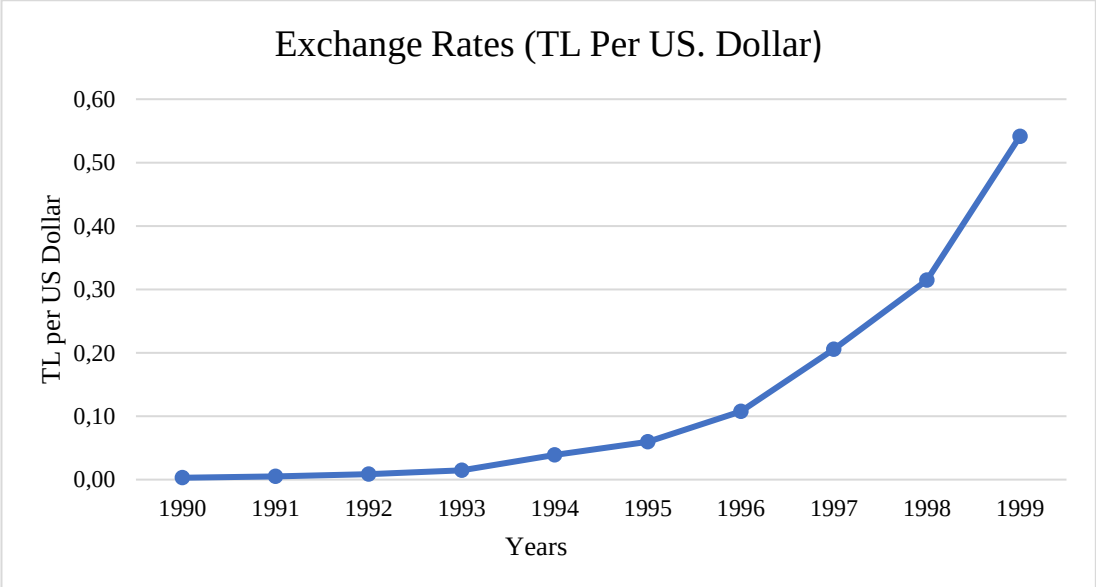
Figure 9: Asset Dollarization between 1986 and 1993 in Turkey



Resource: Table 6

In 1994, foreign trade deficits were covered by foreign credits, and thus, the second economic crisis occurred in the country. According to Yavaş (2007), the 1994 crisis is structurally different from other crises. This crisis emerged rapidly and affected both the financial and real sectors. The main reason for the crisis was the deterioration of the current account balance. With the financial liberalization of the 1990s, the economybecame dependent on short-term capital movements, and hence to external shocks. Turkish Lira depreciated heavily against the dollar. In the first quarter of 1994, the Turkish Lira depreciated by almost 70% against the US dollar. The Central Bank intervened in international reserves in the face of this depreciation and lost more than half of its reserves. Overnight interest rates jumped to 700%. Also, economic growth decreased by 6% in the same period (Özatay, 2000). The CBRT's foreign exchange reserves were further used to improve the current account balance. However, TL continued to depreciate against the dollar as the reserves melted. According to the 1994 annual report of the CBRT, the TL depreciated by 167.6% against the US dollar at the end of 1994. Unfortunately the depreciation in TL accelerated in the last half of the same decade (Figure 10).

Figure 10: Exchange Rates[7] Between 1990 and 1999 in Turkey



Resource: Authors own calculations used (Data from: IFS, 2020)

The government announced a new stabilization program on April 5, 1994, and a stand-by agreement was signed with the IMF to control the crisis. However, it was

[7] The exchange rates used are based on the Turkish Lira used today.

later understood that the government did not comply with the April 5 program, and it was revealed that the program ended in 1995. No attempt was made to reduce inflation and maintain economic stability in the following two years (Ertuğrul and Selçuk, 2003). Starting in 1984, the amount of FXDs increased continuously. With the April 5 decisions, the government aimed to decrease this ratio, but the confidence in TL could not be ensured, and the increase in FXD continued. According to CBRT annual reports, the M2 and M2Y continued to increase for years due to the crisis.

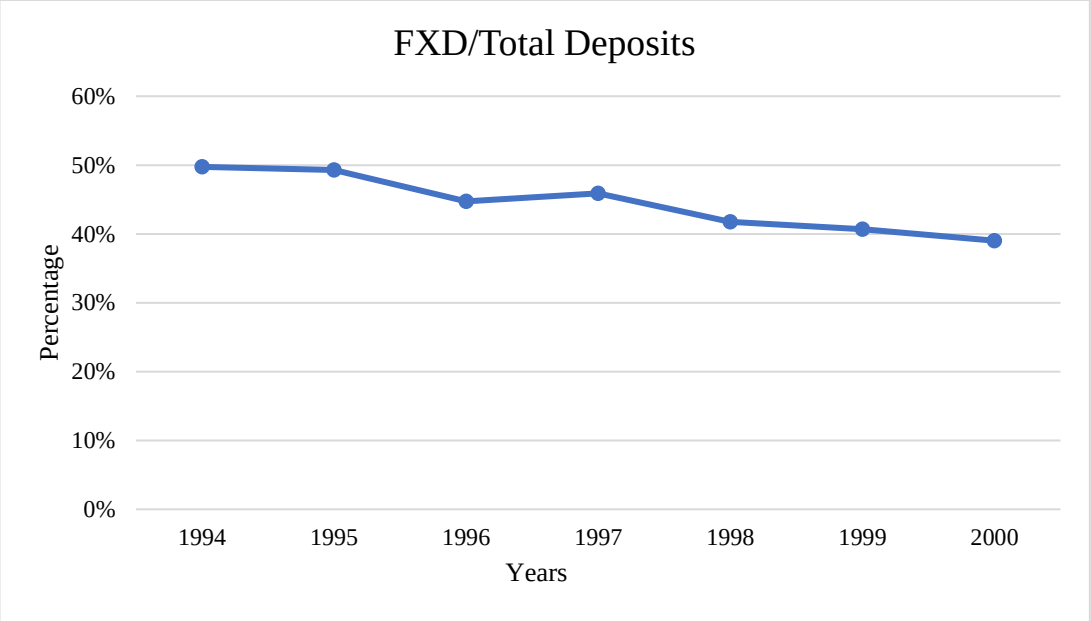
Table 7: Asset Dollarization between 1994 and 2000 in Turkey (Thousands TL)

Years	FXD	Total Deposits	M2	FXD/Total Deposits	FXD/M2
1994	598.478	1.203.149	630.348	50%	95%
1995	1.253.290	2.543.787	1.256.632	49%	100%
1996	2.627.629	5.876.127	2.924.893	45%	90%
1997	5.493.852	11.964.591	5.658.800	46%	97%
1998	9.574.358	22.916.822	11.423.198	42%	84%
1999	18.420.635	45.291.813	22.401.831	41%	82%
2000	25.341.684	64.942.983	31.912.095	39%	79%

Resource: CBRT, 2019

With the economic crisis in 1994, the amount of FXDs increased more than ever. The ratio of FXDs in total deposits increased to 50% in 1994. On the other hand, the ratio of FXDs to M2 surged to 100% in 1995. The biggest reason for this difference is the large increase in the money supply after 1994. The money supply doubled in 1995 compared to the previous year (Table 7). In the following years after the 1994 crisis, the FXD/total deposits ratio decreased (Figure 11).

Figure 11: Asset Dollarization between 1994 and 2000 in Turkey



Resource: Table 7

Although the economy started to recover after the 1994 crisis, with no specific structural and economic reform economic tension increased again at the beginning of 2000. The crises that hit the East Asian countries in 1998 did not affect Turkey at first. However, the crisis deeply affected Turkey's largest trade partner, Russia. Besides, the 1999 earthquake detrimentally increased the government's budget deficit. These negative factors have all contributed to the 2000-2001 crisis (Celasun, 1998).

A letter of intent was presented to the IMF in December 1999 because of increased real interest rates, government debt stocks, and inflation (CBRT Annual Reports, 2001). In January 2000, Turkey began to implement the three-year IMF stabilization program. This program was an exchange rate-based inflation and structural reform program (Alper, 2001). The agreement's main objective was to reduce inflation to single digits and increase the economy's growth potential. The program had three elements: tight fiscal policy practices aimed at increasing the primary surplus, accelerating privatization, and implementing structural reforms; income policy in line with the inflation target; monetary and exchange rate policies focused on low inflation target (CBRT Annual Reports, 2000). With the program, Turkey started to implement a crawling peg exchange rate regime. The exchange rate was allowed to expand and fluctuate within eighteen months after the program was

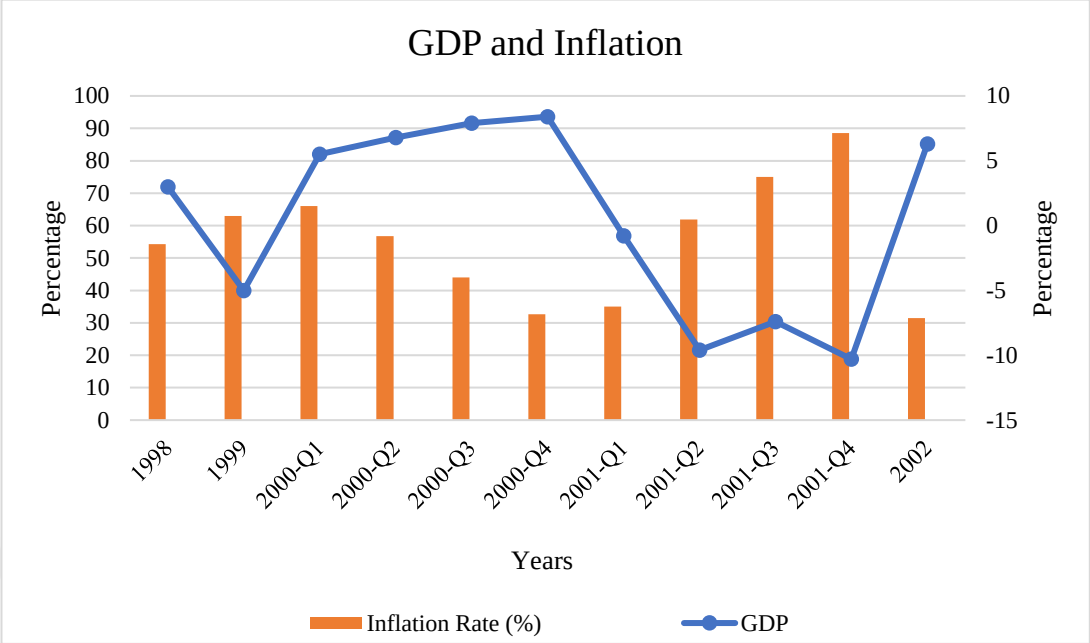
made public (Özatay and Sak, 2002). Nominal interest rates started to decrease as the exchange rate risk disappeared. This development in exchange rates and interests increased investment and imports, and the economy started to grow again (CBRT Annual Reports, 2000).

In the second half of 2000, uneasiness occurred in the domestic and foreign markets due to the failure in realizing structural reforms, deviation from the privatization target, and widening of the current account deficit. This uneasiness led to a decrease in the inflow of capital entering the country. This situation caused an increase in interest rates (CBRT Annual Reports, 2001). The overnight interest rates started to increase in August and September. On November 22, 2000, the interbank market's simple overnight interest increased threefold, and the Central Bank's dollar reserve dropped from $ 24.4 billion to $ 18.9 billion within two weeks. Thus, the foreign exchange reserves determined by the IMF program decreased to the lower limit (Uygur, 2001).

In February 2001, with the incredible surge in the overnight interest rates and the remarkable decrease in the Central Bank's foreign exchange reserves, the exchange rate system collapsed. Thus, the Central bank announced that it would implement a floating exchange rate regime (Özatay and Sak, 2002). ‘Transition to a Strong Economy Program’ started to be implemented in May 2001. Within the scope of the program, "implicit inflation targeting" was determined as the monetary framework in 2002

The solution to the crisis was again sought in the IMF. The crisis was overcome with a stand-by agreement with the IMF. The economic program implemented restored stability in the financial markets.

Figure 12: GDP and Inflation Rate During 2000-2001 Crisis



Resource: Authors own calculations used (Data from: CBRT, 2020)

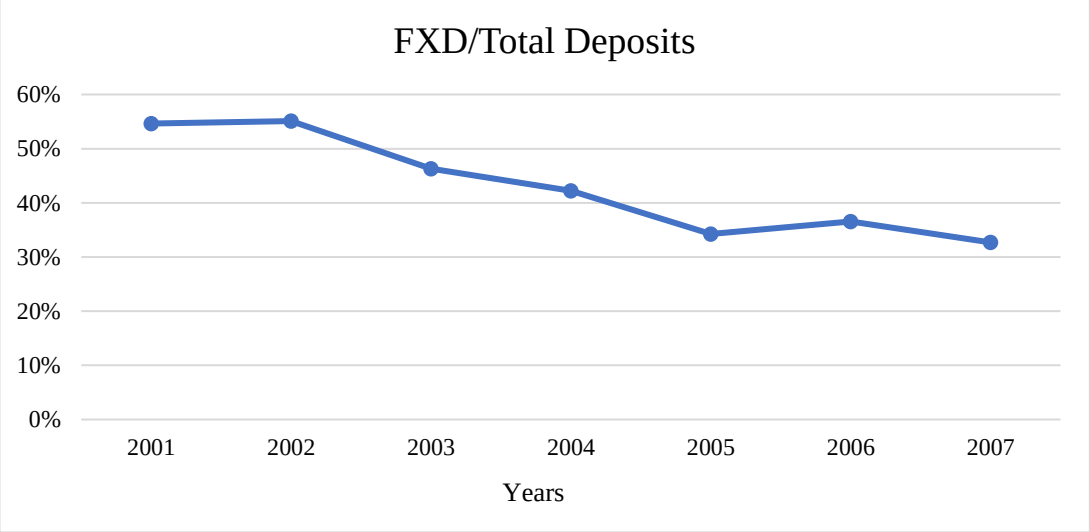
As shown in Figure 12, inflation decreased after the IMF stabilization program until the first quarter of 2001. Simultaneously, the GDP increased in 2000, but this increase only continued until the last quarter of 2000. The Turkish economy contracted %5.7 in 2001. In 2002, growth was restored, and inflation decreased (Figure 12). After the 2000-2001 crisis, Turkey experienced higher and sustained economic growth. An average annual growth rate of 7% was achieved between 2002-2007 (Tiftik, 2020). Turkey has since adopted a more liberal position (Ekinci, 2013).

Table 8: Asset Dollarization between 2001 and 2007 in Turkey (Thousands TL)

Years	FXD	Total Deposits	M2	FXD/Total Deposits	FXD/M2
2001	60.397.916	110.521.576	47.241.075	55%	128%
2002	74.694.153	135.575.188	61.879.759	55%	121%
2003	71.436.743	154.185.095	82.712.966	46%	86%
2004	79.097.516	187.289.520	108.539.246	42%	73%
2005	79.970.225	233.427.879	238.801.377	34%	33%
2006	104.426.133	285.487.831	297.734.742	37%	35%
2007	107.528.626	328.881.376	344.376.752	33%	31%

Resource: CBRT, 2019

Figure 13: Asset Dollarization between 2001 and 2007 in Turkey



Resource: Table 8

As expected, with the 2001 crisis, there was a significant increase in FXDs (Table 8). As aforementioned, with the IMF's stand-by program, the crisis's adverse effects began to diminish in the following years, resulting in a decline in FXD/total deposits ratio (Figure 13).

From January 1, 2005, the currency changed in Turkey. The *new* Turkish Lira was launched after the government removed six zeros from the former Turkish Lira.

This currency change aimed to eliminate the technical and operational difficulties encountered in using the world's most denominated banknotes and reduce inflation to one digit level permanently (CBRT Annual Reports). In November 2006, CBRT officially started to *implement inflation targeting* to combat chronic and high inflation (Eruygur, 2011).

By 2008, the US mortgage crisis erupted. As a result of this crisis, all world economies were affected. The crisis was due to bad performing mortgage loans, which are based on low-income families' homes. The 2008 crisis, which started as a credit crisis, turned into a liquidity crisis and affected all world economies. The 2008 crisis is a financial crisis and a real sector crisis (Kaderli and Küçükkaya, 2012). Developing countries such as Turkey was also affected by this crisis. The main reason was the foreign financing needs of investors in these countries. Over time, the crisis negatively affected the European Union countries as well. Turkey's trade with the European Union was affected as a result and led to a fall in exports of Turkey in 2008-2009 period. Owing to the uncertainty caused by the crisis environment, economic expectations were negatively affected, and investments decreased. Thus, the Turkish economy contracted by 4.7% in 2009 (Engin and Göllüce, 2016).

Some measures were taken against the adverse effects that may occur in the foreign exchange markets due to the crisis. In 2009, the CBRT maintained its floating exchange rate regime. To maintain the healthy functioning of the foreign exchange market, foreign exchange buying and selling auctions were initiated. Foreign exchange selling auctions were held in order to ensure the necessary liquidity in the foreign exchange market. In periods of high foreign exchange supply, foreign exchange buying auctions were held to accumulate reserves. (Annual report of the CBRT, 2009)

Table 9: Asset Dollarization between 2008 and 2019 in Turkey (Thousands TL)

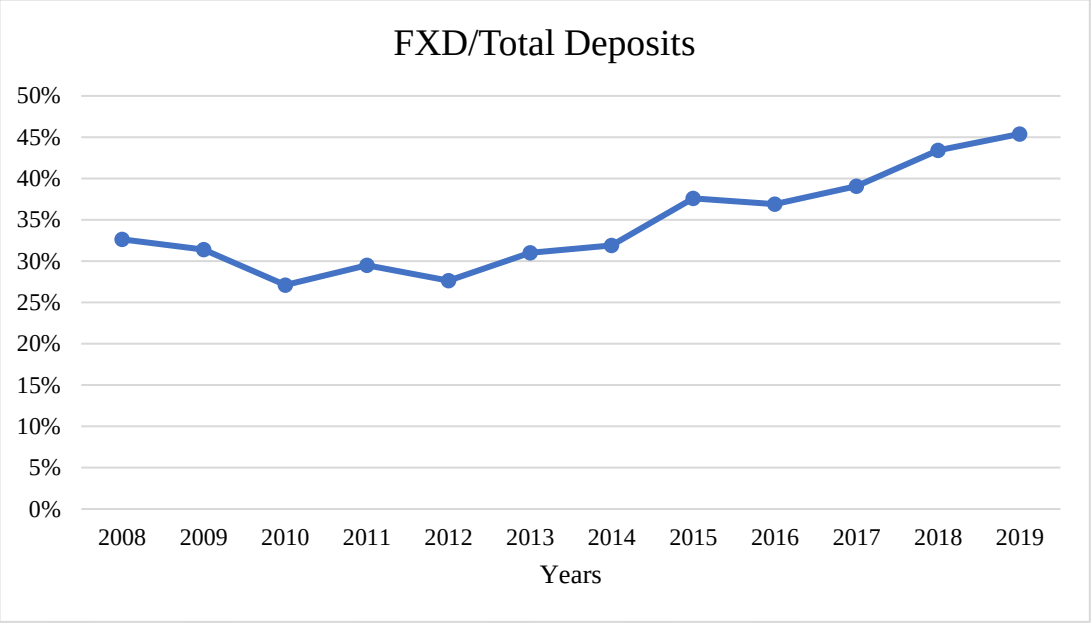
Years	FXD	Total Deposits	M2	FXD/Total Deposits	FXD/M2
2008	135.508.576	415.326.858	436.380.325	33%	31%
2009	145.700.489	463.868.930	493.060.975	31%	30%
2010	150.707.177	555.903.036	587.261.177	27%	26%
2011	190.748.771	646.255.639	674.409.578	30%	28%
2012	198.737.516	718.952.640	743.043.392	28%	27%
2013	272.734.844	879.445.638	908.004.749	31%	30%
2014	316.390.978	992.073.598	1.015.896.401	32%	31%
2015	439.972.232	1.170.461.919	1.189.494.063	38%	37%
2016	512.342.333	1.387.843.961	1.406.871.437	37%	36%
2017	635.626.101	1.627.268.614	1.628.019.167	39%	39%
2018	847.660.201	1.952.951.079	1.939.048.094	43%	44%
2019	1.045.987.331	2.304.232.946	2.343.657.518	45%	45%

Resource: CBRT, 2019

After the 2008 crisis, Turkey's Central Bank has intervened into the foreign exchange market through monetary and fiscal policies. Specific sectors were supported in order to stimulate domestic demand. (Tiftik, 2020).

Since 2008, there has been a steady increase in FXDs, total deposits, and M2. Over the past decade, FXDs have increased by almost 7.5 times (Table 9). As shown in Figure 14, asset substitution rose to 45% from 33% between 2008 and 2019 in Turkey.

Figure 14: Asset Dollarization between 2008 and 2019 in Turkey

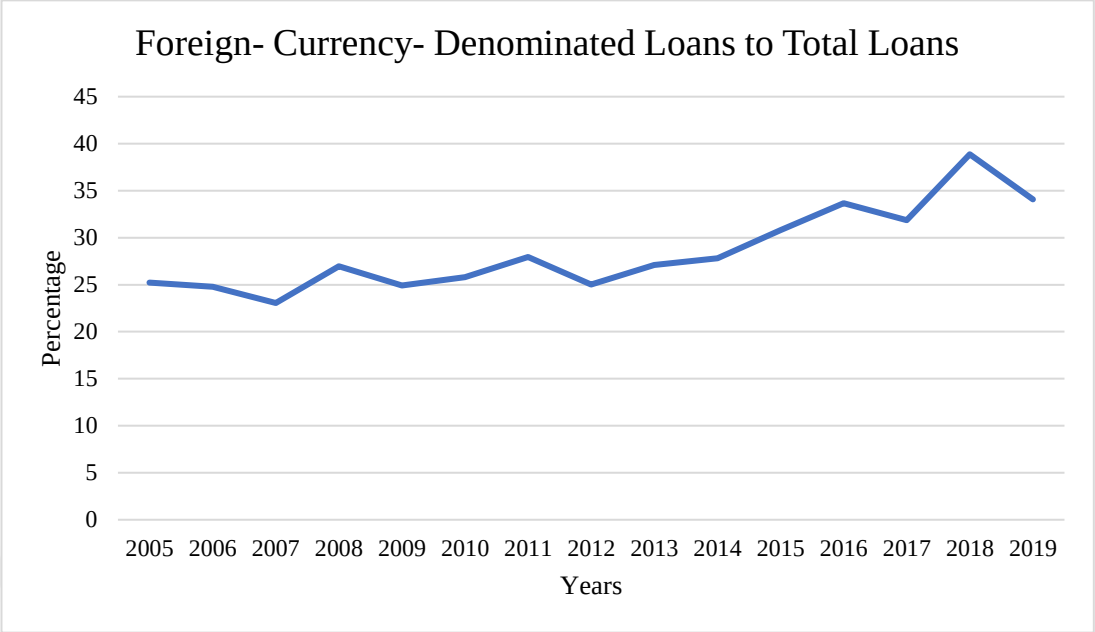


Resource: Table 9

The 2008 global crisis has led to an unprecedented contraction in Turkey. The economy shrank by 14.3% in the first quarter of 2008 (Özatay, 2010). In the same year, the inflation rate was 10.4%. In the following years, until 2017 Turkey has managed to keep inflation in single digits. However, as of 2017, there was an increase in inflation, and the GDP growth rate equalled 7.5 %.

As mentioned in Chapter 2, measuring liability dollarization is difficult due to lack of data. For this reason, credit dollarization measurement is generally used to measure liability dollarization. However, the IMF has been sharing the *foreign currency liability/total liabilities* rate of the countries since the 2000s. Although there are many asset dollarization studies in the literature, there are fewer studies on liability dollarization measurement. Therefore, while measuring liability dollarization, both credit dollarization and liability dollarization measurements were used.

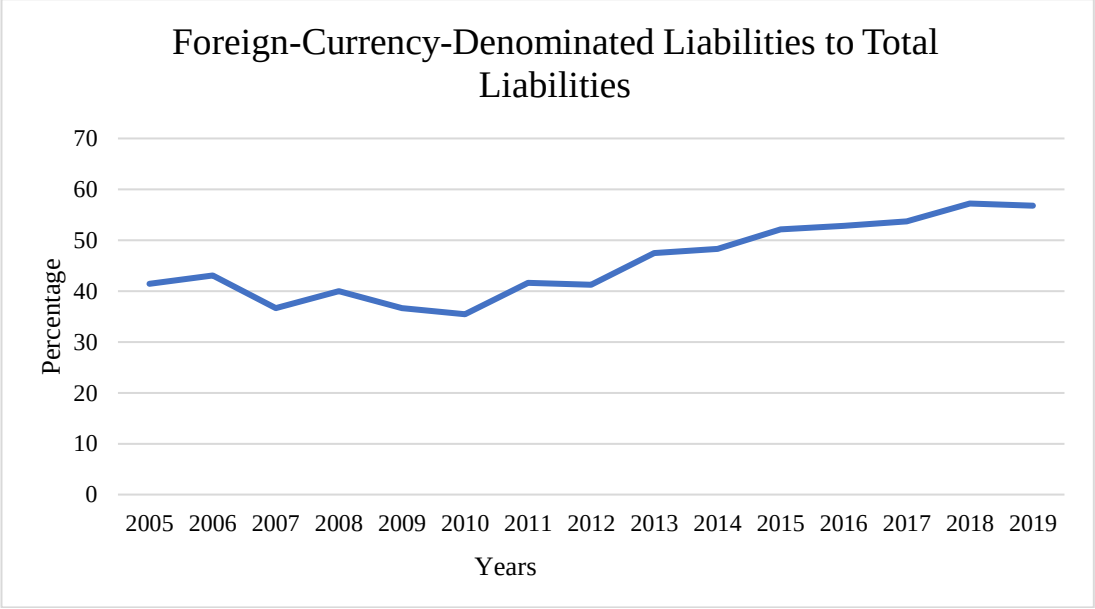
Figure 15: Credit Dollarization between 2005 and 2019 in Turkey



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

Credit dollarization in Turkey was 25% in 2005, and it increased to 39% in 2018. Although, it fell below 35% in 2019 (Figure 15). Credit dollarization is still high in the country. Considering that foreign currency loans have an exchange rate risk, credit dollarization is risky because repayments create a greater burden when the foreign currency appreciates.

Figure 16: Liability Dollarization between 2005 and 2019 in Turkey



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

According to Figure 16, liability dollarization is increasing in Turkey since 2012. In 2019, liability dollarization has exceeded 55%.

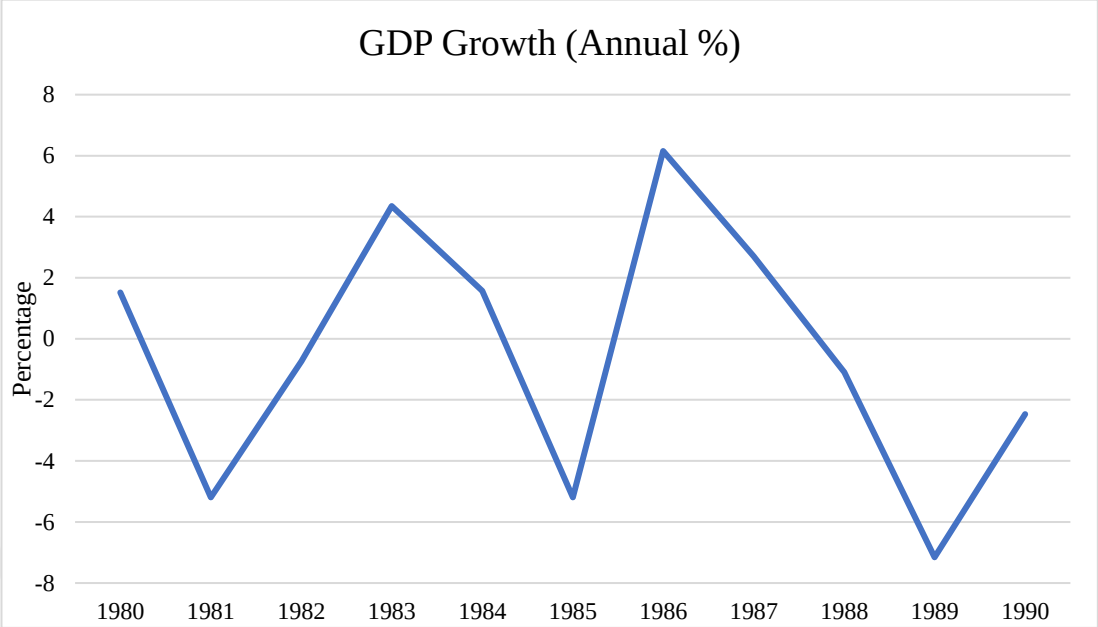
The global financial crisis that occurred at the end of 2008 brought along unusual problems. This has led central banks to use unusually different tools. Developed countries implemented a monetary expansion policy and this situation led developing countries to seek different policies (CBRT, 2013). In the aftermath of the global crisis, central banks should have implemented policies that did not ignore the risks accumulated in the financial system and the increase in asset prices while focusing on price stability (Kara, 2012). In November 2010, CBRT set a financial stability target as well as inflation targeting. In order to ensure financial stability, two intermediate targets were determined: reducing short-term capital inflows and slowing down credit expansion (Özatay, 2011). According to Kara (2016), financial stability was determined as a complementary target. In addition, the Financial Stability Committee was established against financial risks. With these new policies implemented, the exchange rate moved in the desired direction (Kara, 2012).

4.2 Argentine Economy: A Historical Perspective

In Argentina, where inflation is very high, many studies on currency substitution have been conducted. Argentina was one of the ten wealthiest countries in the world in the early 20th century. GDP was at the same level as Canada at that time. Both countries were affected by the 1929 crisis, but Argentina was more severely affected. The main reason for this was Argentina's unstable monetary policies applied since the 1900s. In the following years, instability in the economy continued (Velde and Veracierto, 1999).

Since the 1980s, Argentina has been on the agenda with economic instability. The country implemented many stability programs to cure its chronic and high inflation. As a result of the 1970 OPEC crisis and the 1982 debt crisis, Argentina's economy entered into a recession period at the end of the 1980s (Şen and Demirhan, 2004). In 1989, its GDP shrank by 6.9%, while inflation exceeded 3000% (Quispe-Agnoli, 2002).

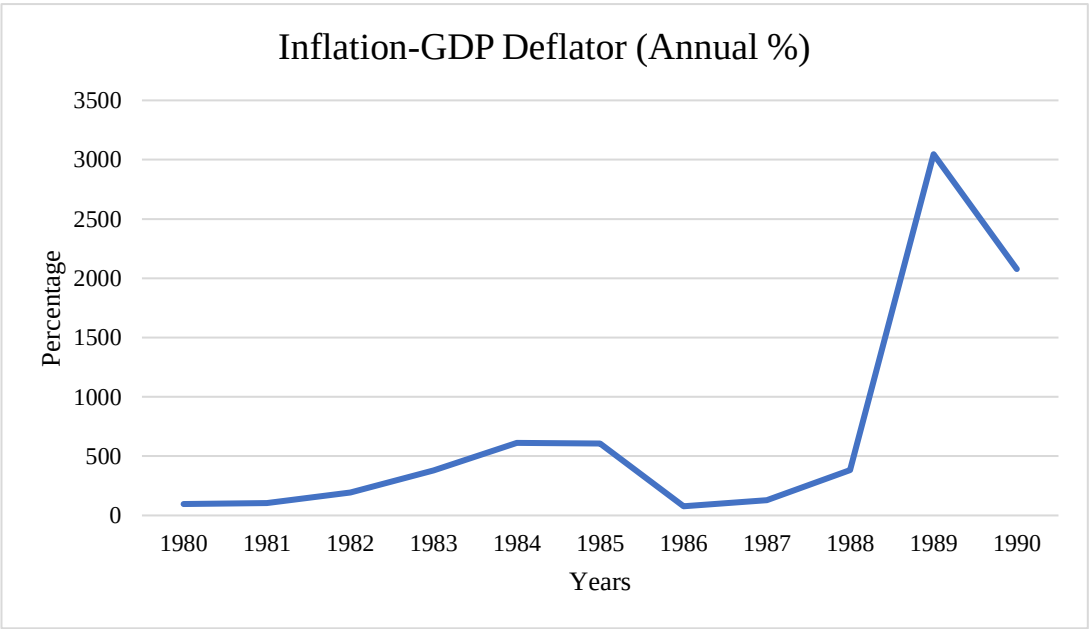
Figure 17: GDP Growth Between 1980 and 1990 in Argentina



Resource: Authors own calculations used (Data from: World Bank, 2020)

Figure 17 shows that between the years 1980-1990, the Argentine economy sometimes grew and sometimes contracted. However, the shrinkage in 1989 was relatively high. Moreover, the inflation rate, which was 95% in 1980, increased to 3046% in 1989, and hyperinflation was experienced in Argentina (Figure 18).

Figure 18: Inflation Rate Between 1980 and 1990 in Argentina



Resource: Authors own calculations used (Data from: World Bank, 2020)

In 1991, Argentina started to administer the Convertibility Plan and the currency board system. The Convertibility Plan's purpose was to regulate the monetary system, reduce inflation, and carry out structural reforms. Under the plan, the Central Bank of Argentina (BCRA) was restructured, and the US dollar was adopted as the reserve currency instead of the national currency Austral. The exchange rate was fixed and determined as 1 US dollar = 10000 austral. In 1992, the peso was used instead of Austral, but the exchange rate regime remained unchanged (1 US dollar = 1 peso).

With the currency board system, inflation fell from 3000% to single digits quickly, and the growth rate turned into positive figures. Inflation was no longer a problem for the country, but the unemployment rate remained high. In other words, this plan could not solve the inherent structural problems (Şen and Demirhan, 2004). Besides, tax revenues decreased, but the budget deficit increased since public expenditures did not decrease (İnan, 2002).

In 2002, Argentina abolished the currency board practice. According to Curutchet (2001), the Convertibility Plan did not provide complete confidence in the exchange rate. Therefore, official currency substitution could be the correct solution for Argentina. With official dollarization, the cost of currency risk and real interest rates might decrease, causing capital flow from the USA to increase.

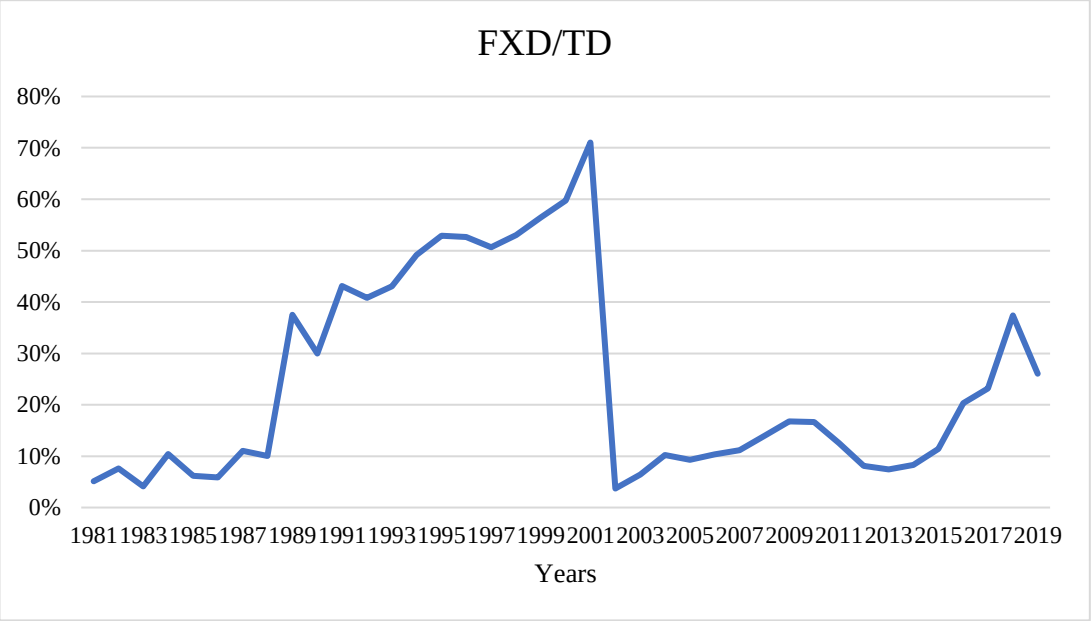
According to Altig and Humpage (1999), in the pure currency board system, the monetary base in the country may change according to the monetary policy of the USA and the change in dollar demand. However, in the currency board system in Argentina, foreign exchange was traded and the monetary base was changed in order to keep the money at a fixed exchange rate. Although the currency board in Argentina established was not a pure currency board , by 1995, inflation approached the US level. Since the structural problems could not be solved, the Argentine economy contracted in the second half of the 1990s.

The 1994 Tequila Crisis, 1997 Asian Crisis, 1998 Russian Crisis, and the 1999 Brazilian Crises had detrimental effects on Argentina's economy. Abandonment of the fixed exchange rate regime at the beginning of the 2000s caused a devaluation of 41% in Argentina. All these have prepared the ground for Argentina's economic crisis in

2001 (Evirgen, 2004). During the fixed exchange rate regime, dollarization was high, and firms had dollar debt. With the devaluation, the debts of the firms increased. Simultaneously, costs increased, and liquidity decreased due to high foreign currency loans and banks' deposits. Thus, Argentina declared a moratorium in 2001 (Vakıfbank Weekly Report, 2015).

In 2001, Turkey and Argentina experienced economic crises that shared significant similarities, including high dollarization, inflation rates, foreign debt ratio, and foreign capital dependency. At the same time, both countries resorted to similar methods in resolving the crisis: IMF programs, financial liberalization, and inefficient privatization.

Figure 19: Asset Dollarization Between 1981-2019 in Argentina



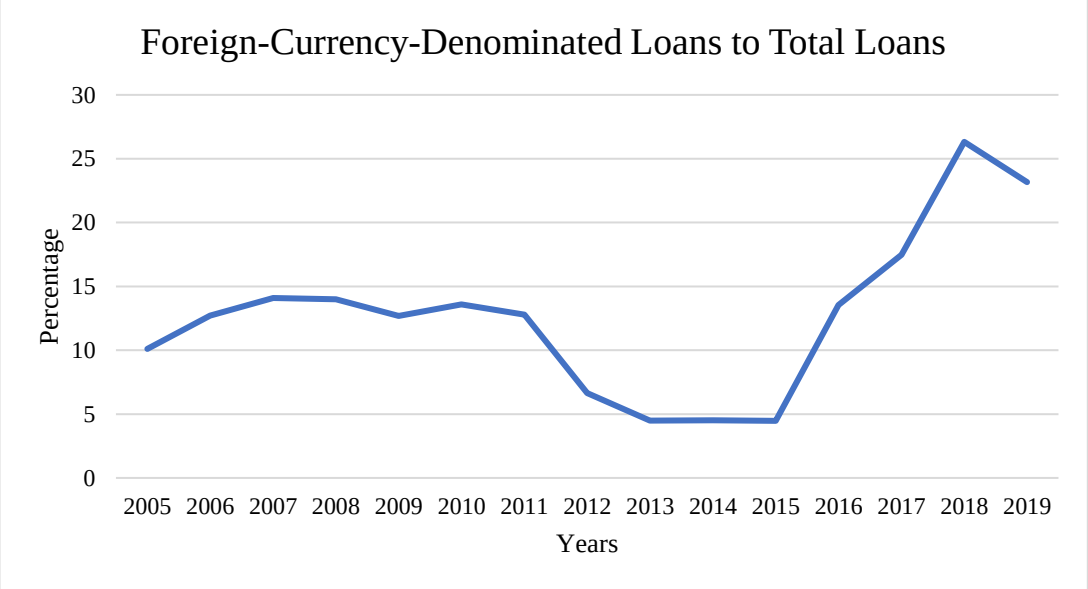
Resource: Authors own calculations used (Data from: BCRA, 2020)

Figure 19 shows that there was a severe increase in asset dollarization in 1989. The biggest reason for this was too high inflation rates. Dollarization continued to increase in the following years. However, due to the 2001 economic crisis, the dollarization rate plummeted. The *FXD/total deposit* ratio rate fluctuated in the following years in the range of 10-20% but increased considerably since 2017 with a fall in 2019.

After the 2001 crisis, the turmoil in Argentina's economy continued for a while. The factors that triggered the crisis in Argentina were the high level of corruption, poor income distribution, high privatization level, and the cartels' negative impact on the economy. Moreover, after the 2001 crises, inflation was very high in Argentina, and it had a large external debt (Evirgen, 2004).

In 2018, Argentina was among the top five countries with the highest inflation rate. In the same year, inflation and the value of dollar doubled. Argentina has been implementing the monetary aggregate target since 2018. Argentina still has high inflation today. In 2019, the inflation rate was 50.6%, and the exchange rate ($/peso) equalled to 59.79.

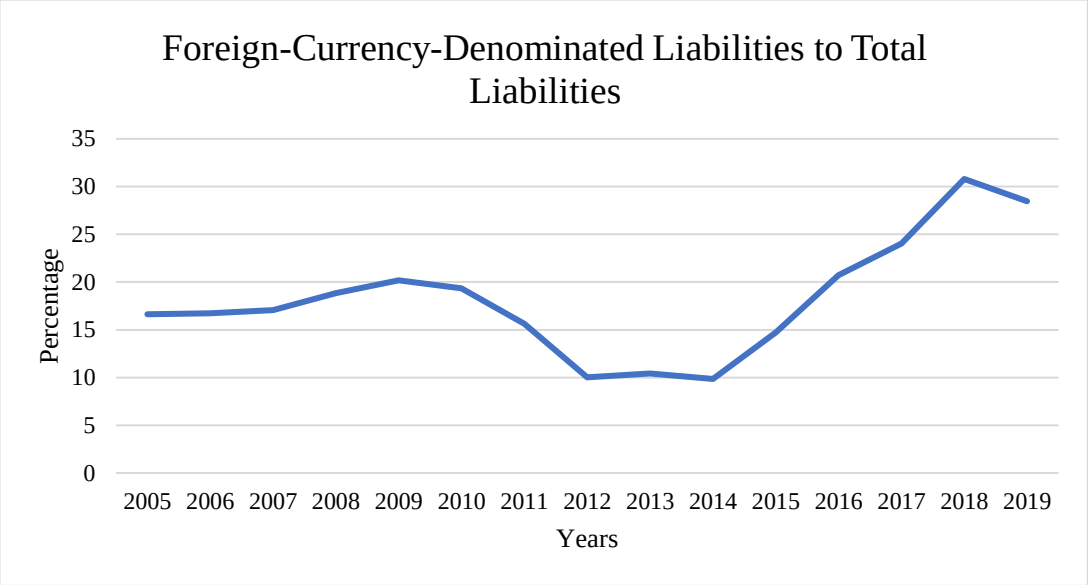
Figure 20: Credit Dollarization between 2005 and 2019 in Argentina



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

Credit dollarization was in the 10-15% band between 2005 and 2011 in Argentina, and it started to decline since then. Credit dollarization, which decreased to 4.47% in 2015, started to increase and exceeded 25% in 2018. In 2019, it fell below 25% again (Figure 20).

Figure 21: Liability Dollarization between 2005 and 2019 in Argentina



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indıcators, 2020)

Liability dollarization, which was in the 15-20% band between 2005 and 2008, has started to decrease in 2009 and equalled 10% in 2012. However, it increased again in 2014 and exceeded 30% in 2018, as seen in Figure 21.

4.3 Mexican Economy: A Historical Perspective

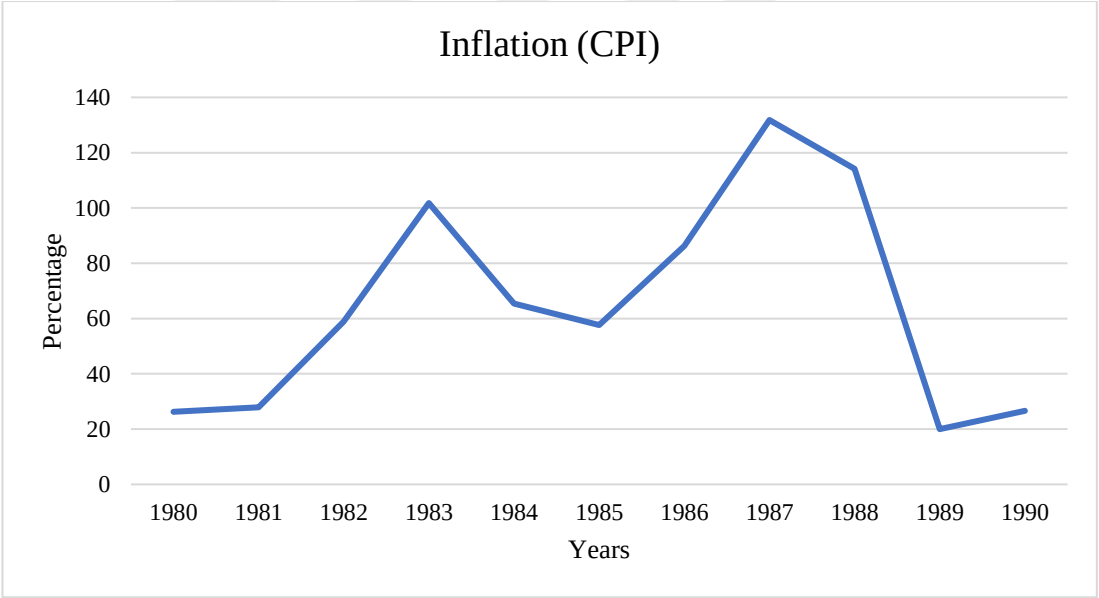
Mexico is the fifteenth largest economy in the world and the second largest economy in Latin America. Like every developing country, Mexico has survived many crises in the past and struggled with dollarization. After 1980, the Mexican economy experienced two major economic crises in 1982, and 1994.

From the mid-1950s to the 1970s, the Mexican economy was an exemplary country in terms of financial stability and growth (Hacıhasanoğlu, 2005). In the 1970s, significant oil reserves were found in Mexico, and confidence in the economy increased.

Mexico aimed to liberalize its foreign trade with NAFTA membership in the mid-1980s. However, the debt crisis of 1982 deeply affected Mexico, like the other Latin American countries. Foreign capital flowing to Latin American countries came to a standstill (Güloğlu and Altunoğlu, 2002). With the crisis's effect, the state brought strict controls on foreign exchange, and the banking sector was nationalized. Inflation

rose rapidly in 1982 and 1983 due to external financing shortages and public deficits (Figure 11). As a result, Mexica signed a stand-by agreement with the IMF in 1983 and launched a new economic program. The program, which had positive effects on the economy in the first years, was interrupted by the 1985 earthquake and plummeted oil prices (Hacıhasanoğlu, 2005). In 1987, with the devaluation made to close the foreign trade deficit, inflation increased above 130%. The Mexican government adopted a new reform package called 'Pacto' (Pact for Economic Solidarity) in 1987 to bring inflation down. With this economic package, the country switched to a fixed exchange rate system, and privatization and liberalization were brought to the fore (Bahçeci, 1997). Inflation fell soon, with tighter fiscal policy, higher tax revenues, and curtailment of public spending (Merrill and Miro, 1997). As Figure 22 shows, inflation started to fall in 1988 due to Pacto, and in 1989 it decreased down to 20%.

Figure 22: Inflation Rate Between 1980-1990 in Mexico



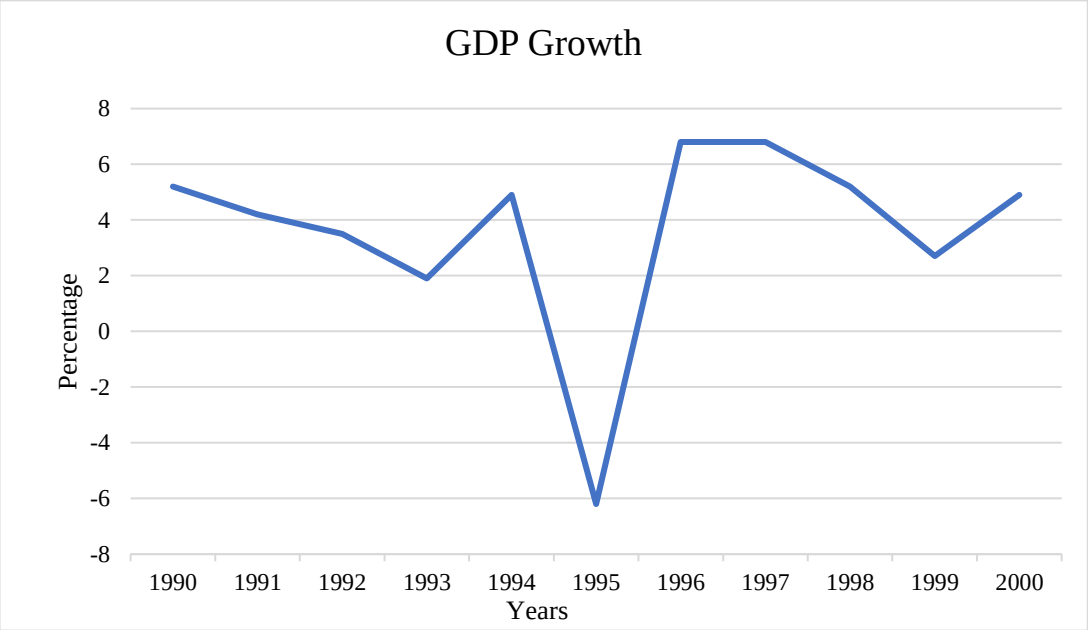
Resource: Authors own calculations used (Data from: World Bank, 2020)

In 1989, the fixed exchange rate system was abandoned, and the crawling peg exchange rate regime was adopted. The program was successful in lowering inflation. Inflation fell to 20% in 1989. However, as a result of the program, domestic real interest rates remained high, and reserves started to decline. Therefore, the need for external financing increased. Thus, the program's second leg, "The Pact for Stability and Growth," started to be implemented. This new program aimed to sustain falling

inflation and to ensure growth (Bahçeci, 1997). With the program, interest rates were released in the 1990s, and eighteen banks were privatized. Besides, credit restrictions were lifted, and the obligation to keep liquidity in bank vaults was abolished. A recovery in the economy was achieved with these policies (Güloğlu and Altunoğlu, 2002).

In 1994, a significant economic crisis known as the "Tequila Crisis" occurred in Latin America. Financial shocks occurred in the exchange rate market due to adverse political events, the overvalued exchange rate, wrong fiscal policies, and the economic crisis. The peso was devalued, and the exchange rate band was raised to 15% (Meredith et al., 2004). Although the exchange rate band was expanded by 15% on December 20, the peso lost more value than expected. With the rapid melting of foreign exchange reserves, the crawling peg regime was abandoned on December 22, 1994 (Güloğlu and Altunoğlu, 2002). This situation caused the interest rates to increase excessively and foreign investors to withdraw their funds from the country (Engin, 2007). The government had to adopt tight fiscal and monetary policies to ensure macroeconomic stability. Increases in government controlled prices and higher value-added tax (VAT) rates were applied. Inflation decreased, and public finances improved with the effect of these tight fiscal and monetary policies (Meredith et al., 2004). The crisis affected all of Latin America with its "tequila effect." According to Kesbiç and Çevik (2007), one of the lessons that can be learned from the Mexican example is that when fighting inflation, fixed exchange rate and low rate devaluations can be successful. However, after inflation is reduced, the fixed exchange rate regime can lead to greater negative consequences than inflation, such as the balance of payments crisis, as in the Tequila Crisis.

Figure 23: GDP Growth Rate between 1990 and 2000 in Mexico



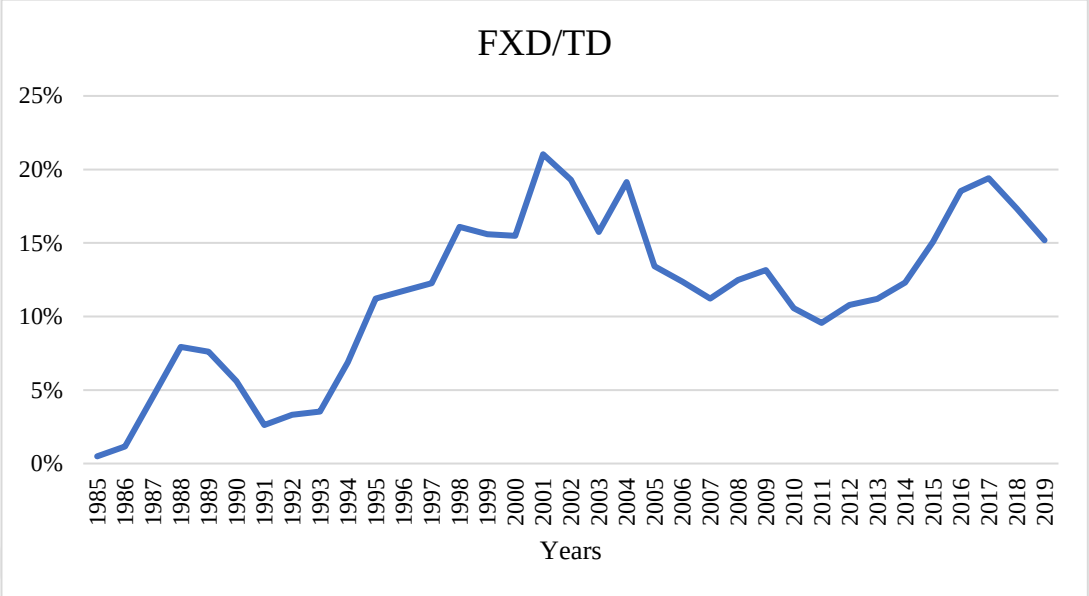
Resource: Authors own calculations used (Data from: World Bank, 2020)

Mexico had a positive growth before the crisis, but the GDP growth rate decreased to -6% in 1994 (Figure 23). In January 1995, the IMF prepared a $50 billion rescue package for Mexico. With the adoption of the floating exchange rate regime, inflation rose to 36% in 1995, and the economy contracted by 6.3%.

Mexico was one of the countries least affected by the 1997 Asian crisis. The biggest reason for this is that the country's economy has become more resistant due to the debt crisis in the 1980s (Çil, 2009). The Mexican economy grew 6.8% in 1997 and 5.1% in 1998.

In the following years, the Mexican economy was hit by the 1999 Brazil and 2001 Argentina crises and was also affected by the 2008 Global Economic crisis. It intervened in the foreign exchange market in 2008 to protect the peso's value, but in 2009 it shrank by 5.2%.

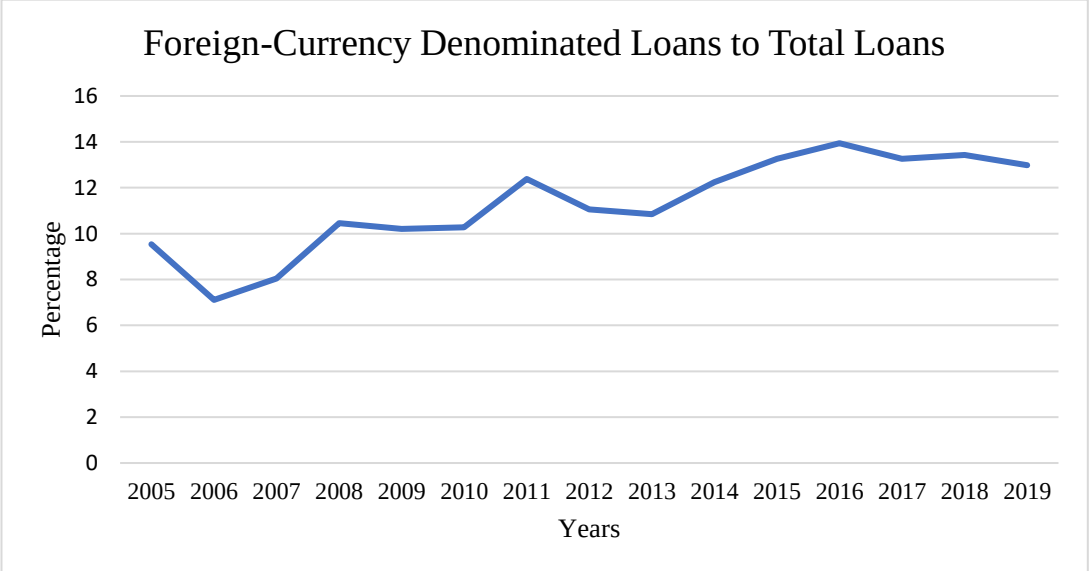
Figure 24: Asset Dollarization Between 1985 and 2019 in Mexico



Resource: Authors own calculations used (Data from: Banxico, 2020)

Mexico has a relatively lower level of asset dollarization than other Latin American countries. Between 1985 and 2019, it experienced the highest rate of dollarization in 2001. Today, Mexico has reduced this rate to 15% - 20% band (Figure 24).

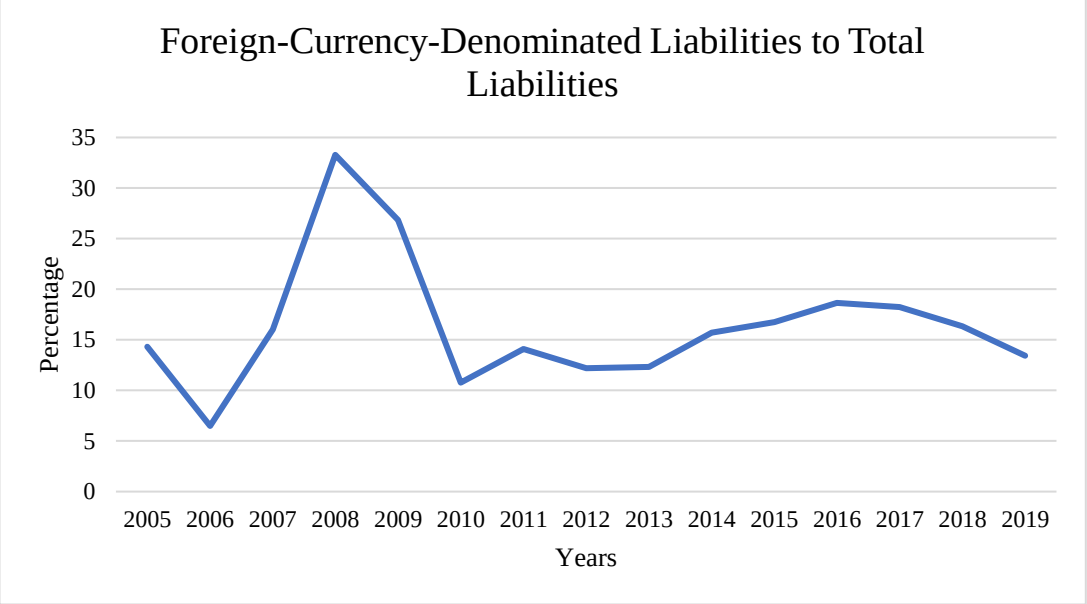
Figure 25: Credit Dollarization between 2005 and 2019 in Mexico



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

Credit dollarization in Mexico reached its lowest level in 2006 with 7%. The highest level was seen in 2016, where the credit dollarization ratio surged to 14% (Figure 25).

Figure 26: Liability Dollarization between 2005 and 2019 in Mexico



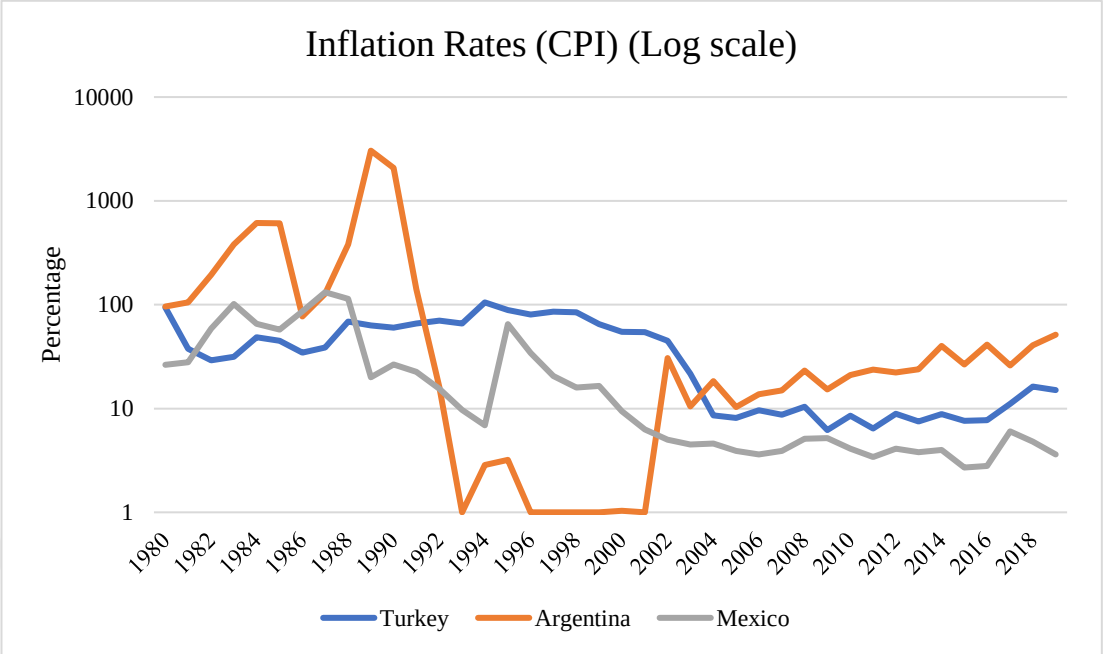
Resource: Authors own calculations used (Data from: IMF Soundness Indicators, 2020)

Liability dollarization in Mexico reached 33% due to the global financial crisis, but declined after this date. Liability dollarization, which was between 10-20% between 2010 and 2019, was measured as 13% in 2019 (Figure 26).

4.4 Turkey, Argentina, and Mexico: A Comparison

Turkey, Argentina, and Mexico are three developing countries that have weathered many crises in the past. Moreover, these three countries applied to the IMF to resolve their crises but could not quickly overcome their detrimental effects. Many monetary and fiscal policies were implemented in all three countries to ensure macroeconomic stability. Especially the fight against inflation has been the common point of these countries. In this context, in Mexico and Turkey, inflation targeting were determined as monetary policy framework in 2001 and 2006 respectively. On the other hand, Argentina has adopted the monetary aggregate target in 2018.

Figure 27: Inflation Rates Between 1980 and 2019 in Argentina, Mexico, and Turkey[8]

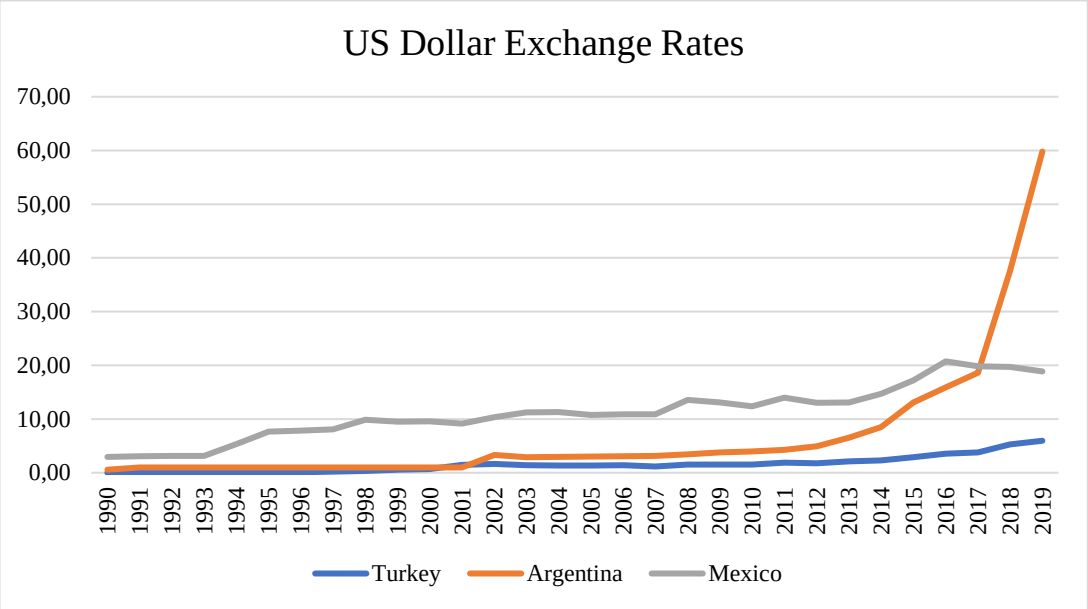


Resource: Authors own calculations used (Data from: World Bank, 2020)

According to Figure 27, Argentina is the country where inflation fluctuates the most. Argentina, experiencing both negative inflation and hyperinflation, has still not reduced inflation to single digits today. Mexico has been able to stabilize the inflation rate since the mid-1990s. Mexico adopted inflation targeting in 2001 and Banxico's primary goal is low and stable inflation. For this reason, the economic policies they implement are aimed at keeping inflation low. In Turkey, because of inflation targeting implemented after the 2001 crisis, inflation did not exceed the 20% band since 2004. However, inflation has increased in recent years compared to the previous years. Both Turkey and Mexico, have adopted inflation targeting. However, Mexico has been more successful in lowering inflation.

[8] GDP deflator data was used in the Argentina chart, and the inflation in Argentina during the years of deflation was stated as 1.

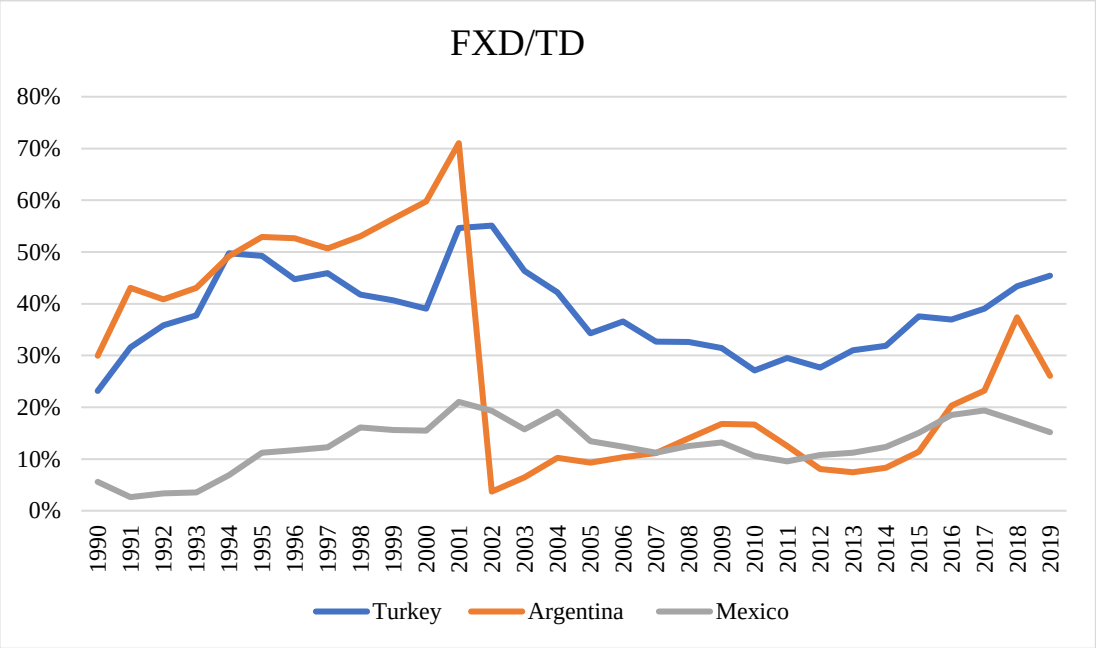
Figure 28: Exchange Rates Between 1990 and 2019 in Argentina, Mexico, and Turkey



Resource: Authors own calculations used (Data from: IFS, 2020)

As shown in Figure 28, Argentina's US dollar exchange rate is the highest among these three countries. After the 2001 crisis, a floating exchange rate regime was implemented in Argentina. Until 2012, the exchange rate ($/peso) did not exceed 10, but the Argentine peso has rapidly lost value in recent years. In Mexico, stability in the inflation rate could not be achieved in the exchange rate. Even if the exchange rate fluctuates, it has shown a continuous upward trend but has fallen below 20% in recent years. In Turkey, the exchange rate is relatively low compared with the other two countries. The exchange rate, which has increased since 2012, attained its highest rate in 2019 and reached the 6% limit.

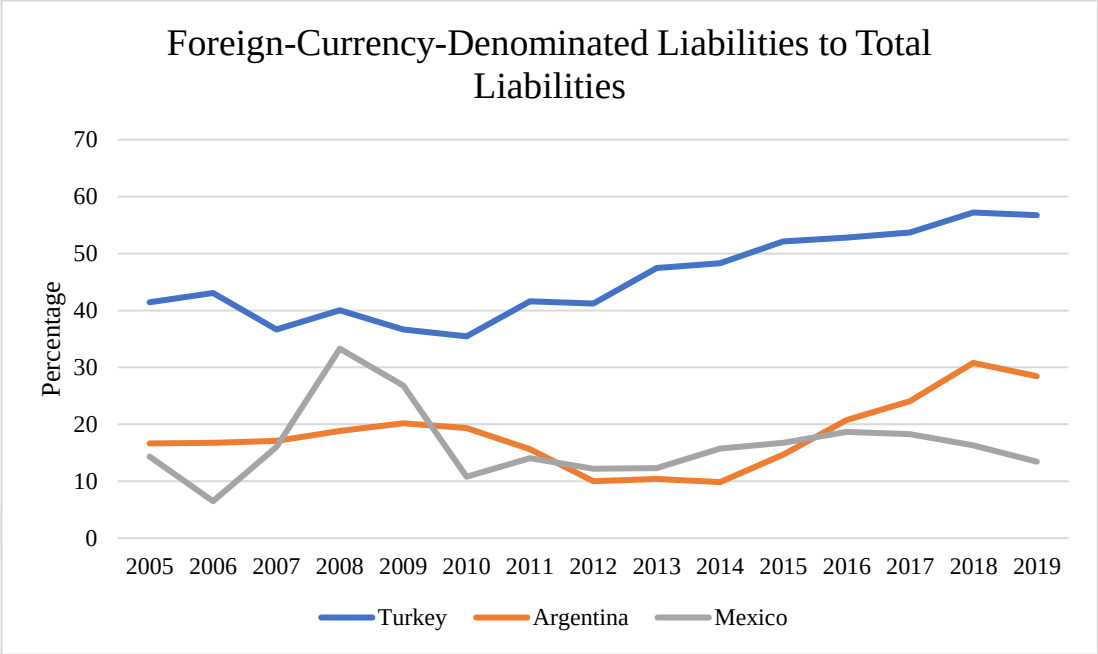
Figure 29: Asset Dollarization between 1990 and 2019 in Argentina, Mexico, and Turkey



Resource: Authors own calculations used (Data from: CBRT, Banxico and BCRA, 2020)

Argentina reached its highest asset dollarization level during the 2001 crisis but then reduced this rate in the following years. However, asset dollarization started to increase again in 2012. In recent years, it has fluctuated between 20% and 40%. On the other hand, Mexico is the country with the lowest asset dollarization rate. It reached 20% in 2001 when the dollarization was the highest, but then it fell to 15% in recent years. Among these three countries, the country with the highest asset dollarization rate is Turkey. Asset dollarization has increased continuously since 2012 in Turkey, reaching 45% in 2019 (Figure 29).

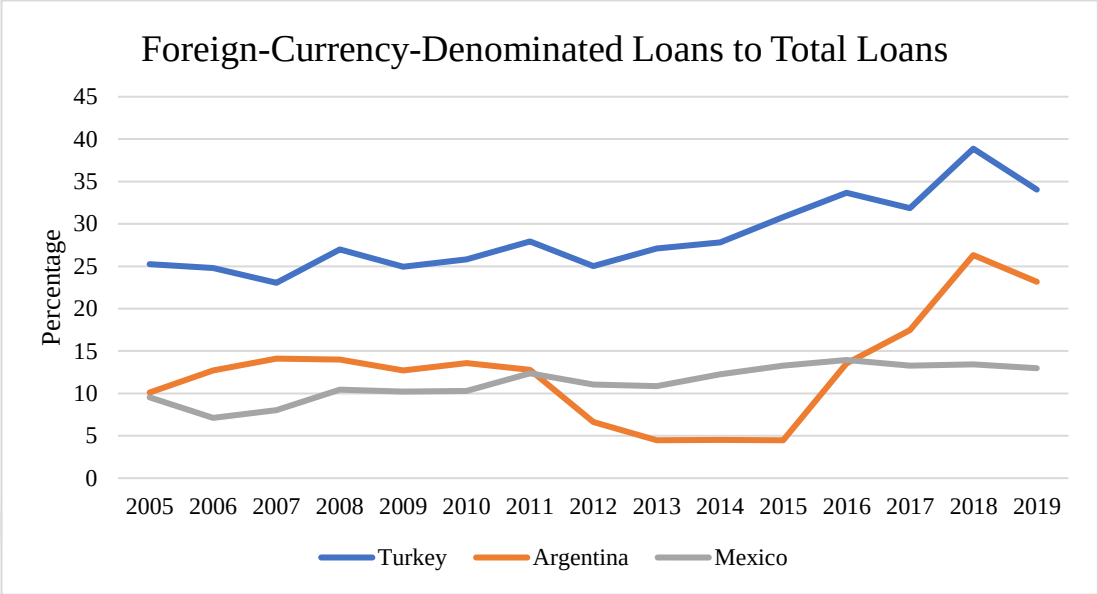
Figure 30: Liability Dollarization between 2005 and 2019 in Argentina, Mexico, and Turkey



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

Liability dollarization is also highest in Turkey, compared to Argentina and Mexico. In recent years, Turkey has a liability dollarization rate above 50%. This is a hazardous situation for those who are in debt because of currency risk. The depreciation of the exchange rate will increase the liability of borrowers. Liability dollarization is not low in Argentina and hovers around 30%. For Mexico, the liability dollarization rate has a decreasing trend especially in the recent years (Figure 30).

Figure 31: Credit Dollarization between 2005 and 2019 in Argentina, Mexico and Turkey



Resource: Authors own calculations used (Data from: IMF Financial Soundness Indicators, 2020)

Credit dollarization in Mexico is not too volatile. It has been fluctuating around 10 to 15% in the recent years. Among the three countries, credit dollarization has been highest in Turkey for all the years considered. However, this ratio has tended to fall since 2017. In Argentina, loan dollarization has increased since 2015 but has declined in the recent years (Figure 31).

Exchange rate regimes are examined in two ways, de facto and de jure. The reason for this is the differences between the exchange rate regime that countries notified to the IMF and the exchange rate regime they apply. The exchange rate regimes that the countries have notified to the IMF and have to officially apply are called de jure exchange rate regimes, and the exchange rate regimes they actually implement are called de facto exchange rate regimes. According to Calvo and Reinhart (2002), the idea of "fear of floating" lies in the emergence of this distinction. Countries restrict the volatility of exchange rates while applying a floating exchange rate regimes.

Turkey, Argentina, and Mexico have experimented a lot with their exchange rate regimes.

Table 10: De Facto Exchange Rate Regimes in Turkey, Argentina and Mexico

	Years	De Facto Exchange Rate Regime	Monetary Policy Framework
Turkey	1981-1983	Managed Floating	
	1984-1997	Freely Falling	
	1998-2000	De Facto Crawling Band	
	2001-2002	Freely Falling	Implicit Inflation Targeting (Between 2001-2006)
	2003-2009	Freely Floating	*Inflation Targeting (since January 2006)*
	2010-2016	De Facto Moving Band	
Argentina	1987-1990	Freely Falling	
	1991-2001	Currency Board	
	2002	Freely Falling	
	2003-2015	De Facto Crawling Band	
	2016	Freely Falling	*Monetary Aggregate Framework (since 2018)*
Mexico	1982-1988	Freely Falling	
	1989-1991	Pre-Announced Crawling Peg	
	1992-1993	De Facto Peg	
	1994	Pre-Announced Crawling Band	
	1995	Freely Falling	
	1996-2016	De Facto Moving Band	*Inflation Targeting (since December 2001)*

Resource: Ilzetzki et al. (2019)

After the crisis in 2001, the floating exchange rate regime was adopted in Turkey. According to the IMF, it is a country that implements a floating exchange rate regime and inflation targeting monetary framework since 2019 (Table 10).

Argentina has applied a currency board within the scope of the Convertibility Plan in the past, and fixed the peso to US dollars. However, as a result of the 2001 economic crisis, they left the exchange rate fluctuating. Argentina started to implement a floating exchange rate regime in 2019 and has adopted the monetary aggregate target since 2018 as seen in Table 10.

Mexico adopted a floating exchange rate regime after the 1994 Tequila Crisis. Mexico has adopted inflation targeting since 2001 and has been relatively successful.

The striking point here is that all three countries have adopted floating exchange rates after the economic crises.

CHAPTER 5

CONCLUSION

Dollarization is sometimes seen as a problem for many emerging economies and sometimes preferred as a solution. The countries that prefer it as a solution give up their local currency and turn a stronger foreign currency into a legal tender. This is called full dollarization. In countries that interpret dollarization as a problem, partial dollarization is seen as the transfer of one or more functions of the domestic currency to a stronger foreign currency.

There are many factors that affect dollarization, but in general, the reason for dollarization is the failure to achieve macroeconomic stability. In the literature, inflation is defined as the most important factor that triggers dollarization. Dollarization, which has many reasons, can impose heavy costs on countries. One of the heaviest costs of dollarization is the loss of monetary policy effectiveness in heavily dollarized countries. This situation deeply affects the economies of the country.

Dollarization has become a concept synonymous with the Latin American countries due to economic problems that started in the 1980s and increased in the 1990s. The region's proximity and trade with the US has also affected the dollarization rates. Also, dollarization in Turkey has become a topic much discussed after financial liberalization in 1980s.

In this study, Turkey and two Latin American countries, Argentina and Mexico's dollarization processes were examined. Inflation rates, exchange rate rates, exchange rate policies, and financial dollarization rates of these three countries were compared.

It is no coincidence that Mexico and Argentina were chosen among the Latin American countries as case studies. Argentina was many times named together with full dollarization due to the currency board system implementation in the past. However, due to the loyalty to the peso in the country, full dollarization has not occurred. Mexico, on the other hand, is a country that has managed to de-dollarization despite having struggled with many economic crises in its past.

As a result of the comparison, it is seen that the de-dollarization process that took place in the past is still ongoing in Mexico. Also, the inflation targeting policy applied in Mexico has yielded positive results, and high inflation is taken under control. In Argentina, due to the currency board system adopted, the dollarization rate is low despite the full dollarization discussions that have come up many times. Surprisingly, although exchange rate and inflation rates are still very high in Argentina, dollarization rates have decreased in recent years. In this case, the question that should be answered is whether inflation, which is shown to be the leading determinant of dollarization, is really the main reason for dollarization in Turkey. In Turkey, inflation rate and exchange rates have increased in the recent years. In 2019, Turkey's asset dollarization ratio increased to 45%. However, what is more scary is that that the liability dollarization ratio has surged to 58%. Considering the sharp depreciation of the TL in recent years, it is obvious how heavy the economic burden of these liabilities will be.

Although inflation targeting is implemented in Turkey, financial dollarization still continues to increase. In this case, it can be concluded that monetary policy is not implemented efficiently. If the Turkish central bank could implement more independent monetary policy strategies, it is clear that dollarization can be reduced further in Turkey. Also, if a true *de facto* floating exchange rate system could be applied, the dedollarization process might speed up in the country.

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