

Empirical Study on Dollarization in Vietnam

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ABSTRACT

The research is aimed at investigating the facts and determinants of dollarization in Vietnam in the period of 2010-2019. Additionally, the monetary policies implemented by the government and the State Bank of Vietnam are assessed to find their contribution to the success of de-dollarizing in Vietnam. The empirical test is carried out with 120 observations using OLS model. Key findings are: (i) inflation, exchange rate and USD deposit rate have positive impacts on the dollarization in Vietnam; (ii) consumer price index has negative impact on the dollarization; (iii) the two variables of imports and foreign direct investment are not significant, which is different from other previous studies. This may come from the fact that Vietnam is very active in importing and attracting foreign investment, and external investors do not worry about dollarization situation in Vietnam. Some recommendations to the Government and the State Bank of Vietnam are proposed to reduce dollarization in Vietnam to strengthen the reputation and belief on Vietnam dong.

Keywords: Asset substitution, Currency substitution, Devaluation, Dollarization, Vietnam

INTRODUCTION

For the last two decades, with the strong global economic development and the increase in foreign capital investments among countries have led to the rising in replacing the domestic currency by other foreign currencies as a means of payment, unit of account and store of value (Musse

and Echchabi, 2017). Some foreign currencies are widely accepted by other different countries, but U.S dollar is the most popular one, which accounts for the highest proportion (about 70%) of world trade turnover (Le T.M.H, 2009). Therefore, this process of substituting currency is often called the dollarization phenomenon. Dollarization is considered as one of the most noteworthy challenges among numerous of difficulties for a nation's economy and monetary policies (Vestnik, 2017). Dollarization played an extensive role in the process of globalization during the last twenty years (Botta, 2020). According to Huynh, Q.K (2020), dollarization commonly occurs when people lose their confidence in the national monetary policies due to a long period of unstable inflation rate and the rate continues to move negatively, coupled with the falling in the exchange rate. These reasons cause an increase in the cost of hedging for nominal assets in the local currency, meaning that property owners have to spend more money to ensure the safety of their assets against the volatility of exchange rate. In other words, the value of the domestic currency is going down, which leads people to convert their assets to another stable currency (such as USD) and start to use foreign currency as a store of value.

The situation of dollarization becomes more seriously when real transactions in the economy are also dollarized (Rossini et al., 2016). Therefore, the problem of

dollarization has motivated a large number of economic researchers to evaluate as well as analyze the level of dollarization among countries, the determinants of dollarization, the causes and solutions of it and other several features Calvo and Végh (1992), McKinnon (1997) Sarajevs (2000), Basso et al. (2007), Mwase and Kumah (2015), Naceur et al. (2015), Pham, T.H.A (2017), Bannister et al. (2018), Asep et al (2021), Nguyen (2021).

Vietnam has been facing with the occurrence of dollarization, arises from the transition from centralized and subsidized mechanisms to socialist-oriented market mechanisms. Several researches have investigated the situation of dollarization in Vietnam, such as Nguyen and Hauskrecht (2004); Le, T.M.H (2007), Do, T.P (2010); Nguyen, T.H (2011) and Pham, T.H.A (2017). Key findings of these studies agree that Vietnam is an unofficial dollarization economy or Vietnam is just partly-dollarize, and Vietnam is trying to prevent the rise of dollarization to improve financial stability and autonomy.

Although dollarization problems have been paid attention worldwide, few researches did on dollarization in Vietnam. In addition, these studies in Vietnam used descriptive statistical analyses and not updated. Therefore, the study “The dollarization in Vietnam in the period 2010-2019” is carried out to fill in this research gap. The timeline of 2010-2019 was chosen for this research because: (i) Vietnam faced with high dollarization situation after global financial crisis – 20% of total deposit were foreign currencies; (ii) The strong regulations for limiting dollarization were issued in this period, of which the regulation on 0% interest rates with USD deposit mobilization in 2015 was the key milestone.

Overall objective of this research is to understand the dollarization in Vietnam for reducing it in the future. To meet this objective, the following research questions should be answered:

- (i) How has the dollarization trend in Vietnam been changing in period 2010-2019?
- (ii) What are the main determinants of dollarization in Vietnam?
- (iii) What have been done to de-dollarization in Vietnam?
- (iv) What should be done to reduce the dollarization problems in Vietnam in the future?

LITERATURE REVIEW

Overview of dollarization

Currency substitution and dollarization have occurred in numerous countries over the world. Currency substitution was referred to as a case in which the local currency demand was affected by foreign economic variables (Tanzi and Blejer, 1982; Poloz, 1984; Marquez; 1985a, 1985b; Neldner, 1987; Bana and Handa, 1990; and Rogers, 1990). Currency substitution happened due to the relatively low opportunity cost of holding both domestic currency and foreign one.

The definition of “dollarization” was mentioned based on the term of currency substitution. In 1983, Ortiz interpreted dollarization as the percentage of actual financial transactions which were traded in foreign currency in comparison with those traded in domestic money. In 1989, Lamdany and Dorlhiac characterized dollarization as a legal change of the national currency by a replacement currency (such as U.S dollar), which was enacted by the authorities. Further, Calvo and Végh, (1992) expressed when a foreign currency was only used as a medium of exchange, the definition of dollarization was next applied when people used a foreign currency as a store of value or unit of account.

Classifications of dollarization

Dollarizations can be classified in different ways.

First of all, based on the level of legality, dollarization includes three levels: official dollarization, semi-official dollarization and unofficial dollarization (Connie Mack,

1999; Heysen, 2005; Le T.M.H, 2009, Feige et al., 2000). “Official dollarization” is denoted when a foreign currency is presented legally in a country (Yeyati, 2014). Normally, official dollarization is only applied when a country has failed to enforce its monetary policies (Connie Mack, 1999). Some countries are facing with official dollarization: Ecuador, Panama and Salvado. Next, “semi-official dollarization” related to the case when another foreign currency is legally circulated besides the national currency. It acts as a secondary role of taxes, wages payments and daily consumer transactions. Countries with semi-official dollarization still maintain their central banking system to carry out their monetary policies. Lastly, “unofficial dollarization” referred to the circumstance when a foreign currency is widely used in an economy to perform functions of domestic currency, even though it is not officially recognized by the authorities of that country (Le T.M.H, 2009). Vietnam is an example of unofficial dollarization country – although the government and the State Bank of Vietnam prevent people from using U.S dollar in payment transactions, Vietnamese still can deposit their USD in domestic commercial banks.

Second, based on the size of using foreign currency in an economy, dollarization includes two forms: direct and indirect (McKinnon, 1997; Nguyen and Hauskrecht, 2004). “Direct dollarization” means that there is a competition to be a means of payment between two or more currencies in the same territory. People tend to use in balance both these two currencies in daily transactions and can freely switch between them. On the other hand, “indirect dollarization” can be understood as the investors’ converting between non-monetary financial assets into another foreign currency which indirectly affects the demand for domestic transactions.

Measurements of dollarization

There are three ways to estimate the rate of dollarization, including:

- The ratio of the foreign currency reserves to the total reserves of the economy (in the form of saving deposits): **FCD/M2**
(FCD: foreign currency deposits; M2: broad money)
- The ratio of foreign currency loans to total loans: **FCL/TL**
(FCL: foreign currency loans; TL: total loans)
- The ratio of transactions listed in foreign currency to total transactions.

However, the International Monetary Fund (IMF) indicated that FCD/M2 is the main measurement of dollarization. If this ratio is higher than 30%, that economy is considered to be highly-dollarized. This indicator is also used in the studies of Nguyen, T.H (2011) and Pham, T.H.A (2017).

Determinants of dollarization

Dollarization is determined by several factors.

Inflation

The high inflation is demonstrated as one of the most common reasons that cause dollarization problem in an economy (Rossini et al., 2016 and Vestnik, 2017). In 1999, Schuler investigated that the origin of Indonesia’s dollarization was because of hype-inflation. As per Freitas (2004), a temporary upward trend in the rate of inflation could reflect a long-term use of foreign currency in that country. Moreover, in 2012, Vieira et al. applied the GMM method based on a sample of 79 developing countries to find out that: from the default expectations of investors, dollarization was a sensible response to the expected inflation in highly indebted countries.

Loans and deposit levels

Naceur et al (2015) found out the causes of dollarization of loan and deposit in the Caucasus and Central Asia (CCA) during the period of 2001Q1-2014Q1. With D-GMM (Difference-GMM) estimator for the analysis, the finding was: financial

dollarization in the CCA was developed by the volatility of inflation, the depreciation of the domestic currency, the asymmetry among exchange rate policies and the low in financial depth.

Depreciation of domestic currency

The depreciation of domestic currency is a fall in the value of a currency in terms of its exchange rate versus other currencies. Currency depreciation can occur due to factors such as economic fundamentals, interest rate differentials, political instability, or risk aversion among investors. Domestic currency depreciation increases the likelihood of currency substitution, as more people convert to use foreign currency for savings. Bahmani-Oskooee and Techaratanachai (2001) analyzed the Thai case in period 1977-1990 and concluded that: Thai baht depreciation resulted in currency substitution. Sharma et al. (2005) conducted a study on the functions of the USD in substituting the domestic currencies of six different countries in the period 1977 - 1996. The main finding is: domestic currency and the U.S. dollar are Morishima substitutes in every country, and the demand for the U.S. dollar relative to the domestic currency appears to respond more to a change in the opportunity cost of holding domestic money (exchange rate depreciation) than the opportunity cost of holding the U.S. dollar (the domestic interest rate).

Real GDP

The study of Kasawneh et al. (2010) examined the determinants of dollarization in Jordan with actual inflation rate, real GDP, expected depreciation rate and money supply. The results shown that the depreciation got the highest influence on the unofficial dollarization, while real GDP increase stood at the second rank, and then inflation rate.

Bank capital in foreign currency

As per Hake et al. (2014)' study, the amount of bank capital in foreign currency were one

of two main factors causing the credit dollarization problem in these regions.

Interest rate differentials

In the working paper of Basso et al (2007), several different predictions and conclusions among financial determinants and dollarization were discussed. The difference in interest rates could affect the currency component between deposits and loans.

Exchange rate fluctuation

Neandis and Savva (2009) summarised determinants of dollarization, includes money base, exchange rate and interest rate differential, and the international financial integration. Of which, exchange rate fluctuation had strong impacts on dollarization.

Sovereign risk

Mwase and Kumah (2015) found out that the higher sovereign risk and business activity a country had, the greater level of dollarization that country faced with. In addition, an increase in the exchange rate and a decrease in relative prices had reduced dollarization.

Foreign income of businesses

Raheem and Asongu (2016) argued that the ease of access to foreign income of business enterprises could affect the degree of dollarization. Three sources of foreign income could be consisted of financial integration, commercial openness and the leasing of natural resources. The positive and significant determining factors of dollarization in the SSA were financial integration and commercial openness. On the contrary, natural resource leasing showed an unrelated relationship with financial dollarization.

To clarify the relationship between financial development and dollarization, Bannister et al. (2018) conducted research based on the sample of 77 countries, with the data collected from 1996 to 2015. The test consequences illustrated that while the credit dollarization put negligible impacts

on the financial deepening, the dollarization of deposits seriously and negatively influenced the economy. An explanation for this result can be found in the article of De Nicolo et al. (2005). In contrast to the financial deepening, the test results described that there was no relationship between dollarization and financial access.

Pros and cons of dollarization to the economy

Dollarization is usually considered negative to the economy, but it also has some positive aspects.

Negative impacts of dollarization

Firstly, in dollarized countries, the demand for local currency is not stable. In case of volatility, people suddenly switch to foreign currency, which can cause a devaluation of local currency and start the inflation cycle. When people hold a large amount of deposits in foreign currency, a change in domestic or foreign interest rates can cause a large shift from one currency to another (exchange rate speculation). These changes will make it hard for the central bank to determine the domestic money supply and can cause instability in the banking system (Kubo, 2017).

Secondly, dollarization makes the local currency become more sensitive to external changes, so that efforts of monetary policy to influence aggregate demand for the economy through adjusting lending rates become ineffective (Duma, 2014).

Thirdly, it affects the planning and implementation of the exchange rate policy. It can cause instability in the domestic demand for money, as people tend to shift from the local currency to the US dollar, which causes a sharp increase in the demand for the US dollar and puts pressures on the exchange rate (Watanabe, 2006).

Fourthly, official dollarization disrupts the central bank's function as a lender of last resort. In developing countries that are not fully dollarized, even though banks have low equity capital, their customers still believe in the safety of bank deposits. The

reason is that there is an implicit guarantee from the government for these deposits. This guarantee is only possible for local currency, not for US dollars. On the contrary, for fully dollarized countries, the banking sector will experience fluctuations in the event of a commercial bank's failure and will have to stop working when the ultimate lending function of the central bank is no more available (Berg and Borensztein, 2000).

Finally, when a country is dollarized, the domestic economy and the financial system depend heavily on the dollar. The stability of the financial system is tied to the dollar. This leads to an external economic crisis that could seriously affect the financial systems of countries using two currencies. Dollarization makes it difficult for those countries to successfully respond to external uncertainties and volatilities (because their monetary policies are no more effective). Therefore, those dollarized economies are more susceptible to external shocks and even reduced economic growth (Nguyen, Thu Hang and Nguyen, Duc Thanh, 2010).

Positive impacts of dollarization

On the other side, dollarization has some positive impacts.

First, dollarization creates a pressure relief valve on the economy during times of high inflation, imbalance, and unstable macroeconomic conditions. Since there is a large amount of foreign currency in the banking system, it will act as a hedge against inflation and a means of buying goods on the informal market (Csajbok et al., 2010).

Second, in officially dollarized countries, by using foreign currencies, inflation rates are maintained close to low inflation, the security of private assets are increased, savings and long-term loans are also gone up. Furthermore, in these countries, central banks will no longer be able to issue a large amount of money and then cause high inflation, and the state budget will not be able to rely on this source of issuance to cover budget deficits, monetary and budget

discipline have been tightened. Therefore, the budgeting programs will be more positive (Balino et al., 1999).

Third, dollarization can help to promote foreign trade and investments. Countries that implement official dollarization can eliminate balance-of-payments risks and controls for foreign currency purchases as well as encourage free trade and international investments. Besides, they can also lower interest spreads on external debt, lower budget spending and spur investments and economic growth (Berg and Borensztein, 2000).

Fourth, the exchange rate is considered to be easier to predict in official-dollarized countries. For countries that apply the floating exchange rate regime, the uncertainties in international trade and investments that arise due to the exchange rate between domestic and currency outside the region may be reduced, then the exchange rate risk may also be decreased (people do not need to concern about the devaluing or appreciating of the domestic currency). Thus, it leads to the promotion in

international trade and economic growth (Goujon, 2006).

RESEARCH METHODS

Data collection

The data used in this research is monthly data, which collected from the International Monetary Fund (IMF), the World Bank Open Data, the General Statistic Office of Vietnam and the website of State Bank of Vietnam for the period of 2010-2019.

Research model

The regression model in this study is log-linear regression model. I choose log-linear regression model to run for this model, with the use of $\ln FCD/M2$ as the dependent variable. The use of log-linear transformation is to decrease the data's variability (Wang et al., 2014). The independent variables: inflation (INF), USD deposit interest rates (USDIR), exchange rate (FX), consumer price index (CPI), foreign direct investment capital (FDI) and import (IM). The equation is built as below:

$$\ln FCD/M2_t = \alpha_0 + \beta_1 INF + \beta_2 FX + \beta_3 USDIR + \beta_4 IM + \beta_5 FDI + \beta_6 CPI$$

Of which, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are estimated coefficients.

Following are the explanations of variables in the model: the first one is the dependent variable, the measurement for dependent variable is foreign currency deposits over broad money (FCD/M2). FCD/M2 is used as an indicator to estimate the level of dollarization in an economy according to the IMF. Besides, there are two control variables and three independent variables. The two control variables include:

- Exchange rate (FX): the rapid exchange rate adjustment because of high potential pass through of the exchange rate to the inflation, it raise the concerns about the soundness of financial system in the view of high degree of dollarization (IMF, 2003). Bahmani-Oskooee and Techaratanachai (2001) found that the depreciation in exchange rate could cause currency substitution as

it raised the domestic value of foreign assets.

- USD deposit rate in local country (USDIR): the decrease in USD interest rates in local country can lead to the reduction of US deposits, so that it makes the lending to society by USD reduce, while transfer US to the abroad increase (Thuy Tran, 2016).

Three independent variables are:

- Inflation (INF): in the countries with high inflation, the dollar market become more massive (Castillo, 2010). Calvo (1996) also stated that in high inflation countries, they will start using, exchanging and storing the US Dollar as a main value.
- Foreign direct investment (FDI): The growth in foreign direct investment

(FDI) will lead to the increase in both tradable and non-tradable goods. When the demand exceeds, the relative price of non-tradable goods will be higher. It will appreciate the domestic currency and the exchange rate, which reduce the dollarisation process (Menon, 2009). However, Duma (2009) carried out the research about the dollarisation in Cambodia showed that the FDI capital flow had contributed to the large amount of dollar, enlarge the dollar supply and cause the dollarisation in Cambodia

- Imports (IM) (unit: billions of U.S dollar): When the import is higher than the export, the trade balance will be negative, which lower the country

exchange rate (Kramer, 2020). The depreciation in the exchange rate would lead to higher inflation, so that cause the higher FCD to M2 ratio and faster dollarisation process (Samreth et al., 2019).

- Consumer price index (CPI): Ghalayini (2011) in his research about the dollarization in Lebanon showed that the change in dollarization drive the change in CPI. When the CPI increase, it implies that the signal for the high inflation begins, which may weaken the strength of the domestic currency and strengthen the power of US dollar.

The hypotheses and sources for developing hypotheses are presented in the table below:

Table 1. Summary of variables and hypotheses in the research model

Classification	Variables	Expected sign	References
Dependent variable	lnFCD/M2		
Control variables	INF	+	Renzo Rossini, Vega and Perez (2016)
	FX	+	Nkunde Mwase and Kumah (2015)
Independent variables	USDIR	+	Thuy Tran (2016)
	IM	-	Andreas Hauskrecht and Nguyen Thanh Hai (2004)
	FDI	+/-	Tal Nay Im and Michel Dabadie (2007); Duma (2009)
	CPI	-	Fabric and Vujanovic (2017)

Source: Authors' compilation from literature review

Based on the variables selected, the null hypotheses for this research are developed as followed:

- H1: There is a positive and significant impact of the inflation rate on the dollarization in the Vietnam's economy.
- H2: There is a positive and significant impact of the exchange rate on the dollarization in the Vietnam's economy.
- H3: There is a positive and significant impact of the USD deposit interest rate on the dollarization in the Vietnam's economy.
- H4: There is a negative and significant impact of the total imports value on the dollarization in the Vietnam's economy.
- H5: There is a positive or negative impact of the foreign direct investments on the dollarization in the Vietnam's economy.
- H6: There is a negative and significant impact of the consumer price index on the dollarization in the Vietnam's economy.

EMPIRICAL RESULT

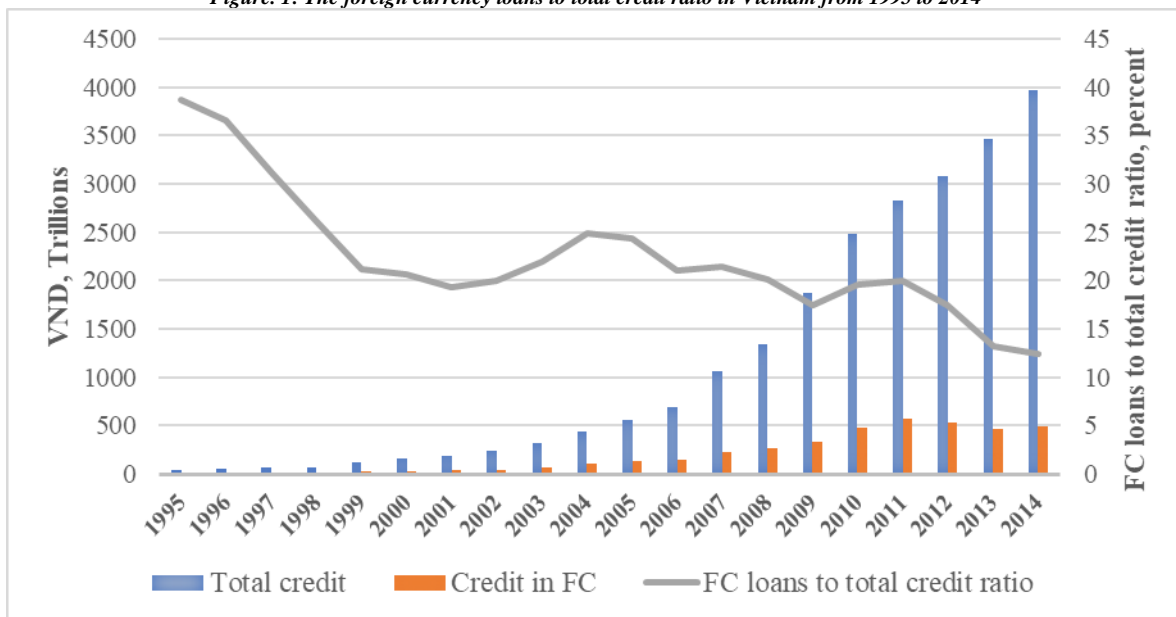
Overview of dollarization in Vietnam

Vietnam has had a long history of using US dollar as a currency substitution. In the circumstance that Vietnam is a member of ASEAN, participates in AFTA and APEC, effectively implements the FTA with the United States of America, becomes a member of the World Trade Organization (WTO) and the export market. Vietnam is expanding day by day, the trend of capital from outside the country pouring into Vietnam more and more through both direct and indirect investment channels, such as ODA and other sources ... has created favorable conditions for the dollar to thrive in our country. According to the IMF (International Monetary Fund)'s assessment criteria, a country with the FCD/M2 ratio greater than 30% is considered as a country with a high degree of dollarization. Preliminary statistics show that the dollarization rate in the Vietnamese economy has always been above 20%, which is much higher than in other regional

countries such as Thailand, Indonesia and Malaysia (at around 7-10%) (Huynh, 2020). Particularly, in the period of 1992-1996, this rate was always above 30% and the FCD/M2 ratio accounted for up to 40% in 1992. This was extremely an alarming number in the case that Vietnam's economy had just stepped out of a period of stagnation, subsidies and gradually shifted to a socialist-oriented market mechanism. In the latter period, with the efforts of

Vietnamese government and the SBV, the dollarization rate experienced a declining trend to 31.5% in 2001, 21% in 2003 and reached 11% in 2014 (Pham, T.H.A, 2017). Also, in the research of Pham, T.H.A (2017), the credit dollarization in Vietnam exhibited a reduction from the highest point of over 38% in 1994, then sharply went down to 19% in 2001. The trend continued to decrease to 10% in 2016 after a moderate increase in the period of 2002-2005.

Figure. 1: The foreign currency loans to total credit ratio in Vietnam from 1995 to 2014



Source: Pham, T.H.A (2017)

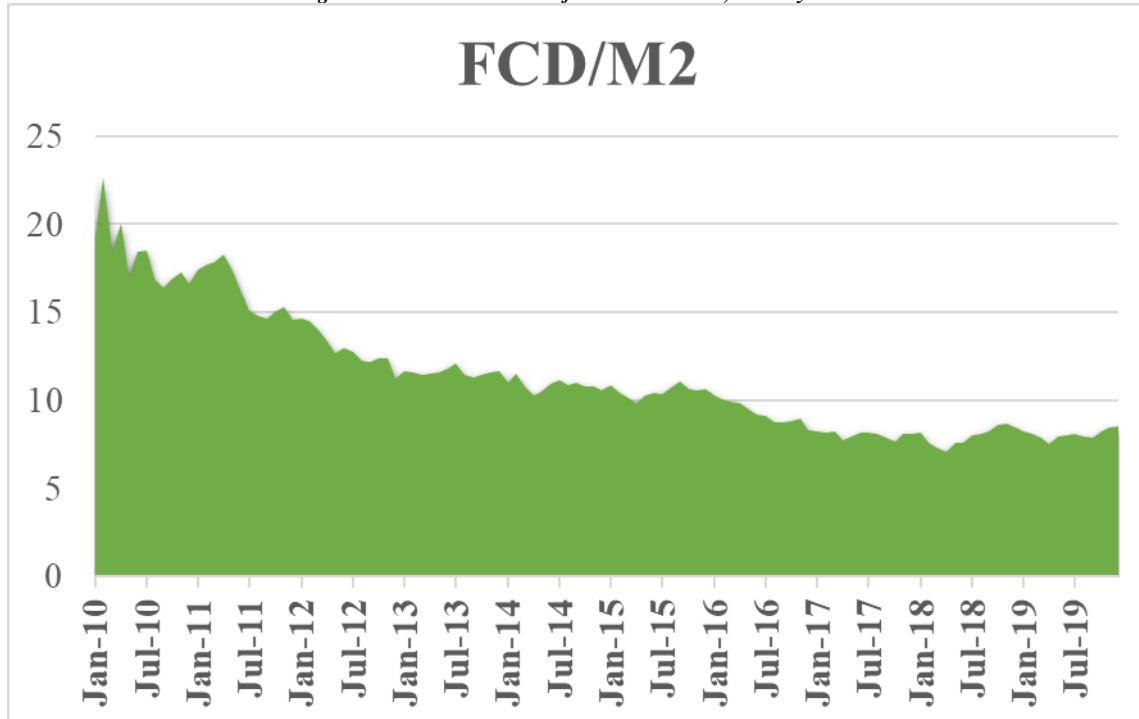
The causes of Vietnam's dollarization were illustrated in several papers: Nguyen, T.H (2011); Pham (2017); Do (2010) and Dao, D.T (2015). The high inflation and the Vietnamese Dong (VND)'s depreciation were expressed as the main reasons for the development of currency substitution. Due to Jongwanich and Park (2009), Vietnam experienced a long period of hyper-inflation during 1980s-1990s, which was listed as one of the highest inflation rates among Asian countries. That is the reason why the FCD/M2 rate in Vietnam during this period was above 40%. In addition, the upward movements of dollarization were due to the increase in international payment demand and the impacts of international capital flows. Since the opening of the economy, the export and import turnovers and foreign

investment flows into Vietnam have been rising, so businesses need to hold a large amount of foreign currency to serve the needs of international trade and investment expansion (Nguyen, T.H., 2011). Moreover, remittances increased with regulations allowing individuals to keep foreign currency in the form of savings deposits and foreign currency accounts at the banking system and to be stored as cash foreign currency (Le T.M.H, 2009). Further, the black foreign exchange market still exists beyond the control of the government: The foreign currency exchange, advertising, price listings, goods and services in foreign currency still happened in Vietnam, even the Government has taken many measures to limit these problems. There were times when the black market plays a dominant

role in the source and prices of foreign currency., When the banks did not provide enough dollars, or had restrictions on buying foreign currencies, businesses and

people with their needs of U.S dollar met through the black markets (Nguyen, T.H., 2011 and Pham, T.H.A., 2017).

Figure .2: The FCD/M2 ratio from 2010 to 2019, monthly data.



Source: IMF (2020)

Figure 2 above represents the trend of dollarization in the period of 2010-2019. It is clear that the trend gradually moved downward over the period. Thanks to several drastic interventions which were regulated by the government of Vietnam and the SBV, the dollarization rate in Vietnam have reduced significantly. At the end of 2019, the FCD/M2 ratio declined to

only about 8%, which shown an appreciated sign in the de-dollarizing process.

Descriptive statistics of variables in the research model

The data set includes 120 observations which were collected from the January of 2010 to the December of 2019. Below is the table summarizing for all variables:

Table 2: Statistical description data of the variables in the model.

Variables	Mean	Standard deviation	Min	Max
lnFCD/M2	12.09744	8.761111	7.102833	100
INF	6.09625	5.350835	0	23.02
FDI	1.08e+10	7.79e+09	3.73e+07	3.43e+10
USD deposit rate	0.4329167	0.5220956	0	2
Exchange rate	21636.12	1227.439	18479	23425
Import	1.34e+10	4.90e+09	1.38e+09	2.32e+10
CPI	139.8975	18.62225	95.94603	168.8317

Source: Authors' compilation from secondary data using Stata software

The mean for the lnFCDM2 is about 12.1, which implied that one domestic currency in M2 supply is equivalent to 12.1 US dollar deposit in Vietnamese commercial banks. One country is considered as the

dollarization situation when the foreign currency deposit by M2 money supply ratio is higher than 30% (Hung Tran, 2014). The ratio is still lower than 30%, and its trend is moving downward since 2010 (figure 4.1.2),

with the decrease of USD deposit. In 2010, USD deposit was below 20%, in 2014 was 11.4% (Dao, D.T., 2015), the standard deviation of lnFCDM2 is 8.76. The average point of CPI is nearly 140 point, the highest value is 168.83 point and the lowest CPI point is 95.95. The average value of inflation is 6.1% while the highest inflation percentage (CPI ratio) was 23% and the lowest CPI ratio was zero.

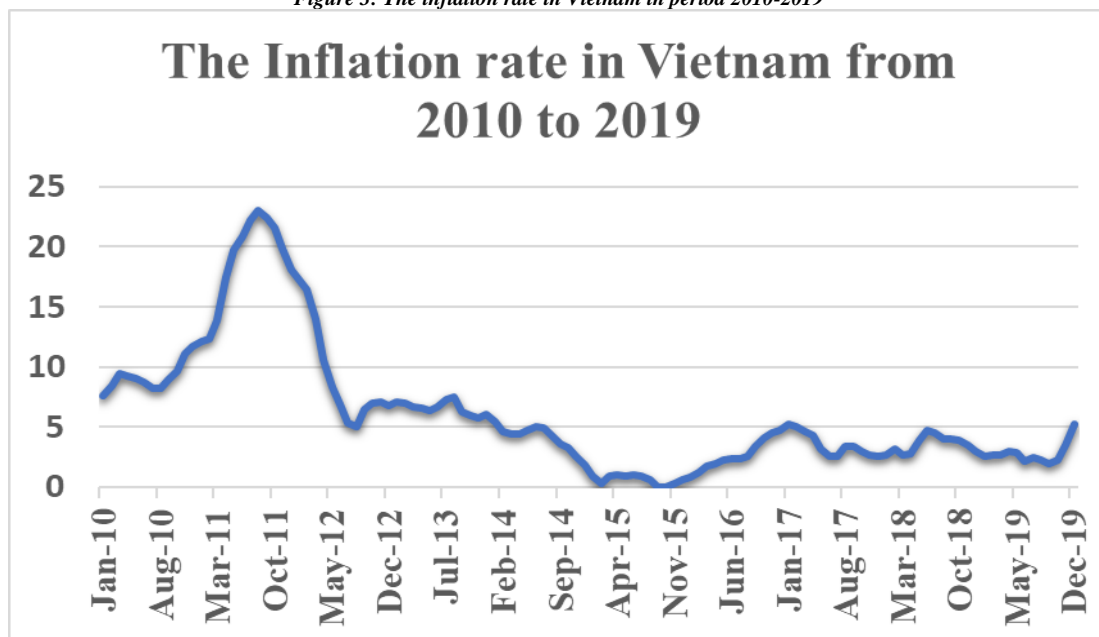
The reason may come from the high inflation rate in 2011- about 18.13%, which was the highest ratio since 2008, and also the highest among ASEAN countries (General Statistic Office of Vietnam, 2011). The FDI- which is the foreign direct investment inflows from abroad countries (Duce, 2003) has the average value of \$12 billion per month, which shows that Vietnam is an attractive destination for foreign investors. The deposit interest rates for USD is just about 0.43%, when the interest rates for domestic currency is higher than the USD rates, it means that the domestic currency is more attractive, as well as U.S dollar is discouraged by the monetary authorities in order to avoid dollarization (Anurag, 2012).

The average exchange rate between USD and VND is 21,636VND for 1 USD, the highest exchange rate is 23,435VND for 1

USD, and the lowest is 18,479VND for 1 USD, along with the standard deviation is 1227.4. The average value of import is \$13 billion per month, the lowest value recorded is \$1.4 billion, the highest is 2.32e+10 and the standard deviation is 4.90e+09.

Three approaches contributed to this process. First of all is the changes in inflation rates over the period. As we can see in figure 3, the inflation rate is unstable during the period with abnormal increases and decreases. In 2011, the inflation rate went up rapidly to around 23% and then immediately went down in the next year. Since 2012, the inflation tended to stabilize below 7% (except for a sharp decline to below 1% in 2015). The SBV issued the Resolution 11/NQ-CP affirming that controlling inflation and stabilizing the macro-economy were the top priority targets of the SBV. In addition, the decrease in inflationary pressure from the demand side as well as the supply side remarkably helped to stabilize inflation (SBV.gov.vn, 2015). To summarize, in the period 2010-2019, the synchronous application of monetary and fiscal policies, along with the promotion of production development and export growth, inflation was maintained at a single-digit level with downward trend.

Figure 3: The inflation rate in Vietnam in period 2010-2019

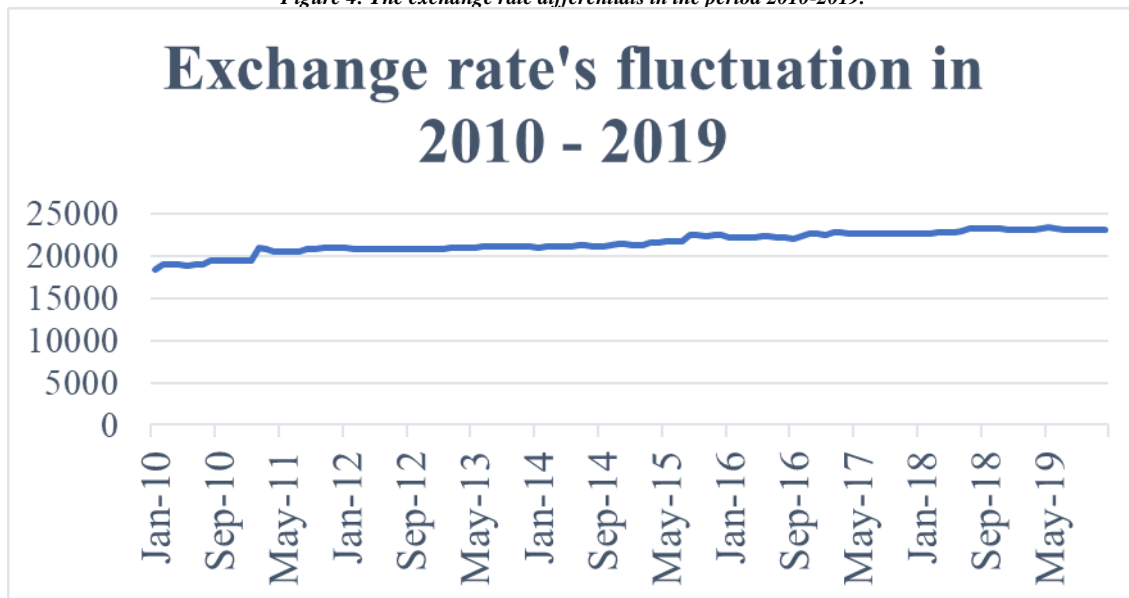


Source: GSO (2020)

The second contribution to de-dollarizing process is the exchange rate differentials. During the period, the SBV applied several synchronous solutions so as to control and stabilize the market. Therefore, the USD/VND exchange rate was more stable, the monetary policies issued by the SBV created positive changes in the foreign currency market, and the free market almost stopped working. Looking at chart 4, we can see that the exchange rates were less volatile, and the average increase over the years was about 3%. It was due to the change in 2015 when the SBV expanded the

exchange rate band to +/- 3%. Besides that, on December 31th, 2015, the SBV issued Decision No. 2730 / QD-NHNN on the announcement of the central rate of USD/VND and cross-rate of VND with some other foreign currencies. Moreover, the difference between the interbank exchange rates and the listed rate of commercial banks was narrowed (with the difference from 100 to 300 VND/USD), thereby gradually reduced the psychology of hoarding foreign currency of organizations and individuals (Nguyen, T.C, 2020).

Figure 4: The exchange rate differentials in the period 2010-2019.



Source: IMF (2020)

The exchange rate has been quite stable over the 2010-2019 period. SBV's exchange rate management mechanism is in line with current Vietnam's conditions, enhancing its

flexibility and being more proactive with the market fluctuations.

Finally, the interest rate differentials were likely to be the strongest contribution in the process of de-dollarizing.

Table 3: The VND deposit rate and USD deposit rate in the period 2010-2019.

Year	VND deposit rate (%/year)	USD deposit rate (%/year)
2009	7.9	3.5-4
2010	11.2	4.5-5
2011	14	2
2012	10.5	2
2013	7.1	1.25
2014	5.76	0.75
2015	4.75	0
2016	5	0
2017	4.8	0
2018	4.74	0
2019	4.97	0

Source: The SBV's website.

The above data illustrates the deposit interest rate both in USD and VND over the period. There are large differentials in deposit interest rate between the VND and the USD. It means that the VND brings higher return in comparison with the USD.

These differentials indicate the monetary tools of the SBV in reducing the attractiveness of the U.S dollar and creating higher benefits for the VND. Specially, in 2015, the SBV issued Decision 1938/2015/QĐ-NHNN on ceiling the USD deposit interest rate to 0% for both individuals and enterprises. The State Bank's persistence with the policy of 0% USD ceiling interest rate contributes to reduce the situation of hoarding USD, people and businesses will switch to hold more VND. At the same time, the unattractive USD deposit interest rate will also create better conditions for more VND deposits to flow into commercial banks, therefore facilitating the reduction in VND deposit rates and lending rates. The maintaining of the USD deposit interest rate of 0% contributes a lot to anti-dollarization in the economy, which avoids people and businesses from holding USD, and leads them to sell out, thereby increasing the supply of USD in the financial market and help to stabilize the exchange rate (SBV.gov.vn, 2017).

Policies implemented by Vietnam for de-dollarization.

On December 13, 2005, the Foreign Exchange Ordinance was passed by the Standing Committee of the National Assembly and was effective on June 1, 2006. In which, there are provisions to minimize the use of foreign currencies in the territory of Vietnam. The Foreign Exchange Ordinance has defined the principles: strictly prohibiting individuals' foreign currency transactions, listing, advertising in the territory of Vietnam, enhancing the position and the convertibility of the VND in order to limit and proceed to completely eliminate the dollarization phenomenon, preventing the widespread use

of foreign currencies in the Vietnamese territory, and imposing specific regulations on the opening and using of banking accounts, using foreign currency cash, payment cards and other currencies in the border area.

With the flows of foreign indirect investments: all investments are performed in VND to ensure the position of the local currency as well as to fulfill the goal of using only Vietnam Dong in the territory of Vietnam. Legal credit institutions can monitor and control all of Vietnam's indirect investments, along with forecasting the convertibility of those capitals into foreign currencies to transfer abroad.

On July 4, 2007, the Prime Minister signed Decision No. 98/2007/QĐ-TTg, approving the project "Improving the convertibility of the Vietnam Dong and overcoming the dollarization in the economy". The goals of the project are: by 2010, the convertibility of VND will be improved and the dollarization will be reduced in the economy. Thereby, enhancing the linkage between the domestic economy and the world economy, supporting, and promoting external economic developments, attracting foreign investment capital, enhancing the position of Vietnam Dong and improving the efficiency of monetary policy and exchange rate management.

The upward movements in the exchange rate have forced the SBV to take drastic interventions to stabilize the exchange rate. Especially, the sudden increase in the exchange rate from May to June 2008, July to September 2009, the period from October 2010 and the beginning of 2011 brought about macroeconomic instabilities and the tension of the foreign exchange market. To stabilize the forex market as well as reduce the imbalance between supply and demand of the USD, the SBV had to continuously adjust the average interbank exchange rate in combination with many drastic administrative measures to limit the buying and selling foreign currency activities, both on the interbank market and on the free market.

Accordingly, from May 2, 2012, when Circular No. 03/2012/TT-NHNN officially took effect, foreign currency credit will be seriously controlled to ensure the consistent growth between foreign currency credit and the ability to mobilize. This is a measure to implement the Government's consistent policy towards limiting dollarization in the economy.

With complicated changes in exchange rates and the foreign currency credit growth, which "surpassed" the domestic currency credit, the SBV has taken drastic actions to deal with the situation of foreign currency credit growth and dollarization. These efforts have not only balanced the stability in the exchange rate and the foreign exchange market since June 2011 but also reduced foreign currency credit growth. Since March 2012, the SBV issued Circular No. 03/2012/TT-NHNN (March 8, 2012) regulating foreign currency loans of credit institutions and foreign bank branches. These actions are considered as strategic steps of the SBV in restricting banks from hoarding foreign currencies, limiting manipulation, strengthening centralized management on the SBV, and thereby reducing foreign exchange risks. On October 2, 2015, the SBV issued Circular 15/2015/TT-NHNN on guiding foreign currency trading in the domestic foreign currency market among credit institutions.

These institutions are permitted to conduct foreign exchange transactions with each other and with customers. Commercial banks are encouraged to use term derivative instruments in transactions with customers. On December 17, 2015, the State Bank issued Decision 2589/QD-NHNN on the maximum interest rate for USD deposits of organizations and individuals at credit institutions and foreign bank branches, replacing Decision 1938/QD-NHNN dated September 25, 2015. Accordingly, the interest rate applied to deposits of organizations (except credit institutions, foreign bank branches) as well as individuals is 0% / year.

In Circular 42/2018/TT-NHNN on amending and supplementing a number of articles of Circular No.24/2015/TT-NHNN on foreign currency lending by credit institutions, foreign bank branches for residential borrowers. As of October 1st, 2019, commercial banks are no longer allowed to provide medium and long-term foreign currency loans to pay abroad for imported goods and services, even when the borrowers have enough foreign currency from productions and business revenues to repay the loans.

Analysis of correlation among variables in the research model

Table 4: Correlation matrix result

	lnFCD/M2	CPI	INF	FDI	USDIR	IM	FX
lnFCD/M2	1.0000						
CPI	-0.9630	1.0000					
INF	0.6924	-0.6364	1.0000				
FDI	-0.3600	0.3468	-0.2305	1.0000			
USDIR	0.3182	-0.2431	0.1137	-0.2736	1.0000		
IM	-0.9273	0.8645	-0.5507	0.4281	-0.4496	1.0000	
FX	-0.9273	0.9504	-0.5565	0.3781	-0.4401	0.8737	1.0000

Source: Authors' compilation from secondary data using Stata software

The result shows that lnFCD/M2 is strongly negatively correlated with all independent variables, in the exception of FDI and USDIR. Besides that, we can also see that the correlation between most independent variables is less than 0.5, except some cases, for example, $r(\text{IM}, \text{CPI})$, $r(\text{IM}, \text{FX})$, etc.

Diagnostic Test

Before coming to run the regression model, I will test to check whether any errors in this model. Firstly, with the test for multicollinearity, we use the command VIF.

Table 5: VIF test result

Variables	VIF
CPI	23.60
FX	20.97
IM	5.44
USDIR	2.42
INF	1.78
FDI	1.24

Source: Authors' compilation from secondary data using Stata software

CPI and FX have a high VIF value, equals 23.6 and 20.97, respectively, with the highest values compared to other variables Bhandari (2020). It means that they can be predicted by other independent variables in the dataset (Bhandari, 2020).

Secondly is the OVTEST to check whether this model has omitted variable or not.

Ramsey RESET test using powers of the fitted values of IFCDM2
 Ho: this model has no omitted variable
 F(3, 110) = 11.56
 Prob > F = 10.2

The Prob > F = 0.0000 which is lower than the P-value of 5%, the null hypothesis is accepted. The P-value for our F_statistic equals 10.2 which is higher than $\alpha=5\%$, so we cannot reject the null hypothesis of no

omitted variables. Therefore, it indicates that the functional form does not include the existence of omitted variable.

Finally, is the HETTEST for checking heteroscedasticity.

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
 Ho: this model has no heteroscedasticity
 Chi(1)= 1.60
 Prob > chi2 = 0.2065

We see that the p-value equals 0.2065 which is higher than $\alpha=5\%$, then the null hypothesis of homoscedasticity cannot be rejected, it indicates that the functional model does not have heteroscedasticity.

Regression result

The regression result is shown below:

Table 6: Log- linear regression model result

Source	SS	df	MS	Number of obs	=	120
Model	8.9736156	6	1.4956026	F(6, 113)	=	340.08
Residual	.496948655	113	.004397776	Prob > F	=	0.0000
				R-squared	=	0.9475
				Adj R-squared	=	0.9447
Total	9.47056425	119	.079584574	Root MSE	=	.06632

1FCDM2	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
INF	.0072496	.0015157	4.78	0.000	.0042467 .0102524
CPI	-.0123902	.001586	-7.81	0.000	-.0155324 -.009248
USDdepositrates	.0447816	.0181247	2.47	0.015	.0088733 .0806899
Exchangerate	5.23e-06	.0000227	0.23	0.018	-.0000397 .0000502
ImportUSD	-3.89e-12	2.89e-12	-1.35	0.181	-9.62e-12 1.83e-12
FDI	-5.84e-14	8.69e-13	-0.07	0.947	-1.78e-12 1.66e-12
_cons	3.998879	.3075266	13.00	0.000	3.389613 4.608145

*p < 10%, **p < 5%, ***p < 1%

Source: Authors' compilation from secondary data using Stata software

From the regression result above, the research model result is as followed:

$$\ln FCD/M2_t = 0.0071INF + (5.23e^{-06})FX + 0.044USDIR + 0.012CPI + (3.89e^{-12})IM - (5.84e^{-14})FDI$$

Therefore, the actual results are compared with hypotheses on the determinants of dollarization in Vietnam are summarized in the following table.

Table 7: Research hypotheses and actual results

Hypothesis	Coefficient	P-value	Actual Result
H1: There is a positive and significant impact of the inflation rate on dollarization in the Vietnam's economy.	.0072	0.000	Support
H2: There is a positive and significant impact of the exchange rate on dollarization in the Vietnam's economy.	5.23e-06	0.018	Support
H3: There is a positive and significant impact of the USD deposit interest rate on dollarization in the Vietnam's economy.	.0447	0.015	Support
H4: There is a negative and significant impact of the total imports value on dollarization in the Vietnam's economy.	-3.89e-12	0.181	Not support
H5: There is a positive or negative impact of the foreign direct investments on the dollarization in the Vietnam's economy.	-5.84e-14	0.947	Not support
H6: There is a negative and significant impact of the consumer price index on dollarization in the Vietnam's economy.	-.0123	0.000	Support

Source: Authors' compilation from secondary data using Stata software

DISCUSSION

Overall, the Prob>F = 0.0000 which is lower than the P-value of 5%, so that this model is reliable for the analysis. The overall R-squared is 0.9475, which implies that all the independent variables can explain about 94.75% for the dependent variable in this model. There are four significant variables among six independent and control variables, they are: INF, CPI, FX and USDIR. These indicators are all significant at 5% independence level. Following are the discussions of each determinant.

First of all, inflation has a positive impact on dollarization. The coefficient of INF is 0.0072, which implies that when the inflation rate increases one unit, the FCD/M2 ratio will increase 0.72%, showing the positive impact of these two variables.

This result is in line with my expectation and it is consistent with the findings of Oskooee and Domac (2003) - who carried out the research on the relationship between dollarization and the inflation in Turkey and summarized that the high inflation in Turkey, combined with the macroeconomic stability had led Turkey become one of the most dollarized countries. High inflation is one of the main drivers for the dollarization (Aarle and Budina, 1996). Though, dollarization is considered as a tool to combat against the high inflation and high volatility of exchange rate (Court, 2012). De Haas et al., (2013) found out that high inflation would lead to more foreign currency deposit loans, supporting the money theory of financial dollarization (Levy and Size, 2003). The theory argued that the foreign currency composition of liabilities and assets is determined by the volatility of the inflation and the exchange rate. In the period from 1980s to early 1990s, Vietnam economy had suffered the high inflation than most Asian economies, which reached the rates of 67% and 68% in 1990 and 1991 respectively, the FCD to M2 ratio also increased to the peak of 41.5% in 1991 (Jongwanick and Park, 2009).

Secondly, the consumer price index has negative impact on dollarization. The coefficient of CPI is -0.0124, which shows the negative impact of the CPI on the FCD/M2, when the CPI increases 1 unit, the FCD/M2 ratio will decrease 1.24 %, implying that the higher CPI, the lower dollarization. This result is opposite to my expectation and the result of Fabric and Vujanovic (2017) who argued that the CPI and FCD/M2, and the dollarization process are direct relationship. However, this result is in line with the research of Park and Son (2008) who indicated that the CPI had negative impacts on the dollarization

process. In the study of Ghalayini (2011) about the dollarization in Lebanon, he showed that the change in dollarization drove the change in CPI.

Thirdly, USD deposit interest rate has positive impact on dollarization. The USD deposit interest rates (USDIR) has the coefficient of 0.045. When the interest on US dollar deposits increases 1%, the FCD/M2 will increase 4.5%, which boosts the dollarization process rapidly. This result is similar with my expectation and the research of Dao, D.T (2015) and Thuy Tran (2016), who did the research on the dollarization in Vietnam. In 2000s, when the interest on US dollar deposits was around 4%, the amount of USD deposits in Vietnamese commercial bank system raised up to 31.7%, which led to the situation of “deposit dollarization” and “loan dollarization”. These terms are described as the foreign currency deposit and foreign currency loan accounts for a great proportion in the balance sheet of the banking system (Odajiba, 2017). The trend of deposit dollarization in Vietnam has been moving down below 20% since 2010 when the USD deposit interest rate was set below 1% (Dao, D.T, 2015). Besides, Pham, T.H.A (2017) investigated that the decrease in the spread between the VND and USD interest rates showed that the US dollar was more attractive than the VND, the depositors would prefer US dollar than VND though the interest rates in VND was still higher. The reality showed that the decrease of 12% in the spread in 1994 caused the higher proportion of US dollar deposit, from 20% in 1994 to 31.7% in 2001.

Finally, exchange rate has positive impact on dollarization. The exchange rate variable has the coefficient is $5.23e-06$, showing the direct impact on the FCD/M2. If the exchange rate increases one unit, the FCD/M2 will increase $5.23e-04$ percent, displaying the depreciation in the exchange rate of USD/VND, the appreciation in US dollar and depreciation in VND will weaken the strength of VND and then causes higher

dollarization. This result is the same with my expectation and the result of Misu et al., (2020), who agreed that the appreciation in US dollar boost the FCD/M2 ratio and make the dollarization to be more serious. The higher rate in FCD/M2 can contribute to the volatility of exchange rate (Honohan, 2007). Mecagni et al., (2015) stated that the depreciation in nominal exchange rate was one of the main drivers for the dollarization. In Vietnam, the FCD to M2 ratio reached the peak at 41.7% in 1991, then gradually decreased to 20.3% in 1996 before strongly increased to 31.7% in 2001 during the crisis in Thailand. The higher of FCD to M2 ratio is described as the association with the large depreciation of VND and the higher in US Dollar interest rates (Hauskretsch and Nguyen, 2004). In contrast, the appreciation in the domestic currency will help lower the dollarisation process (Garcia- Escribano and Sosa, 2010). However, as exchange rates are quite stable in this period, the impacts of exchange rate on dollarization in Vietnam is insignificant.

Recommendations

Vietnam has gained significant results in reducing dollarization and its negative impacts over years. However, to remain this achievement, stakeholders should pay attention to the following recommendations: *Recommendations to the State Bank of Vietnam*: (i) Encourage financial institutions to develop new deposit and investment products reduce the "attractiveness" of holding and trading foreign currencies, along with improving greater economic benefits for the VND. Monetary and exchange rate management policies should ensure the value of the local currency and limit the use of foreign currency; (ii) Impose limitations of the number of foreign currency loans, particularly for both borrowers and credit limit; (iii) Carry out the assessments on the implementation of legal provisions on foreign exchange management in Vietnam, from which there should be adjustments and supplements to suit the goal of limiting the dollarization in

the economy; (iv) Along with supervising and strictly handling the implementation of foreign exchange management regulations, monetary authorities also need to ensure that financial transactions are done in Vietnam Dong, commercial banks and financial institutions should increase higher fee for exchanging money so as to prevent people from holding foreign currency, and then they will gradually switch to hold VND; (v) Shifting the demand for foreign currency credit to buying - selling relationship in order to completely remove foreign currency credit in the future.

Recommendations to the Government: (i) Restrict the use of the government's foreign exchange reserves for spending needs of the government budget; (ii) Strictly prevent and handle all activities of trading and exchanging illegal foreign currency, as well as listing commodity prices and services in USD; (iii) Have a harmony and close cooperation among related ministries and government agencies and the State Bank of Vietnam. For instance: Ministry of Finance, Ministry of Planning and Investment, Ministry of Industry and Trade in supervising the implementation of regulations on foreign exchange management nationwide and from all economic sectors. Moreover, ensuring that there will be strict handling of violations. (iv) Have a heavy sanction for cases of violating the law on foreign exchange management.

CONCLUSION

This research aims to analyze the current dollarization trend in Vietnam from 2010 to 2019, along with pointing out de-dollarization policies that are issued by the government and the State Bank of Vietnam to evaluate how those policies contributed to the process of de-dollarizing Vietnam's economy. A downward movement in the ratio of FCD/M2 indicated that Vietnam have successfully reduced the dollarization rate in the economy over the period. This existing success is due to numerous of changes in the amendment and

supplementation of monetary policies as well as non-stop efforts of Vietnam's authorities. In comparison with the high dollarization rate at around 40% in the 1990s, that rate decreased to only 8% at the end of 2019. The empirical research suggested that there are four indicators that significantly affect the dollarization in Vietnam, they are: the inflation rate, the exchange rate, the USD deposit interest rate and the consumer price index. Indeed, only the consumer price index contains a negative relationship with dollarization, while the three other indicators have positive relationships with the phenomenon. Our research limitations include: First: the FCD/M2 ratio does not reflect the full picture of dollarization in Vietnam, as it cannot cover the amount of cash in foreign currency that people use and hold outside the banking system; (ii) It is very difficult to assess the degree of dollarization in the form of cash; (iii) we do not analyse the relative costs/benefits of dollarization and de-dollarization to monetary policy or/and monetary supply and economic growth; and (iv) we do not discuss the de-dollarization implications for Vietnam. Our paper focuses more on determinants of dollarization in Vietnam. These are the research gaps for further studies.

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