IN DOLLAR WE TRUST: WHAT DRIVES

FINANCIAL DOLLARIZATION IN GEORGIA?

By

Tamar Siradze

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Supervisor: Professor Julius Horváth

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Abstract

This thesis examines the main determinants of financial dollarization in Georgia from 1996 to 2018 and studies why the idea "in dollar we trust" is very strong in the Georgian population. I use the methodology proposed by Levy Yeyati (2005), where I analyze the key drivers of financial dollarization in the portfolio, market failure, and substitution views framework. Using Ordinary Least Squares regression model, I regress the deposit dollarization ratio on a set of explanatory variables to capture the main determinants. The empirical results support the portfolio view and reveal that high financial dollarization is driven by demand-side factors. In particular, the data indicates that the influence of average past inflation increases people's doubts towards the Georgian Lari and its economy. Thus, the stability of macroeconomic institutions is a crucial point for further economic development, which will increase the trust in the Georgian economy. The thesis further suggests the relevant policy recommendations addressing the high financial dollarization in Georgia.

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1 Introduction

Georgia is a small country with about 4 million people living on 69,700 square kilometers of land. After the Soviet Union collapse in 1991, the country recovered in the mid 2000s and took a fast pace towards economic development.¹ Being an independent country, Georgia strives to promote its ancient identity and history. After being a part of the Russian empire for a long time, the National Bank of Georgia introduced its own currency – the Georgian Lari (an old Georgian word meaning property, treasure), which has been actively used since 1995. The state actively encourages the Lari to be a symbol of independence and unique national culture. Furthermore, the country adopted the Lari's subunit Tetri, which has been used since 600 BC in ancient Colchis², to highlight Georgia's links to ancient history. Although the Lari gave Georgia monetary autonomy, the national pride is not enough for people to trust their own currency and economy.

"In dollar, we trust!". This is the motto of the high financial dollarization (the ratio of foreign exchange deposits and loans to total deposits and loans) in Georgian economy. Although Georgia has seen significant economic growth, as an emerging economy it is characterized by a high level of financial dollarization, which negatively effects the country's further financial development and macroeconomic stability. Financial dollarization is a persistent phenomenon, when economic agents of one country rely more on a foreign currency and, thus, reduce the power of the local currency. It is an expected choice of people trusting

¹ All the noted information comes from the National Statistics Office of Georgia (geostat.ge/en), the National Bank of Georgia (nbg.gov.ge) and the BBC monitoring webpage (monitoring.bbc.co.uk)

² Colchis was an ancient Georgian polity of Egrisi.

the dollars more than the Georgian currency, because of the macroeconomic instability, inflation volatility, past and current political uncertainty. According to Bennett, Borensztein, and Baliño (1999) in some cases dollarization might be a natural result of liberalizing financial markets and an open economy as an asset substitution gives an opportunity of diversification, which is an important instrument for hedging the external risk. However, everything needs a balance and nothing exaggerated is useful for a healthy economy. Thus, countries try to find an optimal level of dollarization, which is not very easy to reach.

In order to prevent any disease in medicine, firstly, you should know the main drivers of it, why and how it can be caused. After you know the etiologies of the problem then you can act properly and try to avoid it. Similarly, in order to reduce the level of dollarization and reduce the share of foreign currency denominated assets, policy makers and macroeconomic institutions have to have a clear picture of the key determinants of financial dollarization in a specific local market. In such a way, they can better understand which demand or supply side factors impact the level of dollarization.

According to the literature on dollarization, there are major drivers of deposit dollarization, which reflect demand and supply side factors such as inflation rate, interest rate, the minimum variance portfolio ratio and changes in exchange rate. Levy Yeyati (2005) provides three types of views – portfolio, market failure and currency substitution view - explaining the determinants of financial dollarization, where the demand and supply factors are analyzed to check which view is supported by the specific analyzed country's data. While there have been studies of financial dollarization determinants on a particular group of countries where Georgia is also included, only limited research has been done on the case of Georgia itself. Consequently, this motivated me to find out why people in Georgia trust dollar more and drive the level of dollarization up in the economy.

The purpose of this thesis is to revisit the evidence on the determinants of financial dollarization by using a new updated database and see the key determinants of financial dollarization specifically in Georgia, where high dollarization started with deposits and later, due to policy restrictions, moved to the loans side of the banking balance. Nevertheless, currently deposit dollarization still remains higher than the credit dollarization level. I use the modelling approach of Levy Yeyati (2005) paper to analyze the deposit dollarization drivers by OLS method regressing the deposit dollarization ratio on a set of basic variables to capture the main drivers. In particular, to check the portfolio view I use the average past inflation and see the currency substitution level. Broda and Yeyati (2003) highlight that a positive correlation between a real exchange rate and a probability of default increases the level of dollarization. Thus, for testing the market failure view regression includes real GDP growth and real exchange rate changes, where the relationship between those variables tests the hypothesis that the more procyclical is the real exchange rate the stronger is dollarization bias. I use the Country Policy and Institutional Assessment (CPIA) index calculated by World Bank to test an institutional view. In addition, to uncover institutional factors I include the variable of GDP per capita.

The results in the case of Georgia are slightly different from the CESEE countries, because of the used data, the time period and the specifications of the country. Using a dataset coming from IMF, National Bank of Georgia and World Bank Data, I show that the high level of currency substitution is mainly influenced by Georgia's long economic history of high inflation, political and economic volatility that led people to go for dollars to protect their incomes and assets from the hit of inflation. This should be addressed by promoting the trust in Georgian currency.

The thesis is structured as follows. The next chapter presents the literature and theoretical framework of the determinants and consequences of the financial dollarization.

Chapter 3 discusses the main issues raised by high level of financial dollarization in case of Georgia and the current state of its economy, while chapter 4 analyzes three main views explaining financial dollarization, describes the dataset, presents regression analysis and reveals its results. Finally, Chapter 5 summarizes the main findings and suggests relevant policy recommendations.

2 Theoretical Framework

2.1 Determinants of Dollarization

According to Alvarez-Plata and García-Herrero (2008) dollarization refers to the holdings by residents which are denominated in foreign currency. There are two types of dollarization: official and unofficial. The economy faces official dollarization when foreign currency is used as a unit of account for public contracts, thus, has a legal tender status and is exclusive. While in case of unofficial dollarization, the foreign currency is used alongside the domestic one for savings and exchange purposes (Alvarez-Plata and García-Herrero 2008, p.3). In this respect, this thesis will focus on the unofficial financial dollarization.

Most of the research papers on financial dollarization conclude that there are subjective and objective reasons of highly dollarized economy, such as a high level of inflation, economic and political instability, exchange rate severe volatility and lack of national money supply. For instance, Kokenyne et al. (2010) state that the politics has a huge influence on the level of dollarization. The weakness of monetary policy and low power of monetary authorities create a good ground for high inflation, lack of trust and low real interest to save in national currency. As people try to eliminate the risks by portfolio diversification they invest and save more in dollars than in local currency (Ize and Yeyati 2005).

Bannister at el. (2018) analyze the determinants of de-dollarization and identify three key pillars: the proper exchange rate regime, relevant macroeconomic policy and developed local currency capital markets. Firstly, Ize and Yeyati (2005) state that the economic institutions should set the proper exchange rate regime, which plays an important role in terms of de-dollarization. Besides they refer to dollarization as a reaction to macroeconomic instability, caused by high exchange volatility and high inflation. In the economy where

consistent exchange rate depreciations increase macroeconomic uncertainty, economic players prefer foreign currency over their national currency in order to insure the real value of their consumption. Moreover, Bannister et al. (2018) also argues that for minimizing risks domestic investors diversify the investment portfolio through the focus on variance of expected returns, which are sensitive to the inflation and real exchange rate. Therefore, highly dollarized countries have balance sheet mismatches which again negatively affect the exchange rate and depreciate it. Thus, this process continues over and over, having a "spiral effect", keeping the level of dollarization persistently high (Ize and Yeyati 2005, Chamon and Hausmann 2005).

Secondly, according to Kokenyne et al. (2010) a strong weapon against financial dollarization is a macroeconomic stabilization, which requires the relevant macroeconomic policies lowering inflation and stabilizing exchange rate. Catão and Terrones (2016) also state that prudential regulations should be differentiated so as to reduce bank's incentives to transact in foreign currencies, which will drive economic agents to minimize the external risks of foreign currency loans and deposits.

Beside credible monetary policy and proper exchange rate regime, financial market development is an important determinant for successful de-dollarization (Kokenyne et al. 2010, 11–12). Generally, while making decisions, people have a free will and choice. Thus, local capital market should trade different types of financial securities to give its customers' ability to choose. Therefore, frequently used dollar denominated assets should have some alternatives, which will increase the investments in local currency denominated securities. Consequently, Laeven (2014) state that developing local capital and financial markets will increase attractiveness of local currency.

Burnside et al. (2001) highlight another problem – a moral hazard. Under asymmetric payoffs, government regulations artificially insure dollar borrowers and creditors from large losses, which might lead to dollarization. However, one of the important determinants

impacting the dollarization level is the existence of market frictions or failures in credit markets. The national currency's devaluation expectations might increase the premium of local currency and the cost of liquidations, which again impacts the level of dollarization (Bannister et al. 2018, 9–10). Particularly, high credit risks on local currency loans drive creditors to lend in dollars, which limits the effects of currency risk on creditors' portfolios. Luca and Petrova (2008) also state that there is a strong bound between financial dollarization and banking activities. Therefore, the role of incomplete credit markets highlights the problem of dollarization.

2.2 The consequences of Dollarization

Is dollarization a type of catastrophe and is it such a bad phenomenon? Does it have only negative effects on the economy? Although the answers to these two questions are not thoroughly investigated, there are some researchers who tried to empirically examine the issue. Eichengreen and Hausmann (1999, pp.32-35) highlight that the dollarization can act as a scaffolding and may expand the menu of financial options to economic agents and investors, which might develop market and improve financial stability. According to Reinhart, Rogoff, and Savastano (2003) having both domestic dollarization and an external liability dollarization might have a positive effect on financial deepening. On the other hand, Burnside et al. (2001) regressed on a number of instruments including the main components of regulations for dollarization and found that for most of the countries considered in the sample there is an insignificant correlation between dollarization and deeper financial markets, while results are different in high inflation economies. However, regressing financial depth (calculated as a division of M2 over GDP) on a dollarization legal restriction index, outcome with a five percent significant level showed a positive correlation. Thus, results indicate that higher level of dollarization is associated with shallower financial markets (Nicoló, Honohan, and Ize 2005). Finally, according to Bennett et al. (1999) dollarization itself is not a catastrophe as all open economy countries are characterized with some level of financial dollarization, but nothing exaggerated is effective and optimal. Therefore, the main target of highly dollarized countries is not to diminish the level of dollarization at all in the economy, but to reduce its level and put a strong leash on it for further control. Levine (2004) highlight that countries which managed to improve their banking sectors' efficiency and financial inclusion, reached high economic growth rate and significant financial development. However, financial dollarization remains a persistent phenomenon. There is no doubt that compared to the full dollarization partial dollarization includes much more risks related to balance sheets, currency mismatches, weaker monetary policy transmission and weak financial stability.

3 Financial De-dollarization: The Case of Georgia

In the 1990s all post-Soviet Union countries became a subject of a dollarization. Georgia is one of these economies too, in which moderate inflation and stability of the exchange rate do not provide enough incentives for people to switch to the domestic currency, the Lari. According to the National Bank of Georgia, the US dollar has the 65-70% share in total foreign currency holdings in Georgia. Thus, since 2010 there are debates related to this issue, which mainly refer to how desirable is to reduce financial dollarization in the country and, if it desired, what should be done to reduce it.

3.1 The issues of the financial dollarization

As it is mentioned in Chapter 2 of the thesis, the high level of financial dollarization does not automatically mean that it is not optimal or is the case of urgency. Based on Ize and Yeyati (2005) denominating some parts of assets and liabilities in foreign currency is a tool to hedge the exchange rate risk. Especially it becomes more important in the open economy. For instance, exporters have their revenues in foreign currency and they prefer having obligations in the same currency, which naturally eliminates the exchange rate risk (Serra and Stiglitz 2008). However, it is noteworthy that such hedging of the risk cannot happen if the exporter has income in euros or in Turkish Liras, while liabilities are in US dollars. But according to the National Bank of Georgia, as the non-trading sector has a large share in the economy and Georgia trades more with Eurozone and Turkey rather than with the United States, it is less likely that dollarization eliminates this type of exchange rate risks.

Secondly, according to Eichengreen and Hausmann (1999, pp.25-26) denominating some shares of assets and liabilities in foreign currency helps to hedge the risk of income fluctuation. In case of recessions the reliable foreign currencies are stable, but in case of economic stability they are "weak". While deposits denominated in US dollars are not influenced by negative fluctuations in the Georgian economy, citizens have preferred deposits in US dollars as a kind of insurance. However, the opposite occurs when there is a strong economic growth and value of deposits denominated in US dollar decreases compared to local currency. In other words, in Georgia dollarization is a kind of income volatility insurance.

Despite the fact that dollarization can eliminate exchange rate risks and income fluctuation risks, the level of dollarization is very high in Georgia. Although since 2004 Georgia's macroeconomic stability has a positive trend and is higher than in other developing countries, according to National Bank of Georgia the level of financial dollarization in Georgia is 63%, while in developing countries on average it is 17%.

Therefore, there are several reasons for running de-dollarization policy in Georgia. Particularly, high level of dollarization:

1. Reduces the flexibility of the open economy and increases the real economy's fluctuations (Palley 2003);

2. Increases the risk of financial instability (Nicoló, Honohan, and Ize 2003);

3. Reduces efficiency of monetary policy (Reinhart, Rogoff, and Savastano 2003);

4. Reduces the efficiency of the economy by negative externalities and moral hazard (Broda and Yeyati 2003).

5. Prevents international ratings to improve (Kokenyne et al. 2010).

Obviously, these problems are linked to each other, because each one whether separately or together eventually decreases country's economic growth. Since each of these problems hinders economic development, it is essential to review them separately and see empirical evidence of them.

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Problem 1: ...Reduces the flexibility of the open economy and increases the real economy's fluctuations

According to Leigh et al. (2016) the main advantage of a flexible exchange rate is that it dampens the effects of foreign shocks and, therefore, can lessen negative influence on the open economy. In an ideal situation, the open economy can avoid and completely neutralize foreign shocks through a floating exchange rate. The absorption of foreign shocks with a nominal exchange rate is attractive, because the exchange rate can be quickly adjusted with the new changes and reality, whilst absorption of foreign shocks with adjusted prices and salaries is more complicated (Frieden 2014, 22).

Friedman (1953) argues that the flexibility of the exchange rate increases the flexibility of the open economy. However, in case of high dollarization the flexible exchange rate and its adjustment (which can be appreciation and depreciation) not only softens foreign shocks but, on the contrary, also increases fluctuations in foreign currency loans, known as a balance sheet effect. This process does not hinder the foreign shocks and reduces the advantage of a flexible exchange rate (increasing the flexibility of the economy) (Céspedes, Chang, and Velasco 2004). For example, when there is a negative external shock, less dollarized country's currency devaluation will reduce the risks of net exports deterioration (initial shock neutralization). While a high dollarized country's currency devaluation has a higher risk of losses, as it cannot avoid net exports deterioration and, thus, reduces a demand on foreign currency debts, which restricts economic activity. In other words, the flexible exchange rate is more efficient in case of less dollarized countries, rather than countries which have a high level of dollarization.

However, according to Gertler et al. (2003) a flexible exchange rate reduces external shocks and maintains the low level of dollarization that helps the economy to efficiently control and avoid the external risks. In case of external shocks high financial dollarization leads the country to adjust interest rates more aggressively and frequently. This prevents the use of

flexible exchange rate to eliminate those shocks, which limits economy's flexibility and increases its volatility.

According to Levy-Yeyati and Sturzenegger (2003) the best combination for an open economy's flexibility is low dollarization level and a floating exchange rate. They add that the latter is associated with higher economic growth and lower volatility of the economy. Moreover, Carranza et al. (2011) conclude that high financial dollarization leads to a highly volatile economy. Thus, in case of high dollarization the floating exchange rate is a better instrument than the fixed one. Overall, one can tentatively conclude that having the floating exchange rate, and reducing the level of dollarization, Georgia will reduce the volatility of country's economy which prevents its economic growth.

Problem 2: ... Increases the risk of financial instability

According to Nicoló, Honohan, and Ize (2003) despite the fact that in a high inflation environment dollarization positively effects the financial sector's development, it is better to reduce the level of inflation rather than increase financial dollarization causing financial instability. The high rate of dollarization increases the financial instability risks as borrowers' experience currency discrepancy. In other words, the borrower's larger share of assets is denominated in local currency, while liabilities are in foreign currency. Reinhart, Rogoff, and Savastano (2003) also highlight that the increase of debt burden caused by exchange rate depreciation can result the mass defaults and, in extreme cases, a bank run. Consequently, to avoid the mass defaults, banking sector restricts its limits to lending, which significantly reduces assets' prices and economic growth. As a result financial instability has a negative effect on every sector of the economy (Reinhart, Rogoff, and Savastano 2003, pp.11-13).

Another negative effect of high financial dollarization is that it causes frequent fluctuations in the exchange rate. Aghion, Bacchetta, and Banerjee (2001) state that if market

participants think that the exchange rate changes significantly then those expectations can frequently move the exchange rate to its new equilibrium. In other words, if the financial sector is highly dollarized then depreciation of exchange rate weakens economic activity, which depreciates exchange rate more and more experiencing the spiral effect. Moreover, according to Garcia Pascual et al. (2006, pp.22-23), in some cases, the high financial dollarization causes speculative attacks causing the excessive fluctuations of the exchange rate. While policymakers aim to soften and decrease the frequent fluctuations of the exchange rate, the risk of speculation increases as the exchange rate is mostly freely floating.

Ize and Yeyati (2005) highlight that under the high dollarization, a central bank is limited to the volume of international currency reserves. Therefore, it cannot supply the economy with an unlimited amount of foreign currency, which puts pressure on the financial institution's credibility and leads to a self-fulfilling liquidity crisis. For instance, if the economic agents have doubts about the liquidity of the Georgian banking sector, it may lead to large withdraw of deposits. Thus, if the outflow of those deposits is very large, the banking sector may lose its liquidity in foreign currency so drastically that the central bank will not be able to restore it through foreign currency reserves (Ize and Yeyati 2005, pp.10,22-23). As a result, the reduction of high financial dollarization to the normal level will reduce the financial instability risks in Georgia, which is an important factor for long-term economic growth and stability.

Problem 3: ...Reduces efficiency of monetary policy

According to above discussed factors and results of dollarization, it is obvious that the high financial dollarization and its accompanying processes reduce the efficiency of monetary policy in several different ways. Firstly, it does not allow the economy to have a sufficiently flexible exchange rate, which means that the National Bank of Georgia is not able to keep the optimum balance between the inflation and economic growth under high dollarization. Reinhart, Rogoff, and Savastano (2003) highlight that the high dollarization increases the vulnerability of external shocks' influence on the Georgia's local economy, which negatively impacts the inflation rate and prevents economic growth. Moreover, the high financial dollarization prevents monetary policy to manage interest rates in the banking sector as Georgia only impacts the local interest rate rather than foreign one. Thus, the monetary policy is less efficient, which prevents the national bank to increase the trust of economic agents' and loses its power to facilitate macroeconomic stability.

Problem 4: ...Reduces the efficiency of the economy by negative externalities and moral hazard

Ize (2005) state that high financial dollarization causes negative externalities and a moral hazard. Despite the fact that deposits in local and foreign currency are equally insured, a high financial dollarization causes unfair privilege of foreign currency. In other words, the local currency appreciation reduces the risk premium of deposits for all depositors, while local currency depreciation increases the risk premium of deposits denominated in local currency, which lowers the credibility. Moreover, according Broda and Yeyati (2003) the foreign currency deposits create a systematic risk having more negative effects on local currency deposits. While making deposits in foreign currency become more attractive, monetary authority should try to increase the interest rate on Georgian Lari denominated deposits to make it more attractive among customers. However, the banking sector avoids costs of local currency and inclines more towards serving foreign currency deposits, which results a vastly high level of financial dollarization (Broda and Yeyati 2003, 19–22).

On the other hand, de-dollarization might be optimal for the whole economy, but, according to Duffy, Nikitin, and Smith (2006), it should be reached by all of the industries together. Although pricing in the local currency might seem optimal for the entire industry sector, if all companies do not change their pricing strategy synchronously, then separately

each construction company will not be willing to price their products in Georgian Lari. Thus, economy faces a "dollarization trap".

In case of Georgia negative externalities and moral hazard lead economic agents to dollarize their assets more. In particular as Kokenyne et al. (2010) discuss, in case of strong economic stability they benefit from paying a low interest rate on foreign currency, while in bad times and economic instability they share their losses and cost burden with the rest of the economy. Therefore, the high financial dollarization caused by negative externalities and the moral hazard is totally not an optimal choice.

Problem 5: ... Prevents international ratings from improving

The high level of financial dollarization prevents Georgia from improving its international ratings, which eventually hinders investments in the country. According to Fitch Ratings (2016) and Moody's (2016), lowering the deposit dollarization ratio will upgrade Georgia's financial strength ratings. Some level of dollarization might be used as a hedging instrument for investors as it mitigates the exchange risk and provides portfolio diversification option, especially in such a little economy as Georgia is. However, the high dollarization directly points out the weakness of country's macroeconomic policy and high economic instability. Moreover, according to Kokenyne et al. (2010) the financial dollarization increases more as foreign investors use dollar as a hedging instrument to manage foreign exchange rates. Therefore, the international rating can be improved if Georgia offers investors other investing possibilities, which will decrease the level of dollarization too.

3.2 What has been done so far?

In 2009 the National Bank of Georgia introduced the inflation targeting and actively started to implement other macro-prudential policies to de-dollarize economy. Figure 1 shows

that there have been activated standing facilities, like overnight loans and deposits, where interested rates were linked to the monetary policy rate. As a result, an interbank market liquidity³ has increased and improvement of fiscal administration caused higher current balances on GEL. However, according to the National Bank Statistics the amount of Lari in the economy is still low, which again negatively effects the financial dollarization level. The low amount of local currency is the reason why the government and the local macroeconomic institutions are trying to promote Larization, where the volume of loans denominated in Lari

FIGURE 1. MONETARY POLICY MEASURES: STANDING FACILITIES AND REFINANCING OPERATIONS



Source: National Bank of Georgia, 2018

is needed. However, when 63% of deposits are denominated in dollars, it is logical that the banking sector has a very large resource of Lari. Therefore, to get long term finances the Georgian banks has to transform the short-term liabilities into the long-term assets to get long-

³ The interbank market is very important for banks having deficits to meet their liquidity needs (Allen, Carletti, and Gale 2009).

term financial resources (i.e. deposits should be transferred into the loans). Nevertheless, beside the credit and operational risks the National Bank of Georgia faces the interest and liquidity risks, which prevents a maturity transformation process. Thus, if the bank has the ability to prevent those risks, it will be able to generate the long-term finances by issuing long-term loans with a market interest rate. Otherwise, the bank is obliged to issue loans on the shorter timeframes, which mostly are consumer-oriented and increases the people's debts, creates fewer job opportunities and negatively effects the economic growth. Making Georgian Lari "longer" banks need a sufficient amount of more reliable liquid assets, which are securities denominated in Lari issued by the state and international financial institutions.

According to the Georgian parliament, in 2019 a new pension reform has been entered into force, where the employee, the employer and the state treasury make minor contributions (each about 2%) into the funded pension. This new scheme will create a resource to finance the long-term assets for further economic profitability and stability. Moreover, the financial sector will also use it for the long-term government security purchases to create a long Lari and increase the availability of the local currency (Ministry of Economy and Sustainable Development of Georgia 2016). On the other hand, there are lots of issues regarding this new pension fund system about whether it will be effective to resolve the problem or not. There are lots of risks which prevent banks from lending to the small and medium businesses. The lender of the pension fund may also choose the same strategy as the banker refrain from crediting the real sector of the economy. Thus, the biggest part of the monetary resources will be used for purchasing the treasury liabilities and not for the lending to the private sector. Hence, it is not guaranteed that the new pension reform and developing capital markets will unconditionally create long money for the private sector.

4 The Empirical Results and Main Drives

There are different views about the financial dollarization, while in this chapter I will review the key theories and by regression analysis discuss how they explain the high dollarized economy in Georgia. There are several theories explaining the financial dollarization. Those include a portfolio view, market failure view and currency substitution view.

4.1 The Views and Theories

The portfolio view: The majority of people do not like to take risks, especially when it comes to the deposits and savings. According to Levy Yeyati (2005) investors try to hedge their risks by choosing the right portfolio. One of the efficient ways to mitigate the risk is a diversification. While the inflation rate effects the return on local currency, the fluctuations in the real exchange rate directly impact the return on dollar deposits. Thus, the investor avoids the negative effects caused by the changes in the exchange and inflation rates and tries to maximize return by minimizing the variance of portfolio.

Hence, using Ize and Levy Yeyati's (2003) approach the financial dollarization rate is clearly proportional to the inflation rate and exchange rate, which is clearly the case with the Georgian economy. According to their derived portfolio model the dollar share of the optimal portfolio is just variance of inflation over the covariance of inflation and exchange rates. In other words, if there are no changes in the nominal exchange rate and inflation, the real exchange rate will not change. This case is far from the real-world, but once the volatility of inflation rate increases, to save in local currency becomes riskier and less attractive. Therefore, targeting inflation has a positive effect on the level of dollarization. Moreover, the portfolio view also explains that Georgian local investors are more sophisticated as they know their local currency characteristics and try to mitigate the volatility of real returns. Therefore, the share of their deposits denominated in dollars is bigger than the foreign investors', which again leads financial dollarization to increase. In addition, on the level of whole country, where the amount of imports is quite high and the level of dollarization is high too, for the investor the exchange rate matters a lot and the correct monetary policy is an option.

The market failure view: Nothing is perfect. Those words also refer to a market, where there are a lot of imperfections. Country might fail to regulate its markets properly, which causes unexpected externalities. According to Burnside et al. (2001) due to the massive bankruptcies and high social cost, debtors can forecast better the future fails. Having wide negative externalities, the government fails to resolve the financial crisis in time efficiently. Thus, debtors minimize their expected losses by having their deposits denominated in dollars, which increases the value of the debtor guarantee. In addition, although there is a high interest rate on deposits denominated in the Georgian Lari, the default risk of it is much higher than the dollar borrower's, which again sets the borrower's preferences for taking deposits in dollars. Finally, the market imperfections lead the financial dollarization to increase.

The currency substitution view: Georgian currency Lari was adopted in 1995. Before 1997 it was pegged to dollars and Georgia had a fixed exchange rate. In those days, the fixed exchange rate was a good alternative and choice for the country as due to high inflation and instability people experienced a lack of trust in their national currency. Hence, pegging the exchange rate to dollars helped Georgian Lari to stabilize and people started to trust the Lari more. However, besides U.S., Georgia trades with other countries too which have different currencies and different exchange rates. Thus, in 1997 Georgia switched to a floating exchange rate regime that helped country to be more flexible. During the 2008-2009 crisis, the national bank of Georgia did not have a limited scope of actions and successfully tried to mitigate the negative influence of other economic crises and currency depreciations. Although the Lari now is not pegged to dollars, the currency substitution rate is high. The main reason is the past experience and general idea of Georgian people that the dollar will never "fade". However, having perfect substitute currencies means having the same inflation rates, where money demanders can use different currencies indifferently. However, US dollars are not perfect substitutes for Georgian Lari, but the cost of holding dollars is less than the Lari due to high inflation.

Even after years of inflation targeting and price stability, the memories of having high inflation in the past still impact people's expectations. People try to have portfolios with low inflation currencies and dollars are an important store of a value, which increases the volatility of exchange rate, leads to the further depreciation of the Georgian Lari and high level of financial dollarization. Thus, the high level of currency substitution is a weakness for a country with emerging economy like Georgia.

4.2 Data and Explanatory Variables

I now examine the economic significance of the potential determinants using quarterly data for Georgia between 1996:Q1 and 2018:Q4. Throughout the research, this is the longest quarterly time series data available to study dollarization in Georgia. The major part of the data comes from National Bank of Georgia and IMF, while some of it is taken from the World Bank data. There are mainly data constraints from 1996 to 2004, where the reason of missing values for different variables is different. However, the credibility of the data is not questionable. Table 1 provides some basic summary of descriptive statistics of the used data for analyzing the dollarization theories (For more descriptive statistics see Appendix Table A4). There are 75 observations and 9 listed variables, including deposit and loan dollarization ratio, the average past inflation, real exchange rate, real GDP per capita, dollar share of minimum variance portfolio values, real GDP growth and Country Policy & Institutional Assessment

(CPIA). For most of the variables mean and median are quite close showing that their data sets have a symmetrical distribution. The deposit dollarization and loan dollarization rates are quite similar, but still there is some heterogeneity in median and standard deviation.

Variable	Obs	Mean	Median	Std.dev
Deposit Dollarization rate (%), DDR	75	0.659	0.600	0.066
Loan Dollarization rate (%), LDR	75	0.692	0.700	0.096
Average Past Inflation, AVPI	75	5.099	5.00	3.944
Exchange rate (USD/GEL)	75	1.911	1.800	0.330
GDP real growth (%)	75	5.335	5.30	4.264
Real Effective Exchange rate changes (%)	75	117.90	119.90	8.184
Country Policy & Institutional Assessment (CPIA)	69	4.28	4.34	0.155
GDP per capita, GDPpc	75	2373.00	1589.00	1906.14
Dollar Share of Minimum Variance Portfolio (DMVP)	75	26277652	16739639	29483840

TABLE 1. DESCRIPTIVE STATISTICS

Note: The summary statistics are taken over all non-missing observations between 1996-2018; the values are measured in 2010 prices in GEL; growth rates are measured in %.

Measuring the Financial Dollarization is a subject of debate, because FD itself is not an independent issue and has strong correlations with other economic cases. For instance, according to Corrales and Imam (2019) calculating the dollarization ratio of the balance sheet of domestic financial institutions is very important to check the impact of financial dollarization on a probability of banking crisis. Moreover, checking the influence of financial dollarization on a monetary stability requires further statistical investigation into deposit dollarization ratio, composition of residents' savings and even the balance sheet effect propensity. On the other hand, Levy Yeyati (2005) state that measuring financial dollarization is very important but it has its limitations, which are practically related to data, its availability in terms of country, time and its degree of reliability.

As mentioned above, while this thesis assembles the primary data reported in the National Bank of Georgia and some IMF staff reports, it also discusses the previous empirical works by Levy Yeyati (2005). There are highly dollarized economies where deposit dollarization rate is more than 50%, while semi-dollarized economies have less than 50%. According to Ben Naceur et al. (2015) emerging market economies are not highly dollarized, while Georgia seems to be counted as a highly dollarized one. Figure 2 presents a box plot distribution of deposit dollarization in Georgia from 1996 till 2018. The value of median is 0.67 close to 70% and the data is skewed left, which gives us the insight that the local currency is not preferred as a main store value in Georgia.



FIGURE 2. DEPOSIT DOLLARIZATION IN GEORGIA BETWEEN 1996Q1 - 2018Q4





One of the characteristics of financial dollarization is its persistent nature. Therefore, to check its persistence level in the case of Georgia, I used the pooling model estimator on the deposit dollarization rate and included its lagged independent variable. The reason for this is the believe and the view that the current level of dependent variable (deposit dollarization ratio) is determined by its past level. The results are shown in Table 2. Although the country successfully managed to reach the macroeconomic stability after implementing the correct macroeconomic policies, the financial dollarization remains still high because of the previous

instability cases. This outcome can be explained by the Georgian population's general mentality that there is a lack of confidence and trust in domestic currency assets because of the deeply distressing experience of past currency devaluations, weak macroeconomic institutions, political instability, poor fiscal structure, past inflation and, I believe, post-Soviet mindset.

TABLE 2. FINANCIAL DOLLARIZATION PERSISTENCE

Dependent variable: Deposit Dollarization Ratio 1996:Q1 – 2018:Q4									
	Pooling Model								
	Estimate	Std. Error							
Deposit Dollarization Ration (lagged)	0.935352***	[0.026564]							
Intercept	0.045349*	[0.018119]							

Note: '.' significant at 10%; * significant at 5%; ** significant 1%; *** significant at 0.1% R-Squared: 0.91715

Adj. R-Squared: 0.91641

F-statistic: 1239.8 on 1 and 112 DF, p-value: < 2.22e-16

According to Levy Yeyati (2005) there is a strong evidence that credit dollarization and deposit dollarization are closely related and quit often move similarly. Hake et al. (2014) also conclude that the currency matching is an important issue for the lenders making a choice between local and foreign currency. Therefore, foreign currency loans are highly correlated with foreign currency denominated deposits, which again shows that there is a high funding in the foreign currency. Moreover, García-Escribano (2010) examines the main determinants of the Peruvian de-dollarization, where he uses the VAR model including inflation and exchange rate variability to describe the credit and deposit dollarization relationship. Thus, it is statistically obvious that FX regulatory policy has a strong impact on the degree of correlation of the deposit and loan dollarization. Looking from the supply side, high inflation increases incentives to increase deposits in foreign currency that at the same point increases the lending

in the foreign currency. Consequently, both the deposit and loan dollarization increase (Hake et al. 2014).

Currently, the deposit dollarization, calculated as a share of dollar-denominated deposits in total deposits, and loan dollarization levels, defined as a ratio of dollar-denominated loans to total loans, are persistently high in Georgia. Figure 3 charts a clear negative trend in both of these variables, meaning that the country gradually de-dollarizes its economy. Before 2008 the FD was decreasing, while during 2007-2008 there was a global financial crisis and Russo-Georgian War (the war between Russia, Georgia, the republics of South Osetia and Abkhazia), which negatively impacted Georgia, its economy and it is apparent that the dollarization rate has increased. However, later implication of the successful de-dollarization



FIGURE 3. FINANCIAL DOLLARIZATION: GEORGIA BETWEEN 2004Q1 - 2018Q4

policies and macroeconomic stability positively impacted and slightly decreased the level of the FD. Nevertheless, in 2012 the new government was formed, where the elections and high spending increased the inflation. Moreover, between 2014-2017 the Russian financial crisis again negatively impacted the Georgian economy, the exports decreased by 25%, the average economic growth rate decreased and reached 3.5%. Thus, the dollarization rate slightly

increased and only after 2017 started to reduce again. Finally, in 2018 the level of deposit dollarization was 63%, while the credit dollarization rate reached 55%. After making the Dickey-Fuller unit root test the results show that the deposit and loan dollarization rates possess unit roots (See Appendix Table A5).

In 2017 the Larization Plan⁴ was launched and since then 33000 loans (received in US dollars before January 2015 and singed for against the real estate collateral) have been identified to be converted into Lari. As a result, compared to 2017 the volume of loans issued by Georgian commercial banks in local and foreign currency increased by 19.5% and 15.5% accordingly. Additionally, the share of loans in foreign currency has decreased by 9% and reached 55%. On top of that, as can be seen in Figure 4, the demand for the national currency



FIGURE 4. ANNUAL MARKET INTEREST RATES ON LOANS IN GEORGIA

has increased and the annual market interest rate on loans reduced and reached 11.7%, which is 0.7% less compared to the rate in 2017. Moreover, according to the statistical data of the National Bank of Georgia (NBG), the annual market interest rate on loans issued in Lari

⁴ The program on Larization of loans intends to convert US dollar denominated banks loans, which are collateralized by real estate, into Lari. NBG, 2017.

decreased by 1.1% and reached 15.7%, while the same rate for loans issued in dollars decreased by 0.3% and reached 7.6%. Although the interest rates decreased both on loans to individuals as well as to legal entities and the gap between them is quite significant. Thus, a borrower prefers to take more loans in dollars than in Lari as long as they are cheaper (See Appendix Figure A5). Additionally, under a high volatility of inflation rate there are less incentives to take loans in national currency. However, the high interest rate on domestic loans motivates the local banks to lend more and keep the low interest rate on the foreign currency loans to have a profit through gaining more market share.

4.3 Regression Analysis

There have been a lot of studies about dollarization and its determinants. Although the studies and tests analyze the financial dollarization theories, there is a lack of research analyzing the case of Georgia or the results suffer from limited data availability. This subchapter summarizes the country's main internal and external determinants. Here I would like to check whether common sense of those theories is supported by the data. To get the results, I regressed the deposit dollarization ratio on a set of variables and controls to check the key determinants of financial dollarization.

The main hypothesis that this thesis tries to check through the regression is that the past inflation plays a bigger role causing the financial dollarization rather than current inflation level. In other words, the high inflation rates influence the future expectations and drives people's decisions. Therefore, the expected inflation impacts the currency substitution phenomenon. According to Savastano (1996) and Burnside et al. (2001) in the 90s the domestic residents allocated their foreign currency holdings based on the return considerations and future risk associated with their local currency, which was mainly driven by the long period high past inflation levels. Consequently, changing any behavior takes longer as it requires significant

and stable pattern of the past data. Thus, the long period of appreciation is needed to increase the trust in the local currency. For that reason, I checked the hypothesis that the financial dollarization in Georgia is a clear response to the past inflation and not the current one.

In addition to the other empirical paper results about the financial dollarization, the thesis uses the approach of Levy Yeyati (2005), who analyzes the three main views explaining the currency substitution as the financial dollarization phenomenon - a portfolio view, a market failure view, and an institutional view – which were discussed above (See section 4.1).

The view about the causes of financial dollarization are mentioned above. Thus, I conduct a co-integration analysis to find out the impact of financial memory on the level of financial dollarization. I used an Ordinary Least Squares regression (OLS) to analyze the main determinants of a deposit dollarization and regressed the deposit dollarization ratio on some explanatory variables of my choice. Based on the literature review, all suggested variables are included in the model as a control variables, such as, real GDP per capita, the average past inflation, dollar share of minimum variance portfolio values, real GDP growth, real exchange rate and Country Policy and Institutional Assessment index. Consequently, the examined linear model is the following:

$$Yt = \beta_0 + \beta_1 * avp_{inf_t} + \beta_2 * doll_mvp_t + \beta_3 * GDP_pc_t + \beta_4 * GDP_gex_t + \beta_5 * cpia_t + \epsilon it$$

 β_0 is a constant, while later I include all control variables one by one. To support the currency substitution view in the regression I used the change of average past inflation (avp_inf) since 2004 as a control variable, because the trend of past inflation has a big influence on people's decision of making a choice between savings in local and foreign currency. This variable is taken in its levels rather than in logs, which helps to decrease the bias of not considering the years when there were the negative inflation rates. Thus, I expect coefficient $\beta_1 > 0$, which implies that positive change in average past inflation increases the deposit

dollarization. While to support the portfolio view the regression includes the logs of the dollar share of the minimum variance portfolio (doll_mvp). For this variable, I expect that β_2 will be significant and will have a positive sign for Georgia explaining the fact that when dollar share in the constructed portfolio decreases, deposit dollarization ratio should reduce.

The size of an economy plays a huge role in terms of the strength and development of the local currency. For that reason, the regression includes the initial GDP per capita in constant prices to capture the impact of institutions and economy itself (GDP_pc). To test the market failure view, the regression includes the variable measuring the correlation between the GDP real growth and the real effective exchange rate, which captures the probability of the default on the market (GDP_gex). According to Levy Yeyati (2005) the increase of procyclicality of real exchange rate increases the dollarization bias. Different from the average past inflation, to better test the institutional view I have included the Work Bank's assembled CPIA index (cpia), which is a coefficient capturing the Georgia's governance indicators assessing the country's policy and institutional decisions based on twenty different components including level of corruption and issues related with macroeconomic policies. For this variable, the coefficient should be negative, because as government develops the deposit dollarization ratio decreases.

Before running a regression, to avoid the multicollinearity issues I have done some tests. One of the important steps is checking the correlation between the variables to identify highly correlated pairs for further investigation and if necessary exclude them from the regression analysis. I wanted to include the export or import as an explanatory variable as the increase of net export has a positive impact on GDP growth and, thus, it might decrease the level of dollarization. However, after constructing the Pearson's correlation matrix (See Appendix Table A6), the correlation between the GDP per capita and those variables are about 1, which is high. Moreover, high correlation between dollar share of the minimum variance portfolio and NX causes problem of endogeneity too. Hence, to reduce the biased results I have not included them in the regression. I have left only the GDP per capita, which captures all the growth of the economy, and the dollar share of the minimum variance portfolio, which has a high significance and as an explanatory variable is important for making final statements.

Table 3 illustrates the OLS regression results. As expected, regression one (column 1) shows that there is a significant relationship between the deposit dollarization ratio and the average past inflation. While after including the dollar share of the minimum variance portfolio (column 2), the connection between the dependent variable and the average past inflation weakens because for most of the people the real returns have a bigger influence than the inflation rate. Obviously, people pay more attention to the values of the real returns in each currency rather than the macroeconomic policies expressed by the inflation rate. In Table 3 although the initial GDP per capita has been added in the regression three (column 3), which has a significant coefficient, the past average inflation coefficient is still insignificant. Thus, there is a negative relationship between the GDP per capita and deposit dollarization rate. In other words, as the economy grows and the amount of the income per capita increases, people save less or prefer saving in their local currency rather than in dollars.

After adding the variable measuring the procyclicality of the real exchange rate, the regression four (column 4) explains the model better, as the adjusted R-square increases and the coefficient of the recently added variable is significant too. These results could be explained by the endogenic factors capturing the institutions' decisions, which effect the financial dollarization, but it is not fully shown by the deposit dollarization. For instance, financial dollarization can positively impact the real exchange rate and due to its increase effect the economic activity, which again indicates the stronger procyclicality of the real effective exchange rate.

_	Dependent variable:									
			Deposit_do	ollarization	_rate					
_	(1)	(2)	(3)	(4)	(5)	(6)	(7)			
avp_inf	0.124**	0.101	0.357	0.226**	-0.224	0.194	-0.233			
	(0.027)	(0.012)	(0.081)	(0.050)	(0.059)	(0.072)	(0.065)			
doll_mvp		0.033***	0.056***	0.050***	0.109***	0.88^*	0.067***			
		(0.007)	(0.010)	(0.011)	(0.036)	(0.016)	(0.019)			
GDP_pc			-0.027***	-0.022***	-0.031***	-0.028				
			(0.000)	(0.003)	(0.020)	(0.014)				
GDP_gex				-0.052**	-0.047**	-0.050**	-0.018*			
				(0.020)	(0.021)	(0.034)	(0.019)			
cpia					-0.201*		-0.147**			
					(0.057)		(0.073)			
export						-0.071	-0.109***			
						(0.015)	(0.018)			
Constant	0.636***	0.550***	1.548***	1.452***	1.645***	1.265***	1.053***			
	(0.012)	(0.117)	(0.155)	(0.152)	(0.133)	(0.102)	(0.090)			
Observations	75	75	75	74	69	69	69			
\mathbb{R}^2	0.071	0.298	0.386	0.436	0.584	0.375	0.478			
Adjusted R ²	0.059	0.279	0.360	0.404	0.543	0.336	0.437			
Residual Std. Error	0.064 (df = 73)	0.056 (df = 72)	0.053 (df = 71)	0.051 (df = 69)	0.038 (df = 62)	0.046 (df = 64)	0.042 (df = 63)			
F Statistic	5.618^{**} (df = 1; 73)	15.314 ^{***} (df = 2; 72)	14.889^{***} (df = 3; 71)	13.347^{***} (df = 4; 69)	14.491^{***} (df = 6; 62)	9.593 ^{***} (df = 4; 64)	11.558^{***} (df = 5; 63)			
Note:						*p**p	o****p<0.01			

TABLE 3. FINANCIAL DOLLARIZATION DETERMINANTS

In the regression model 5, when I have included the Country Policy and Institutional Assessment index variable, the R-square of the model is higher, all the main explanatory variables are significant and have the expected sign. Although the CPIA variable is not very significant it's negative sign shows that when country improves institutionally, runs the better macroeconomic policies, develops its economy and increases macroeconomic stability, the

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deposit dollarization automatically decreases. In the Table 3 column 6 and column 7 check that the increase in export and developing its market, Georgia can decrease the financial dollarization. The coefficient of an initial level of export (mill GEL) (see column 6) has a negative sign, which shows that if the export of the country increases it will reduce the deposit dollarization ratio. However, the coefficients for the export and GDP per capita become insignificant, which is caused by a high correlation (0.945) with those two variables. Moreover, there is a high correlation between export and doll_mvp variable (0.877), which makes dollar share of the minimum variance portfolio less significant (See Appendix Table A6). Again, to check this case, after regressing the data without GDP per capita (column 7), the coefficients of export and doll_mvp became more significant.

It is worth mentioning that all of the included coefficients have the signs I expected and they are significant. Although the coefficient of the average past inflation is not always significant, its importance and influence on the deposit dollarization is quite high (Table 3, column 1). The power of the institutions significantly drives the financial dollarization level. In other words, macroeconomic institutions influence the financial dollarization through setting up the inflation. The government rapidly increases the money supply causing inflation to rise and money lose the purchasing power. This again confirms the argument of Rajan (2004) that during the economic recessions most of the countries with weak fiscal authorities use the inflation tax to finance their spending.

Finally, the analyzed data supports the portfolio view as the coefficient for the dollars share of minimum variance portfolio always maintained highly significant through running the regression by adding the different variables. The significance of the GDP per capita coefficient and its negative sign also show that the country requires the development of the local currency markets, which will definitely, decrease the level of dollarization in the economy. However, the estimation results of the explanatory variables reveal that institutional view is also supported. The weakness of the institutions negatively impacts the financial dollarization as the macroeconomic authorities cannot sustain the economic credibility by low interest rates, low inflation and low repudiation expectations.

4.4 Robustness Check

According to the general rule of thumb while using the OLS regression for the analysis, there might be some outliers and high leverage data points. However, I have decided that those data points are important and are not some entry errors or outliers that should be excluded from the further regression analysis. For further analysis, I have done the robustness check and constructed the Robust regression using the method of iterated re-weighted least squares (IRLS). In OLS regression the robust regression will show the weights of the data points to check if those observations behave well. To avoid the bias conclusions, I have made two regression models by two different weighing methods: Huber and Bi-square. Firstly, before constructing the robust regression, I have done some tests analysis of OLS regression through examining residuals, its fitted values, their level of leverage and Cook's distance⁵. The analysis showed that there are some observation points (14, 25, 30), which I have displayed and found that those are points in GDP per capita variable that have relatively large Cook's distance values (See Appendix Figure A6).

For further investigation to find out if those observations are problematic I run the robust regression (See Appendix Table A8). The results showed that the weight of the observation increases when the absolute value of residuals decreases. Thus, data points with large residuals are down-weighted. However, in this data all observations tend to have weight

⁵ An estimate measuring the influence of the observations in OLS regression analysis.

about 1 or equal to 1, which shows that the results of the initial OLS regression and the robust regression are very similar. Secondly, to recheck the results, again I have constructed robust regression by the same IRLS model but this time I have used bi-square weighting method. The calculated weights differ from the Huber ones. However, all of them are close to 1 again.

Even though the significance levels of coefficients are slightly different from the OLS regression results, the signs of the independent variables did not change. Particularly, in the IRLS model the cpia index is less significant than in the OLS model. However, still it has some impact on the deposit dollarization, which is logical as the economic development and political stability increases the trust of people in Georgian currency; thus, decreases the level of deposit dollarization. Even though the significance levels of coefficients are slightly different from the OLS regression results, the signs of the independent variables did not change. To conclude, the control variable weights are more or less constant showing that the initial OLS regression's and the robust regression's results are not different. Therefore, the OLS regression I constructed is a good approximation of the deposit dollarization in actual Georgia (See Appendix Table A9).

5 Conclusion and Policy Recommendations

This thesis examined why the idea "in dollar we trust" is very strong in Georgian population and showed that there are different drivers of deposit dollarization. The empirical analysis reveals that the lack of trust in local currency caused by political and macroeconomic instability (expressed by inflation volatility) is a key determinant. The regression results support the portfolio view, where the influence of the average past inflation increases people's doubts towards the Georgian Lari and its economy. Moreover, the institutional view implying the strength and stability of macroeconomic institutions is important for further economic development, which will increase the trust in Georgian economy.

Galindo and Leiderman (2005) highlight that strong monetary and fiscal policies have a positive impact on macroeconomic stability. In this process, the de-dollarization plays an endogenous outcome. However, although the healing process is crucial for an economy, it is not very easy, quick or always successful. In particular, if we consider the case when the specific economy gains macroeconomic stability and a high bank ranking, legal entities go for a foreign currency findings on international markets as it becomes cheaper and the liability side dollarization increases. The process is like a two-sided scale, where the perfect balance needs slow and careful approach.

Georgia has introduced some prudential regulations, such as the effective supervisions on banks to disclose the foreign exchange loans related risks, a mandatory conversion of foreign currency deposits into domestic ones, limitations on foreign currency borrowing, and restrictions to use only local currency for listing prices of services and goods. However, most of the regulations are part of the forced de-dollarization process, which according to Kokenyne et al. (2010, 14–15) should be accompanied with a strong macroeconomic stabilization plan. In case of Georgia the economic analysis showed that a high level of dollarization is driven by demand side factors. Therefore, the effective de-dollarization policy recommendations should be mainly market-based, such as building trust in the economy, developing the domestic financial market, and implementing the new macro prudential measures.

Building trust in the economy. Depositors and investors should trust the long-term future of the Lari. They should believe in Georgia's economic growth and its proper economic policy. Long-term money, long-term finances basically are meant to finance investment projects, which lead to new opportunities and companies' growth. In recent years, the National Bank of Georgia and the Ministry of Finance have actively been using different tools to support a long-term Lari. One of the implemented effective tools is introducing corporate bonds (repo transactions) that are denominated in the local currency. Moreover, the government should run an active public debt management and issue an international bond denominated in Georgian Lari. That will change the behavior of the private sector to invest more in indexed instruments rather than in deposits or loans denominated in foreign currency.

In addition, under the stable inflation and stable prices developing the capital markets will be a huge step towards the introduction of local nominal non-indexed instruments. According to Goldstein and Turner (2004) emerging economies should prioritize developing domestic bond markets, which encourages the availability of hedging instruments, and through proper open economy try to reduce the entry barriers for foreign-owned banks. However, Kokenyne et al. (2010) argues that for a country, where investors do not have a high demand to take risks by investing in local currency, the active public debt management and high interest rate on the government debt might increase the debt service. Nevertheless, according to the National Statistics Office of Georgia and the World Bank data, the foreign direct investments (FDI) have a positive trend (See Appendix Figure A7) showing that the Georgia is very attractive for investors. Thus, developing the local financial market will be very successful.

Developing the domestic financial market. This policy recommendation goes handin-hand with the above mentioned one. Currently, Georgia does not have a proper local financial capital market, which will be a huge interest of foreign and domestic investors as Georgia recently has been very attractive in terms of investments. However, according to Kokenyne et al. (2010) the increasing the variety of financial instruments and investment opportunities in Georgian Lari will gradually decrease the dollar-denominated assets. Actually, the newly introduced Georgian pension fund (discussed in the chapter 2) is also a step forward for developing the domestic investor base as it will support a longer-term Georgian Lari instruments. In addition, Georgia can follow Israel and introduce inflation indexed bonds, where indexation system is in local prices, which promotes the Lari (See Offenbacher (2002) more about Israel).

Implementing new macro prudential measures. There are additional macro prudential measures that can be introduced to successfully contribute to the de-dollarization process of the financial system. For instance, according to Basel III monitoring liquidity risk tools, the National Bank of Georgia can implement a regulation where the non-resident deposits which exceed 10% of total deposits should be guaranteed with more liquidity in bank's balance. This tight regulation will increase banks' liquidity and capital buffers. In order to reduce the cyclical and structural risks there should be some regulative instruments implemented in the assets' and liabilities' side. The unhedged borrower should have restrictions and limits to borrow in foreign currency. The National Bank of Georgia has to limit short-term loans as there are vast of opportunities taking loans in local–currency. Those limitation instruments can be implemented according to the Recommendation of the European Systemic Risk Board on Lending in Foreign Currencies (2011). These tools will support de-dollarization process.

On the other hand, the National bank of Georgia has to make changes in the liabilities side. Short-term funding in dollars makes the banking system more vulnerable. To reduce the

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vulnerabilities foreign-currency deposits should have longer maturities. In addition, certificates of deposits can also help this issue. For that reason, the National Bank of Georgia can differentiate the requirements of FX reserves and treat local-currency liabilities more favorably, i.e. introduce the minimum average liquidity ratios that will be more beneficial regulations for local-currency liabilities than in foreign-currency (International Monetary Fund. 2015b, 11). However, Georgia has started to adopt those liquidity coverage ratios and introduced loan-to-loan value ratios too, which are very important for maintaining the financial sustainability in the banking sector. Moreover, it is worth mentioning that according to IMF (2015a) the NBG also has been updating the crisis management framework and the banking resolutions, which aim to help nonbanking financial sector to grow as it leads to better protection and resilience.

Last but not least, global factors and the external drivers have to be considered through the de-dollarization process. The most influential exogenous indicators are world interest rates and risk-aversion in financial markets. When both of them increase, financial dollarization is expected to rise. Therefore, the country should be opened to global factors as it helps dedollarization process. According to Catão et al. (2016) the most effective and competent way to decrease dollarization level in economy is by using persuasive macroeconomic policies that are combined with inflation targeting rates. However, those policies should be connected with external conditions that are favorable for Georgia.

To conclude, Georgia is a developing country, which after the Rose Revolution in 2003 has successfully grown due to effective economic and democratic reforms. There is a very growth-friendly environment with a very low level of bureaucracy (Transparency International 2013), high level of business transparency, low taxation, open democracy and high level of economic freedom. Although the past inflation legacy, economic volatility and political instability drives people to trust less their local currency, Georgia has the capacity to increase the level of macroeconomic stability and the confidence towards the Georgian lari, and thus decrease the level of financial dollarization.

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Appendix

Variable	Obs	Mean	Median	Std.dev	Min	Max	1st	3rd
							Qu.	Qu.
Deposit Dollarization rate (%)	75	0.659	0.600	0.066	0.6	0.8	0.6	0.7
Loan Dollarization rate, (%)	75	0.692	0.700	0.096	0.5	0.9	0.6	0.7
Average Past Inflation, AVPI	75	5.099	5.00	3.944	-1.9	13.3	2.15	8
Exchange rate	75	1.911	1.800	0.330	1.4	2.7	1.7	2.15
Log_Dollar Share of Minimum Variance Portfolio, DSMVP	75	16.60	16.63	1.022	14.42	18.83	16.15	17.29
GDP real growth (%)	75	5.335	5.30	4.264	-8.7	13.9	2.9	7.85
Real Effective Exchange rate changes (%)	75	117.90	119.90	8.184	94.4	130	111.3	123.8
Country Policy & Institutional Assessment (CPIA)	69	4.28	4.34	0.155	3.82	4.37	4.34	4.37
GDP per capita, GDPpc	75	2373	1589	1906	768	7969	1308	2036

TABLE A4. DESCRIPTIVE STATISTICS

Note: The summary statistics are taken over all non-missing observations between 1996-2018; the values are measured in 2010 prices in GEL; growth rates are measured in %.



FIGURE A5. ANNUAL MARKET INTEREST RATES ON LOANS IN GEORGIA BETWEEN 2005-2019

Standard unit root test:

$$Y_t = \alpha + \beta t + \varphi Y_{t-1} + \varepsilon_t$$

where I would like to check if $\varphi = 1$ or not. Simply to test the regression coefficient in the linear regression I used the student test.



Call:

 $lm(formula = z.diff \sim 0 + z.lag.1)$

Residuals:

Min	1Q	Median	3Q	Max
2.1672	-0.6380	-0.1099	0.5925	2.6553

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
z.lag.1	-0.01951	0.01848	-1.056	0.293

Residual standard error: 0.9063 on 113 degrees of freedom

Multiple R-squared: 0.009764, Adjusted R-squared: 0.001001

F-statistic: 1.114 on 1 and 113 DF, *p-value:* 0.2934

Result: The current Student's *t* value is -1.055546, while the critical values (99%, 95%, 90%) are (-2.575829; -1.959964; -1.644854) accordingly. Comparing the Student's t value to the critical values, we see that statistic value -1.056 exceeds those values meaning that the series are not stationary. Thus, I cannot reject the assumption that $\varphi - 1 = 0$, showing that there is some unit root between the current variables (deposit dollarization and loan dollarization ratio).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11) (12)
GDP_pc	1										
GDP_reg	-0.07	1									
exc_rate_usd_gel	0.13	-0.12	1								
ch_r_effect_FX	0.16	-0.49	0.10	1							
avp_inf	-0.10	0.43	-0.19	-0.55	1						
doll_mvp	0.47	-0.21	0.47	0.33	-0.24	1					
export	0.95	-0.09	0.16	0.31	-0.21	0.48	1				
import	0.97	-0.08	0.09	0.29	-0.16	0.86	1	1			
Dep_doll_rate	-0.12	-0.02	0.11	-0.54	0.29	-0.12	-0.26	-0.25	1		
Loan_doll_rate	-0.17	0.12	-0.67	-0.51	0.22	-0.45	-0.29	-0.24	0.40	1	
GDP_gex	-0.01	-0.22	-0.39	0.35	-0.12	-0.11	0.04	0.06	-0.29	0.22	1
cpia	0.15	-0.49	0.20	0.78	-0.48	0.36	0.28	0.27	-0.49	-0.52	0.43 1

TABLE A6. CORRELATION MATRIX

TABLE A7.	CORREL	ATION	MATRIX	P-V	ALUE
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	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11) (12)
GDP_pc	NA										
GDP_reg	0.56	NA									
exc_rate_usd_gel	0.28	0.32	NA								
ch_r_effect_FX	0.19	0.00	0.41	NA							
avp_inf	0.40	0.00	0.11	0.00	NA						
doll_mvp	0.00	0.08	0.00	0.01	0.05	NA					
export	0.00	0.48	0.20	0.01	0.08	0.00	NA				
import	0.00	0.49	0.44	0.01	0.18	0.00	0.00	NA			
Dep_doll_rate	0.34	0.86	0.39	0.00	0.01	0.33	0.03	0.04	NA		
Loan_doll_rate	0.16	0.32	0.00	0.00	0.07	0.00	0.02	0.05	0.00	NA	
GDP_gex	0.95	0.07	0.00	0.00	0.33	0.37	0.74	0.61	0.02	0.07	NA
cpia	0.21	0.00	0.09	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00 NA

IRLS model by Huber Weights					IRLS model by Bisquare Weights		
	GDP_pc	resid	weight		GDP_pc	resid	weight
2	1004.7	0.117719535	0.7426628	2	1004.7	0.11529502	0.7258102
1	839.1	0.117121375	0.7464558	1	839.1	0.11460651	0.7288175
3	1104.2	0.026366143	1	23	1315.2	0.08469347	0.8465941
4	1167.5	0.026966735	1	25	5118.3	0.08105722	0.8589906
5	4115.6	0.029958824	1	68	2052.8	-0.07586173	0.8759047
6	921.3	0.034818839	1	14	1462.3	-0.07524835	0.8778361
7	1081.7	0.022514095	1	22	1235.2	0.07200436	0.8878407
8	1221.3	0.009696928	1	30	5478	0.07076487	0.8915571
9	1304.6	0.022086273	1	63	1979.8	-0.07053838	0.8922279
10	4529	0.031478978	1	12	1232.8	-0.06917346	0.8962444
11	1032.5	0.02121335	1	24	1465.1	0.06884239	0.8972134
12	1232.8	-0.06780158	1	16	1149.2	-0.06800573	0.8996252
13	1397.8	-0.065199413	1	21	1102.8	0.06741675	0.9013172
14	1462.3	-0.073291849	1	13	1397.8	-0.06637739	0.9042556
15	5125.3	-0.055273685	1	17	1340.9	-0.06555891	0.9065439

TABLE A8. ITERATED RE-WEIGHTED LEAST SQUARES (IRLS)

FIGURE A6. RESIDUALS, FITTED VALUES, LEVERAGE AND COOK'S DISTANCE



	D	Dependent variable: Deposit_dollarization_rate		
	Depo			
	(1) Huber	(2) Bi-square	(3) OLS Model	
avp_inf	0.209^{*}	-0.260*	-0.224	
	(0.042)	(0.019)	(0.059)	
doll_mvp	0.081^{**}	0.098**	0.109***	
-	(0.020)	(0.031)	(0.036)	
GDP_pc	-0.019***	-0.037***	-0.031***	
	(0.001)	(0.021)	(0.020)	
GDP_gex	-0.043**	-0.046**	-0.047**	
	(0.021)	(0.023)	(0.021)	
cpia	-0.198*	-0.184	-0.201*	
	(0.040)	(0.067)	(0.057)	
Constant	0.933***	1.232***	1.645***	
	(0.014)	(0.019)	(0.133)	
Observations	69	69	69	
Residual Std. Error ($df = 64$)	0.065	0.064	0.038	
Note:			*p**p***p<0.01	

TABLE A9. ROBUST REGRESSION - IRLS MODEL

FIGURE A7. FOREIGN DIRECT INVESTMENTS IN GEORGIA BETWEEN 1996-2018

