

## Constraints' Monetary Policy, A Case of Cambodia

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### Abstract

Monetary policy plays a stabilizing role in promoting economic growth through a number of channels. The monetary policy applies its tools to effectively manage the money supply to sustain price stability, which is the final goal of a central bank. Alternatively, in the context of dollarized economy, it will hinder the reserve bank from achieving this goal. So, this dissertation focuses on determining the causes of dollarization, the constraints of implementing monetary policies for Cambodia's National Bank, and the approaches to promote the greater use of domestic currency. Resultantly, it will assist it in minimizing the predominance of the greenback and reducing the country's exposure to the US dollar. Historically, as the U.N dispatched humanitarian and emergency relief, international nongovernmental organizations, were allowed to return, and remittances from overseas restarted, funds began to trickle into Cambodia's economy in the mid-1980s. The dollar-based urban economy has benefited from a steady inflow of dollars tied to apparel sector exports, tourism revenues, foreign direct investment, and aid. On the other hand, the riel-based rural economy has failed. Furthermore, Cambodia achieved nearly total defector dollarization between 1991 and 1995, and the situation has remained unchanged. The primary constraint to monetary policy would be a central bank's role as a last-resort lender to assist domestic banks in the event of a bank run or a liquidity shortage, inability to finance fiscal budgets with seigniorage, political costs, loss of independence, and the government's ability to issue medium and long term debt in domestic currency. In other words, we have designed some strategies and measures based on successful dedollarized countries, international finance organizations, and research scholars for Cambodia to diminish dollarization in the economy. Those strategies should comprise research bank independence, which is vital for credibility; the government should strengthen the credible fiscal position, achieve a macroeconomic environment, and develop a liquid and sound financial market for domestic currency-dominated assets. In addition to the central bank should perform a critical role in improving intermediate roles serving as imposing higher reserve requirements on foreign currency, establishing a deposit insurance system to boost banking system confidence, improving quotations and payments of goods and services in home currency, and encouraging private businesses to open bank accounts and pay salaries in riel as well. In addition, the National Bank should advance payments system and financial instruments in domestic currency and elaborate interbank and money markets to better manage national currency liquidity. Importantly, related parties should commit to involvement in lessening the dollarization in Cambodia's economy.

## 1. INTRODUCTION

### 1.1. Background of and Rationales for this Study

Developing and transitional economies have understood financial liberalization and economic reforms to integrate with the global economy and have a better operating and stable economic system during the last decades. Capital accounts are liberalized, and capital restrictions are lifted; domestic financial intermediation is also permitted in domestic and foreign currencies. Those developments caused competition between home and overseas monies since citizens can have domestic contracts and transactions in both currencies. Consequently, most developing countries experienced a significant increase in foreign currency shares denominated liabilities and assets in their monetary systems.

The main root of dollarization in Cambodia involved destroying public confidence to retain the riel's value as a national currency. Following the Pol Pot regime, people primarily conducted business transactions in barter and Vietnamese dong for the most part. Ten months after liberation from the darkest period, Khmer Rouge, the National Bank of Cambodia, was re-established in 1980 under the People's Bank of Kampuchea; therefore, the riel again turned into the country as legal currency.

Genuinely, Cambodia's dollarization volume is still high compared to other countries globally, even though Cambodia's economy trended stable, particularly on the FX rate, inflation, and the average Gross Domestic Product (GDP) growth rate since 1998. Cambodia has attained its complete peace that underpinned macroeconomic and political stability. Cambodia's GDP expanded 7.5 % year to year in 2018, accessible from 1994 to 2018, with an average rate of 7.1 % (CECDATA, 2019)<sup>1</sup>.

Cambodia has become partially dollarized, owing to the flood of 1.7 billion US dollars due to UNTAC's support for the election. The foreign banknotes deposited increased from about 44 million US dollars in 1993 to 3,058 million US dollars in 2009 (World Bank, 2011)<sup>2</sup>.

Furthermore, new official poverty lines introduced in 2013 pointed out that the poverty rate fell sharply from 47.8% in 2007 to 22.9% in 2009, 19.8% in 2011, and 18.9% in 2012 (ADB, 2013)<sup>3</sup>.

The fast growth has helped to increase the gross domestic product per capita in USD for

Cambodian people reached \$973, \$1,042, \$1,131, \$1,218, \$1,330 in 2012, 2013, 2014, 2015, 2016, 2017 and 2018 respectively (NBC, 2019a)<sup>4</sup>.

Referring to Duma (2011a)<sup>5</sup> states the economic development of Cambodia in the 2000s was not entirely possible through the significantly rebuilding of the efforts following decades of the country's civil war and the Khmer Rouge authority and at the instant of American dollar inflow through tourism receipt, foreign direct investment, trade sector, and donation.

However, in 2008 Cambodia and other countries faced a universal financial crisis where real GDP growth had dropped from 3.4 percent in 2008 to 0.5 percent in 2009 (Prasidh, 2009)<sup>6</sup>. Similarly, Cambodia's real growth had fallen from 6.7 percent in 2008 to minus (-1.5) percent in 2009 (Economist Intelligence Unit, 2011)<sup>7</sup>. Due to these challenges, it will take more time to downgrade dollarization in Cambodia's economy.

### 2.1. Statement of the Problem

The dollarization trends are considered high in Cambodia's economy, which challenges decisionmakers to design the best policy mix for sustainable growth, closely with dependable poverty reduction.

Dollarization came from the supply-side in the shapes of expected and enormous inflows of foreign money – up to now, deriving from sizable international partners, private transfer, and export earnings. Such a large influx of the dollar from overseas, coupled on the "demand sides" with a shortage of trust in the home currency and political uncertainties, provided the incentive for steady dollarization, which is the exclusive feature of experience in Cambodia's economy. In addition, dollarization can curb the prudent degree of exchange rate flexibility; resultantly, the monetary policy to accomplish any objectives other than price stability (Kraft, 2003)<sup>8</sup>.

The poor typically have to compensate for some goods and services in the US dollar while their revenues are in national currency. Dollarization worsening the distribution problems between the poor and the non-poor by depreciating, and exchange rate instability may be the bundle of the Cambodian government with the national strategic plan of poverty alleviation.

These people face suffering defeat their purchasing power with a higher risk of exchange rate swing (Lay, Kakinaka, and Kotani, 2012)<sup>9</sup>. In other words, Cambodia's dollarization had

benefitted the dollar-based urban economy rather than the riel-based rural economy where the poverty issue is more intense.

Dollarization has widened like one of the remarkable aspects of proliferation during the last two decades. Attributable to the increasing integration of the universal financial system, the upheaval of restrictions on capital movement and the spring-up volume of trade and dispute on dollarization responded with growing interest.

### 3. METHODOLOGY

#### 3.1. Introduction

Dollarization happens when residents of one country widely use the greenback or another foreign currency alongside home currency. It comprises bank deposits and loans, dollar transactions, and dollar tagging of products and services. As a consequence, the national bank will rarely use its monetary policy to affect the economy. It will most likely be unable to intervene as a last resort lender if licensed financial institutions face financial problems or a financial crisis. The exercise of monetary policy has also changed in this context.

This research aims to determine the consequences of dollarization on growth and the constraints of monetary policy tools implemented by NBC.

#### 3.2. Source of data

There are two macroeconomic data sources, the National Bank of Cambodia (2010 to 2019) and the World Bank (WB) data source (1992 to 2015), used in this research. These data sources are selectively collected for Cambodia, consisting of macroeconomic variables such as GDP, total expenditures, market exchange rate, official exchange rate, export and import of goods. All logarithm variables are used to control any bias in equations.

##### 3.2.1. Data collection and sampling

As mentioned above, this research uses the two macro datasets to respond to this thesis's research questions. Firstly, we have used the NBC data from 2010 to 2019 to create graphs and illustrations, and secondly, we use the World Bank data from 1992 to 2015 to generate the equations and some illustrations. The world bank collects this data from Cambodia, and there are 24 years of sampling data, consisting of GDP growth, GNP, Current Account, Total Expenditures, Exchange Rate, Goods Import and Exports, M2, and so on. Furthermore, all datasets have been cleaned well by equipping the natural logarithm to all variables used in this regression.

##### 3.2.2. Descriptive statistics

Table 3.1 determines the descriptive statistics which will be used in regression in this section. This data stresses 24 years from 1992 to 2015 whereas, this time series data is created to describe the dollarized economy in Cambodia.

Table 3.1: Variables and Descriptive Statistic

Variables	Obs	Mean	Std. Dev. *	Min	Max
Years	24	2003.500	7.071	1992	2015
GDP	24	21.615	4.647	0	23.616
M2	24	2.889	1.063	0	4.140
Exchange Rate	24	8.160	0.278	7.144	8.339

Goods Export	24	20.413	4.451	0	22.731
Goods Imports	24	20.753	4.512	0	23.090
Total Employments	24	0.045	0.088	0	0.300
Total Expenditures	24	5.296	5.097	0	12.396
ExportVolume index	24	182.015	189.609	0	650.377

Note: All variables are converted into natural logarithm to approach in this model.

\* Standard Deviation and Min and Max denotes as Minimum and Maximum volume of variables.

Source: Author's calculation from World Bank datasets from 1992-2015

Remarkably, almost logarithms of variables took place from zero to the volumes. These show that Cambodia's growth might have started from zero to its volume while Cambodia has had more wars that smashed all infrastructures and developments. From 1992 to now, Cambodia has increased

while UNTAC has significantly fostered the dollarized economy.

Another interesting one is Cambodia's exports and imports in statistics. It means that Cambodia's economy has more imported goods than exports from 1992 to 2015, whereas monetary tools such as M2 and exchange rate sensitivity do not move fast in the dollarized economy.

The correlation of variables is calculated to see the unit root and the correlations among this model's variables by running the VAR regression model in this model.

Table 3.2: Correlation of variables

Name	GDP	M2	Current Account	Total Employment	Total Expenditure	Exports	Imports	Exchange Rate	Export Index
GDP	1.00								
M2	0.0527	1.00							
Current Account	-0.6878	-0.0496	1.00						
Total Employment	0.0531	0.0703	0.0841	1.00					

Total Expenditures	0.6325	0.1508	-0.6477	0.2010	1.00				
Exports	0.7268	0.1386	-0.8836	0.0709	0.8676	1.00			
Imports	0.7355	0.1323	-0.9043	0.0682	0.8538	0.9982	1.00		
Exchange Rate	0.6082	0.1501	-0.3350	0.3103	0.6371	0.5725	0.5518	1.00	
Export Index	0.7540	0.1295	-0.8818	0.1220	0.8840	0.9900	0.9896	0.5821	1.00

Source: Author's calculation from World Bank datasets

Table 3.2 mentions well about the correlation of variables. Hence, some variables are correlated with this table, such as exports, imports, current account, total expenditures, and export index. These correlations determine that these datasets can be used in the VAR model to find the monetary policy instrument's correlation to Cambodia's dollarized economy. The short period of data can be the challenge to regress in these time series models.

To determine the monetary tools in high dollarization, we might use particular variables to this equation and regression to see more details from each part in markets. Section 3.3 broadens the regressions and equations framework applied with the above data to distribute to see more dollarized market interventions.

### 3.3. Research methodology

To respond to the objective of this research, quantitative and qualitative analyses are used to measure this paper and find out the strategies to promote the riel use in the economy. Some econometric tools are used, such as Ordinary Least Squares (OLS) and Vector Autoregressive (VAR) Model, to the array to respond to the research questions. Some impulse response function graphs are used to figure out each variable's response to the economy, especially with the constraint of monetary policy tools such as M2, foreign deposits, field deposits, exchange rates, and GDP growth.

Due to the introduction to Econometrics book by James Stock and Mark Watson (3<sup>rd</sup> edition) and Sim (1980), Vector Autoregression (VAR) model is set as follows:

$$Y_t = \beta_1 + \beta_{11}Y_{t-1} + \dots + \beta_{1p}Y_{t-p} + \dots + \gamma_1 X_t + \epsilon_{1t} \quad (1)$$

$$X_t = \beta_2 + \beta_{21}Y_{t-1} + \dots + \beta_{2p}Y_{t-p} + \dots + \gamma_2 X_t + \epsilon_{2t} \quad (2)$$

Where the  $\beta$  and  $\gamma$  are unknown coefficients and  $\epsilon_t$  is error terms whereas,  $Y_t$  and  $X_t$  Variables consist of the lagged value of both variables for other parts of the above equation. VAR model is used to regress in this part which its Cambodia data consists of period 1992 to 2015 collected by ADB data.

Eviews and STATA software is applied to this data to get the results based on the above data. In the Panel VAR model, all variables are treated as endogenous and interdependent as in the VARA model. We run its impacts with standard methods to monetary policy tools effect on GDPs and money supply from the dollarized economy in Cambodia. This paper uses the VAR model to estimate the result. The Impulse Response Function (IRF) and regression results will explain more details in the next section.

VAR Model - Substituted Coefficients from result regressions:

$$\begin{aligned} \text{GDP} = & 1.161 * \text{GDP}_{t-1} - 0.156 * \text{GDP}_{t-2} + 312336.24 * \text{OFFICIAL} \\ & \text{EXCHANGE\_RATE}_{(t-1)} - 50688.194 * \text{OFFICIAL EXCHANGE} \\ & \text{RATE}_{(t-2)} + 14577117.99 * \text{M2}_{(t-1)} - 9088391.42007 * \text{M2}_{(t-2)} - \\ & 16866469.273 * \text{EXPENSE}_{(t-1)} + 79751802.6027 * \text{EXPENSE}_{(t-2)} \\ & - 895065830.78 \epsilon_{1t} \end{aligned} \quad (3) \text{ Coefficient from Regression of}$$

Official Exchange Rate as follows:

$$\begin{aligned} \text{OFFICIAL\_EXCHANGE\_RATE} = & - 1.596 * \text{GDP}_{(t-1)} + \\ & 1.711 * \text{GDP}_{(t-2)} + 0.964 \\ & * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-1)} - \\ & 0.112 * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-2)} - 0.873 \\ & * \text{M2}_{(t-1)} + 5.870 * \text{M2}_{(t-2)} + 3.081 * \text{EXPENSE}_{(t-1)} - \\ & 0.235 * \text{EXPENSE}_{(t-2)} + 506.66 \epsilon \end{aligned} \quad (4)$$

Furthermore, the function of Broad Money (M2) in Cambodia

$$\begin{aligned} \text{M2} = & 9.090 * \text{GDP}_{(t-1)} - 1.068 * \text{GDP}_{(t-2)} - \\ & 0.030 * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-1)} + \\ & 0.025 * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-2)} - 0.348 * \text{M2}_{(t-1)} - \\ & 0.258 * \text{M2}_{(t-2)} - 0.249 * \text{EXPENSE}_{(t-1)} + \\ & 0.313 * \text{EXPENSE}_{(t-2)} + 64.360 \epsilon_{1t} \end{aligned} \quad (5)$$

Whereas, Government 's Expenditures function as following:

$$\begin{aligned} \text{EXPENSE} = & 9.482 * \text{GDP}_{(t-1)} - 1.258 * \text{GDP}_{(t-2)} + \\ & 0.0007 * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-1)} \end{aligned}$$

$$\begin{aligned} & + 0.002 * \text{OFFICIAL\_EXCHANGE\_RATE}_{(t-2)} - 0.015 * \text{M2}_{(t-1)} + \\ & 0.0411 * \text{M2}_{(t-2)} + 0.667 \\ & * \text{EXPENSE}_{(t-1)} - 0.076 * \text{EXPENSE}_{(t-2)} - 7.888 \epsilon_{1t} \end{aligned} \quad (6)$$

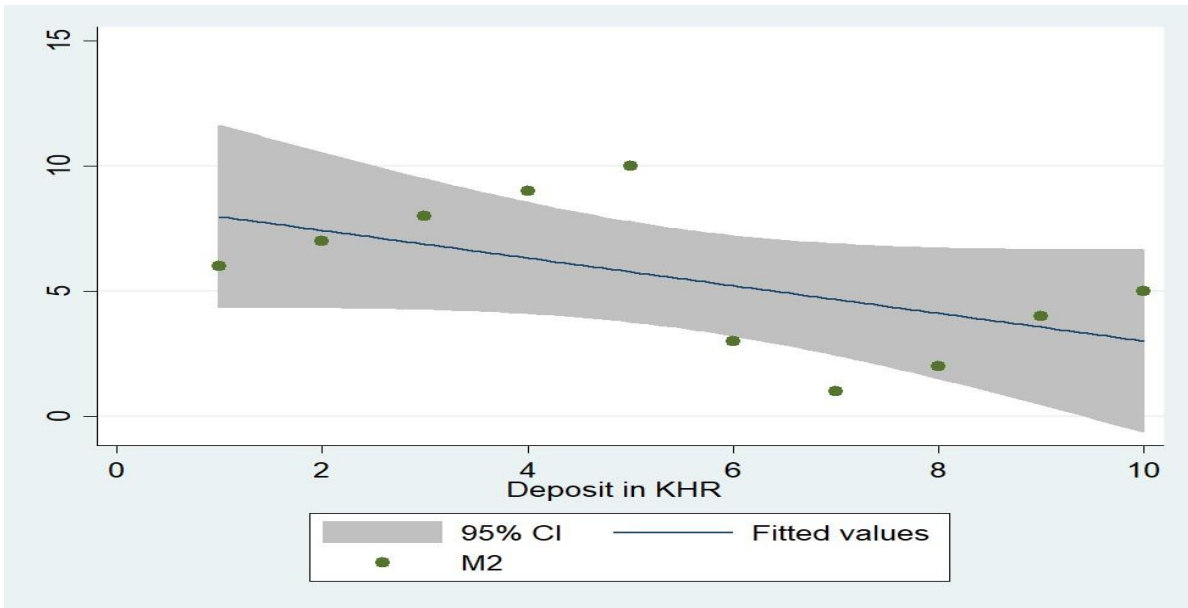
Also, the analysis results from regressions are attached in the next session.

### 3.4. Empirical Results and discussion

To see more details about the dollarization and the constraints of monetary policy tools in the economy, some monetary instruments such as broad money, KHR deposits, exchange rate, foreign deposits, and gross domestic product growth measure its responses and effects on Cambodia. Furthermore, the impulse response function (IRF) is used to measure the independent variables' relationship to dependent variables. The impulse response function might be graphed to show to answer the research questions in this chapter.

Figure 3.1 mentions KHR deposits' impulse in response to broad money (money supply) in Cambodia. This figure shows that KHR deposits in Cambodia have a negative trend and less relationship with the money supply from the NBC. Increasing the riel deposits in the financial system causes less broad money to grow while more than 80% of US dollars are in the market. Because dollarization in Cambodia has a very high market volume, it might affect our people's consumption and belief. Broad money or money supply is less issued. At the same time, our people use more dollars in the market; it can be said that Cambodia loses its income from seigniorage in supplying money in the market and loss of its independent's monetary policy too.

*Figure 3.1: The Response of KHR deposits to the broad money in Cambodia*



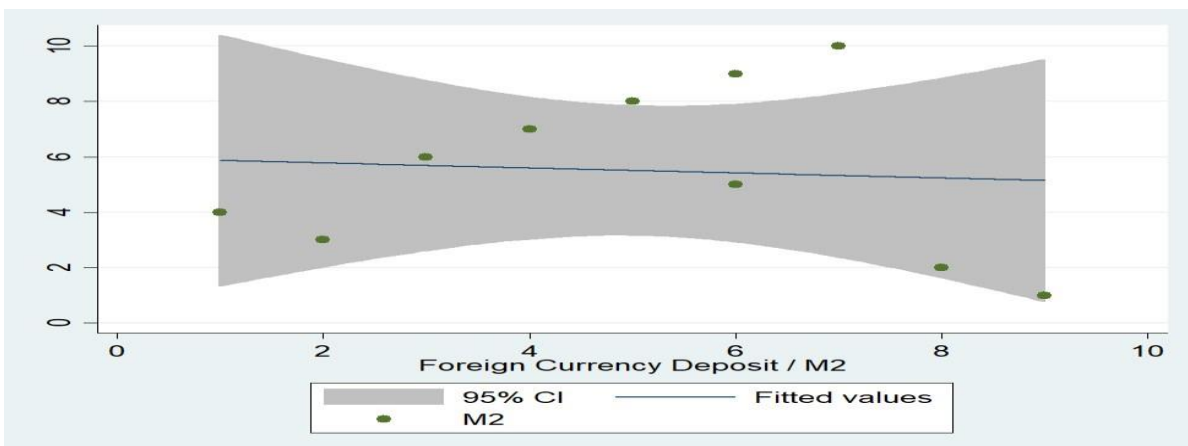
Note: Both variables are in logarithm values.

*Source: Author's based on the NBC data and STATA's illustration*

The trend is slightly going down both variables, whereas dollars have more effects in the market. Furthermore, we have observed more to see the impact of monetary tools on Cambodia's dollarized economy. Figure 3.2 represents the relationship between broad money and foreign currency deposits in the financial system as the following illustration. It shows that the relationship of foreign currency deposit in Cambodia has positively correlated with supplying money

from the central bank. It can be the reason for more economic activities pushing up the demand for KHR currency too. The transition of foreign currency deposits has been so high compared to our KHR currency in Cambodia. It is also a challenge for policymakers to slope the growth of KHR currency in the market. Due to the foreign currency deposit (X) shows from 8 to 9 volume has meager broad money in the market among another period. To clearly determine the relationship with these above effects, we might check the other main variables to GDP in the economy in the following figure.

*Figure 3.2: The relations of foreign currency deposit and broad money in Cambodia*



Note: Both variables are in logarithm values.

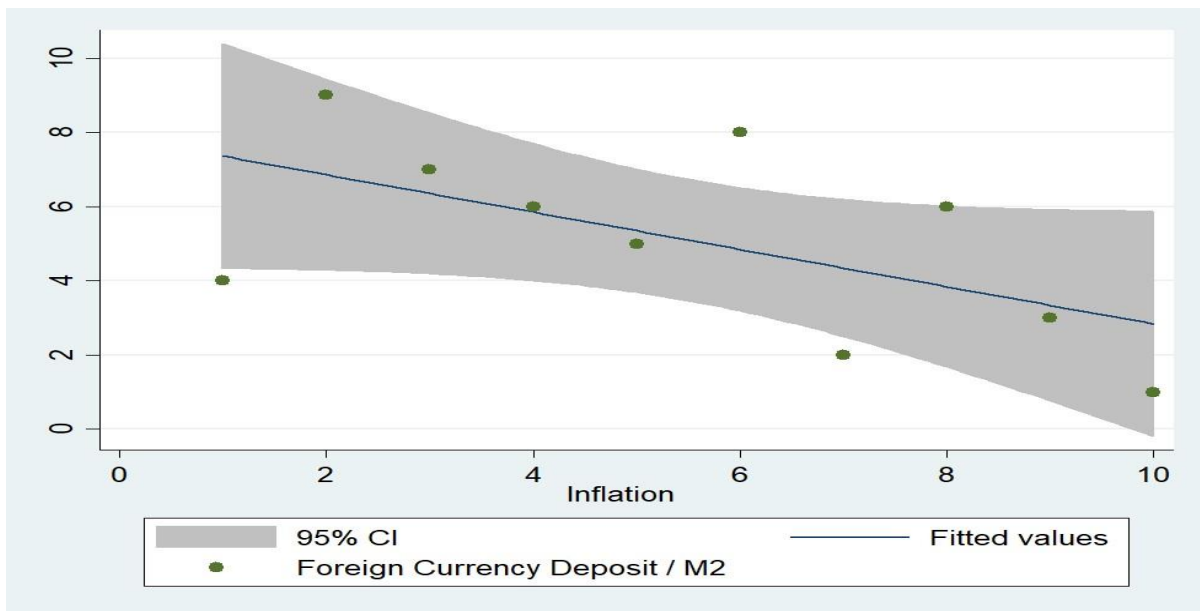
*Source: Author's based on the NBC data and STATA's illustration*

Inflation in Cambodia is also the most critical case. The central bank usually focuses on it and monitors it every day and time. Hence, Figure 3.3 mentions the inflation and foreign currency deposit in the banking system. This figure shows that the response of foreign currency deposits is a negative relationship with inflation. It can be said that foreign currency deposit has a negative trend with inflation in Cambodia. The illustration determines that dollarized economy might have less impact on the foreign currency deposit to inflation while it is not KHR currency. Also, the riel deposit has a positive trend to inflation, as in figure 3.4. It means that increasing riel deposit causes more inflation

in the market. Based on this mechanism, NBC can use this instrument to influence the economy.

This sign is the proper thought from the reality of money deposit and inflation. It can be stated that Cambodian inflation has correlated well with the riel deposit. We can say that the increase in Cambodia's money supply can cause an inflation rise in the economy. Furthermore, to investigate the instrument's impact on inflation, the official exchange rate has shown that the exchange rate has positively correlated with inflation growth. It is possible to declare that the more sensitive of exchange rate can push up the inflation too. It is the primary monetary tool in the dollarized economy to intervene in the market than other tools, as in figure 3.5.

*Figure 3.3: The relationship of foreign currency deposit and Inflation in Cambodia*

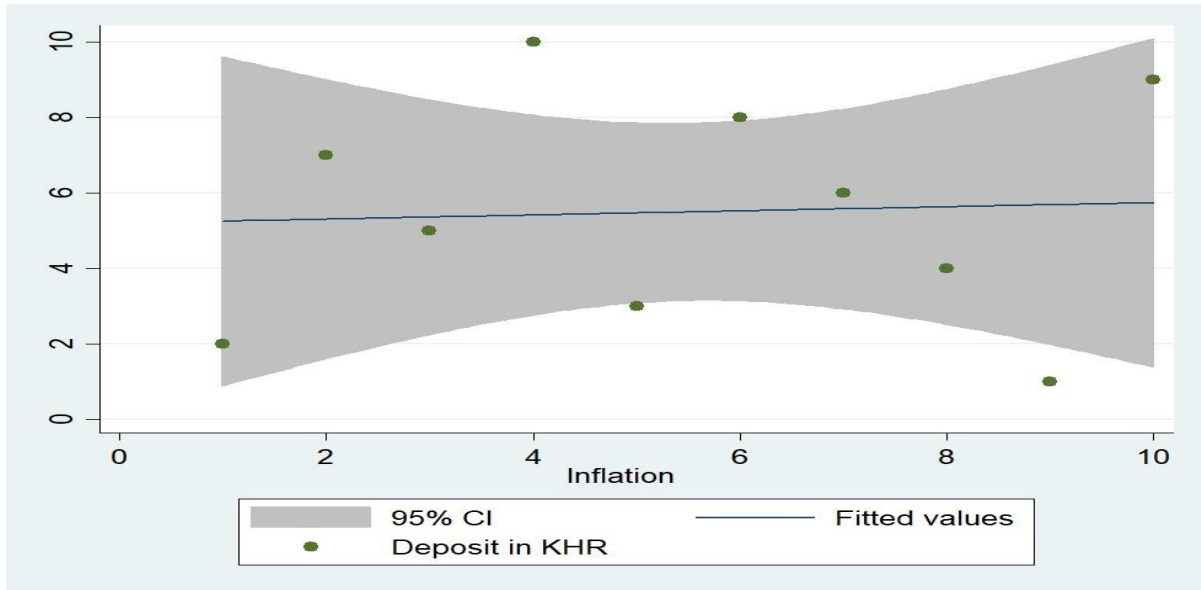


Note: Both variables are in logarithm values.

*Source: Author's based on the NBC data and STATA's illustration*

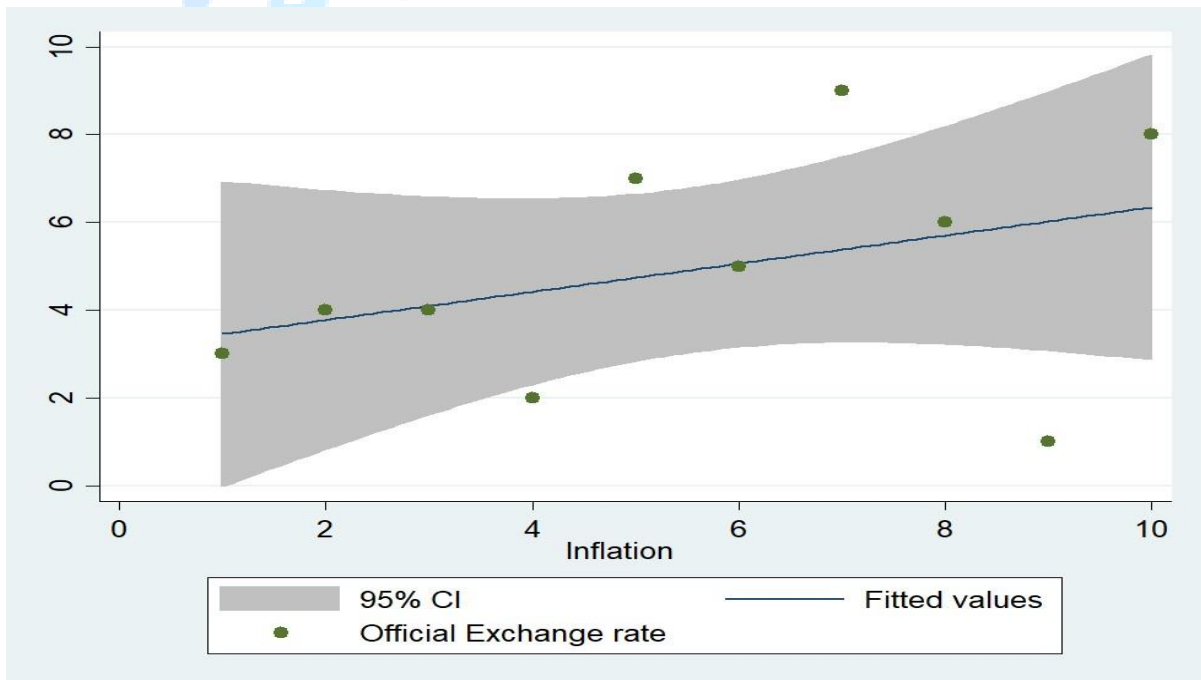


Figure 3.4: The correlation of KHR deposit to the response of the inflation



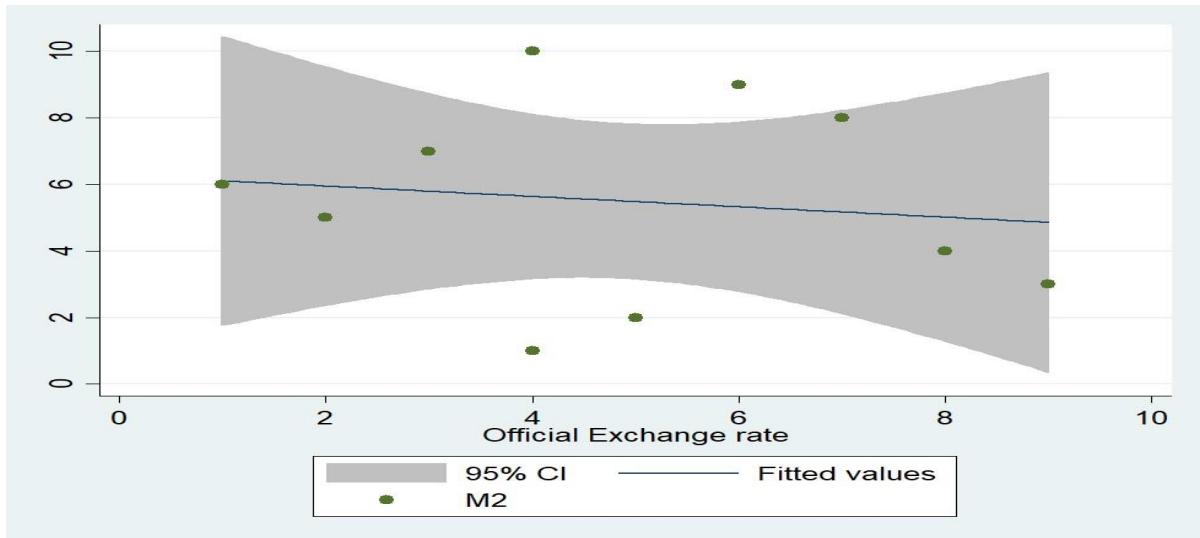
Source: Author's based on the NBC data and STATA's illustration

Figure 3.5: The response of official exchange rate to inflation in Cambodia



Source: Author's based on the NBC data and STATA's illustration

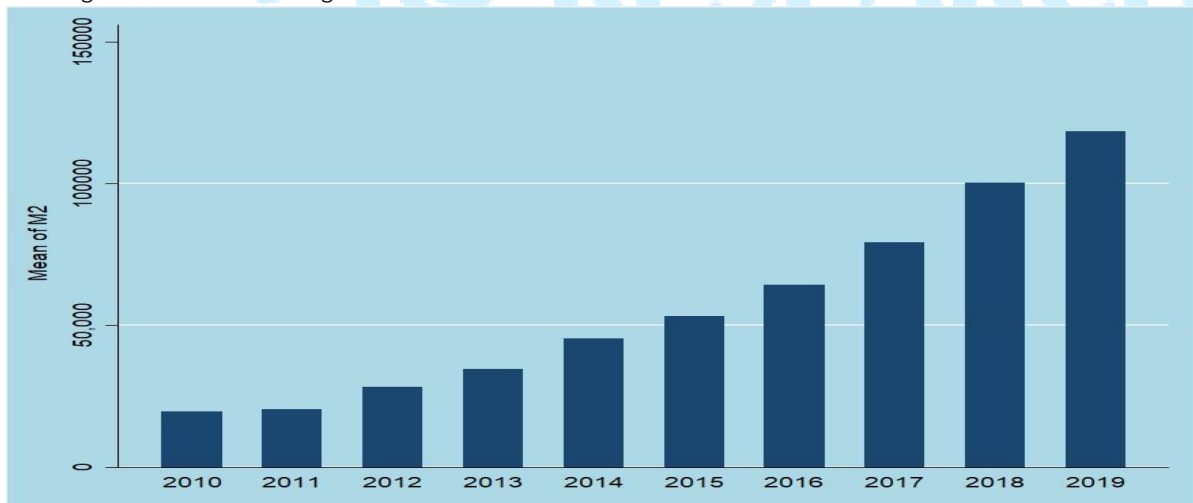
Figure 3.6: The correlation of broad money and official exchange rate in Cambodia



Source: Author’s based on the NBC data and STATA’s illustration

Figure 3.7: The trends of broad money and years in Cambodia  
 The correlation between broad money and the official exchange rate is shown in figure 3.6. The trend of them

seems to slow down with the official exchange rate. It means that the broad money supply has fewer correlations with the official exchange rate in Cambodia.



Source: Author’s based on the NBC data and STATA’s illustration

Figure 3.7 states that the money supply has increased annually from 2010 to 2019. It shows that the demand for the KHR money supply in the market finds that people

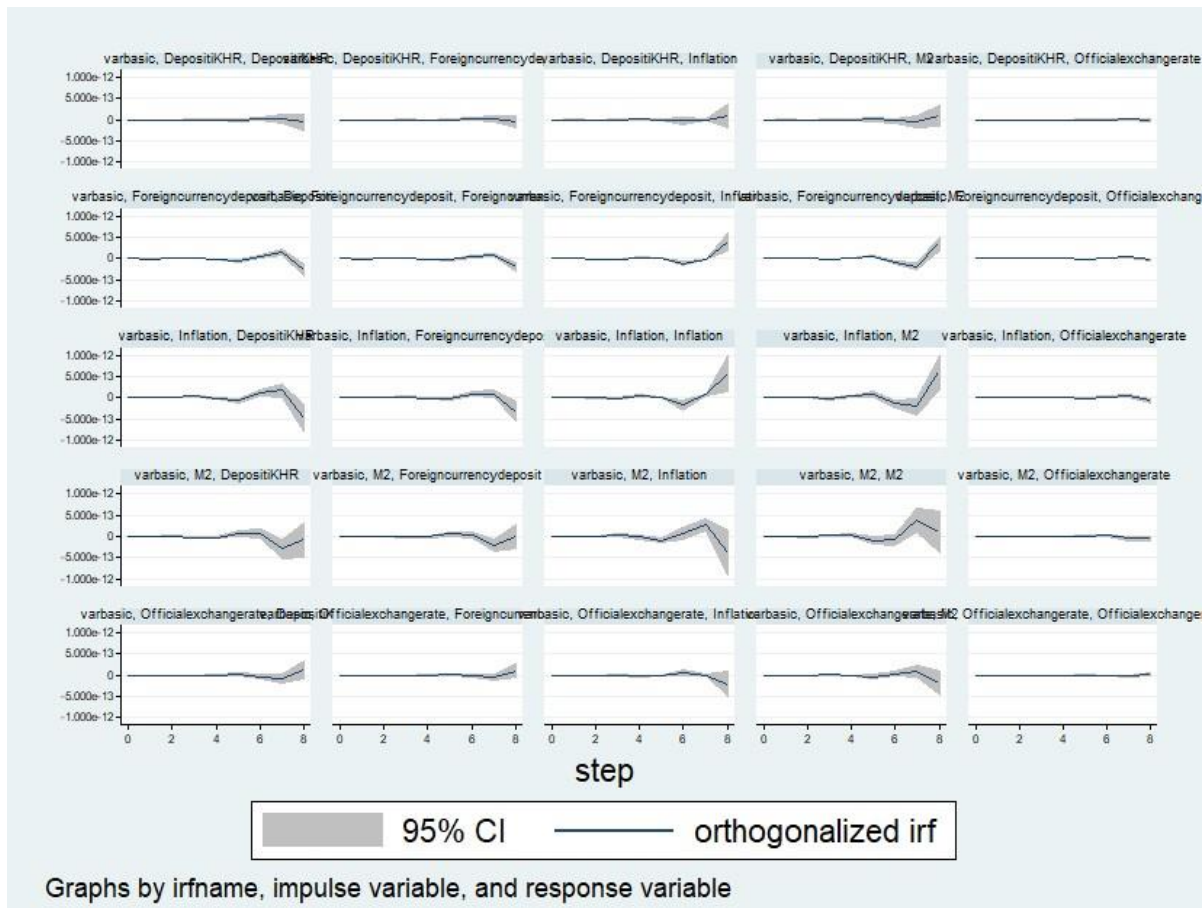
gradually believe in the domestic currency. Other instruments like reissues of domestic currency are also new norms to encourage people to believe in our currency and other new policies such as changing old banknotes, NCD, promoting KHR currency, and other relations. Sometimes, we can say that the higher demand for KHR currency,

because of the bigger financial market, is a plus to push up domestic currency growth. NBC (2018)<sup>109</sup> mentions that commercial banks dominate Cambodia's banking system by surging microfinance institutions' roles. Meanwhile, the first issuing KHR denominated corporate bond marked a significant step in the financial market. In addition, the loan policy of the riel usage gradually increases NBC to all commercial banks and other institutions.

The volume of dollars in the market is very high and without controlling flow much by this constraint. Since

1992, when people started using the dollar as a currency in Cambodia, the dollar share has reached more than 70% of the total money. Hence, to measure some responses to the economy, some monetary policy tools are used to respond to this dollarized economy, as figure 3.8. A Vector Autoregressive model (VAR) is employed to graph the Impulse Response Function (IRF) to see its responses to Cambodia's economy.

*Figure 3.8: The Impulse Response Function (IRF) of Monetary Policy Tools after VAR Model*



*Source: Author's calculation from NBC and ADB data from 1992 to 2015*

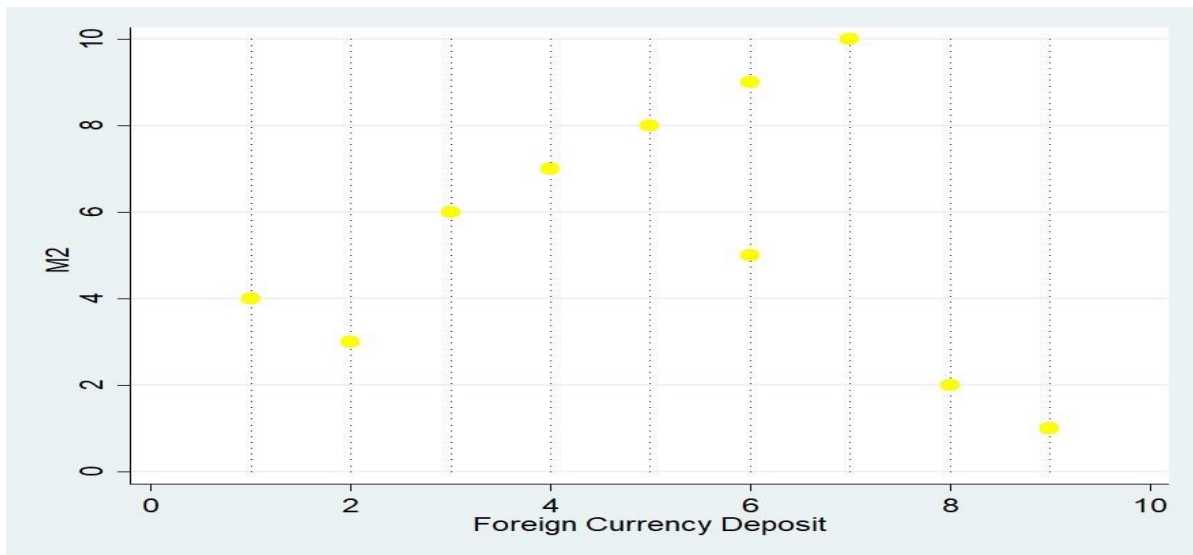
These graphs show that Cambodia's economy in 95% Confidence Interval of these graphs has more sensitivity to dollarized economy. The impulse response function mentions that foreign currency deposit has anchored the official exchange rate. Simultaneously, the positive trend of broad money seems to have a positive correlation with foreign deposits. Otherwise, M2 also pushes up the KHR

deposit too due to this figure. For the inflation trend, M2 positively increases the inflation rate, as in the picture.

In the interim, figure 3.9 mentions the relationship of broad money (M2) to foreign currency deposits in the banking system. The figure illustrates that broad money has a small proportion in the economy than foreign deposits in banking. We can say that dollarization in Cambodia enormously increases over time and makes the losses of monetary policy interventions to markets. Some tools of monetary policy in Cambodia might have been less

empowered to react to the economy. Yet, we might find one by one to see the correlation and responses of monetary tools to the main variables as follows. As noticed, we approach the VAR model first and generate the graph of impulse response function by each variable.

Figure 3.9: The Relationship of Broad Money and Foreign Currency Deposit in banks

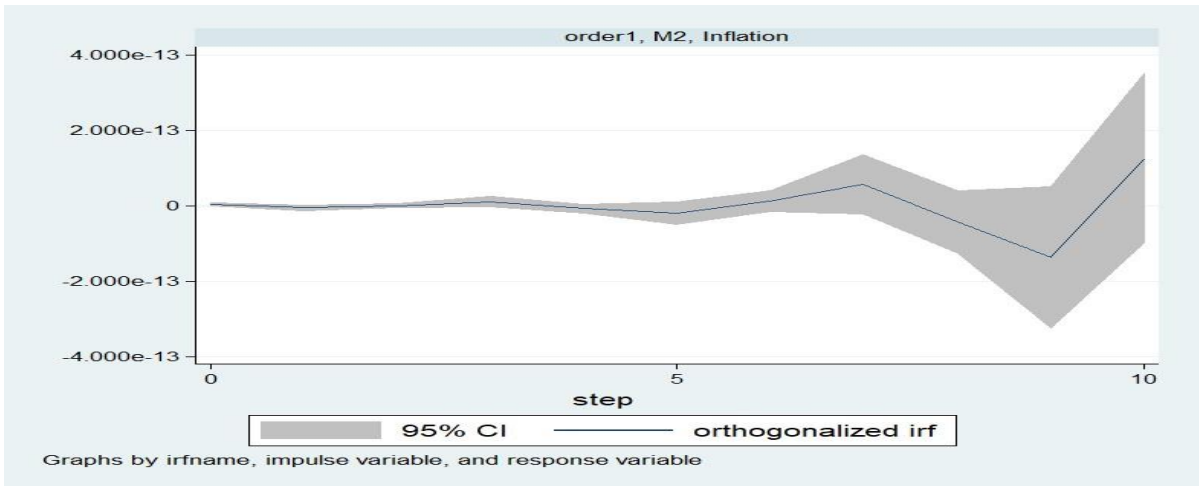


Source: Author's based on the NBC and ADB data

All variables are used to integrate order 1( $I(1)$ ) except the GDP gap variable in order 0. It can be said that  $I(1)$  variables need to be differenced and stationary first. Moreover, residual graphs are in appendix 1. The Vector Autoregressive Model (VAR) estimated with lags two given the lags minimizes the Akaike Information Criterion (AIC) and SIC, consisting of the model's goodness of fit. The variables to the GDP growth and money supply are identified on the VAR basis using the Cholesky decomposition. The Cholesky method needs more identification of the ordering variables from the exogenous variables to endogenous variables.

The response of the money supply (M2) forces inflation in markets. We might shortly say that more money in the market might spoil the economic growth by inflation. It is not a surprise because of the high dollarization in Cambodia, which complies with the loss of flexibility in supplying money to the market. This finding shows the same result paper of Sadeghi et al., 2013 about the broad money and inflation collected in Iran from 1988 to 2005. Otherwise, if we look at other variables which affect GDP growth and M2 in Cambodia, we might look into two sides for exchange rates, such as market exchange rate and official exchange rate, as mentioned in figure 3.11.

Figure 3.10: The Impulse Response Function (IRF) of M2 and Inflation after VAR Model

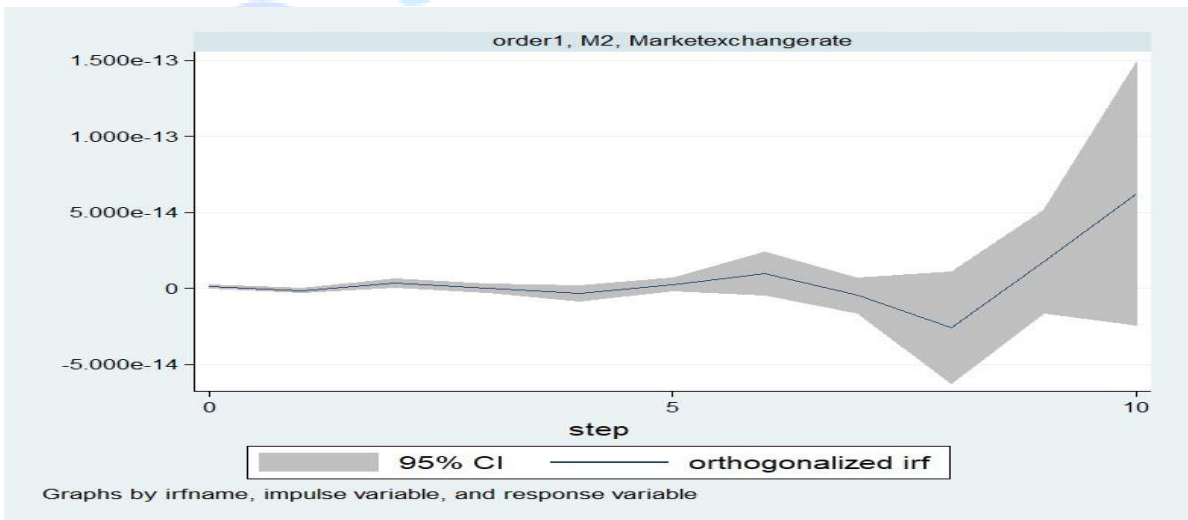


*Source: Author's based on the NBC data*

The central bank can control only the exchange rate and other new financial instruments such as NCD, Liquidity-

Provided Collateralized Operation (LPCO) due to the high dollarization in the economy.

*Figure 3.11: The Impulse Response Function of M2 & Market Exchange rate after VAR Model*

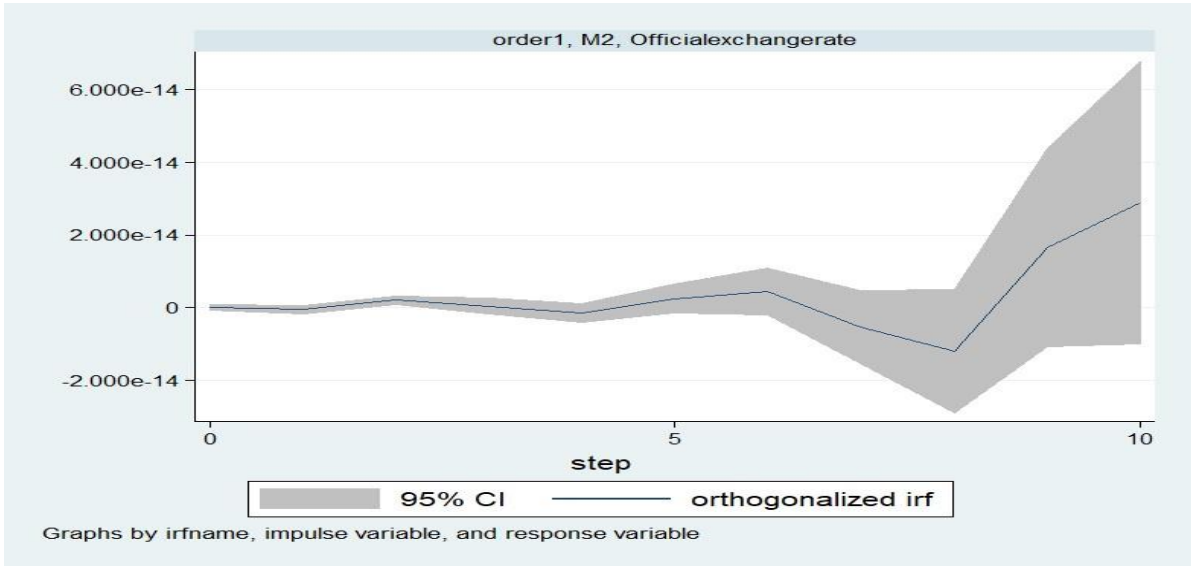


*Source: Author's based on the NBC and ADB data*

The illustration shows that it is positively related to the M2 and market exchange rate in Cambodia. But this response seems smaller than the official exchange rate due to figure 3.12.

However, official exchange rate responses have more sensitivities to M2 than market exchange rates in the following years. In this sense, we might think carefully of the official exchange rate to intervene in the high dollarized economy as Cambodia.

*Figure 3.12: The impulse response function of M2 and official exchange rate after VAR Model*



Source: Author's based on the NBC and ADB data

Table 3.3 : The Estimated Result of M2 and Official Exchange rate after VAR Model; the p-value in parenthesis and T-Value

After converting all the data series to be stationary, the next step is to determine the VAR model's optimal lag to be run. Due to repressors, AIC, and SBIC in the appendix, the VAR model's optimal lag is two; hence the VAR model is run with a lag equal to two.

Variables	GDP	Official Exchange Rate	M2	Expenditure
GDP(t-1)	1.161337	-1.60E-07	9.09E-09	9.48E-10
	(0.12959)	(6.90E-08)	(5.90E-09)	(1.50E-09)
	[ 8.96162]	[-2.32643]	[ 1.54505]	[ 0.63091]
GDP(t-2)	-0.15603	1.71E-07	-1.07E-08	-1.26E-09
	(0.1336)	(7.10E-08)	(6.10E-09)	(1.50E-09)
	[-1.16786]	[ 2.41954]	[-1.76105]	[-0.81189]

OFFICIAL EXCHANGE RATE $t$	312336.2	0.964123	-	0.03006***	0.000789***
	(0.336943)	(0.17841)	(0.0153)	(0.00391)	
	[ 0.92697]	[ 5.40411]	[-1.96505]	[ 0.20196]	
OFFICIAL_EXCHANGE_RATE $(t-2)$	-50688.2	-0.112027	0.025518**	0.002228**	
	(277057)	(0.1467)	(0.01258)	(0.00321)	
	[-0.18295]	[-0.76366]	[ 2.02857]	[ 0.69340]	
M2(t-1)	14577118	-0.873116	-0.34823	-0.01527*	
	(5432025)	(2.87616)	(0.24663)	(0.063)	
	[ 2.68355]	[-0.30357]	[-1.41192]	[-0.24237]	
M2(t-2)	-9088391	5.870982	-0.2584	0.04113*	
	(4539788)	(2.40373)	(0.20612)	(0.05265)	
	[-2.00194]	[ 2.44244]	[-1.25364]	[ 0.78115]	
Expenditure(t-1)	-1.7E+07	3.08161	-0.24904	0.667955	
	(3.70E+07)	(19.3807)	(1.66191)	(0.42453)	
	[-0.46079]	[ 0.15900]	[-0.14985]	[ 1.57339]	
Expenditure(t-2)	79751803	-0.235938	0.313749	-0.076909	

	(3.70E+07)	(19.6945)	(1.68882)	(0.43141)
	[ 2.14411]	[-0.01198]	[ 0.18578]	[-0.17827]
Error term(E)	-8.95E+08	506.6647	64.36002	-7.888694
	(6.90E+08)	(367.051)	(31.475)	(8.04021)
	[-1.29116]	[ 1.38036]	[ 2.04480]	[-0.98115]
R-squared	0.997644	0.946845	0.383816	0.693697
Adj. R-squared	0.996194	0.914133	0.004626	0.505203
Sum sq. residues	1.22E+18	342497.5	2518.456	164.3384
S.E. equation	3.07E+08	162.3144	13.9186	3.555477
F-statistic	688.0418	28.9457	1.0122	3.680209
Log likelihood	-455.33	-137.3994	-83.3606	-53.33639
Akaike AIC	42.21177	13.30904	8.396418	5.666944
Schwarz SC	42.65811	13.75537	8.842753	6.11328
Mean dependent	7.87E+09	3755.989	26.18638	5.777915
S.D. dependent	4.97E+09	553.9175	13.95091	5.054573
Determinant residual covariance		5.48E+23		
Log-likelihood		-726.1243		



Akaike information criterion (AIC)	69.28403	
Schwarz Criterion(SC)	71.06937	

*Source: Author's calculation*

The result revealed that official exchange fluctuation negatively shocks Cambodia's money supply growth (M2) (Coef=-0.03006). It can imply that a one-unit increase in the exchange rate forces the money supply to about 0.03 or 3%. It makes us know that NBC has a narrower monetary policy to practice in the dollarized market. Also, inflation must be controlled carefully while exchange rate and M2 are absorbers' core tools to push inflation in the dollarization economy. These two instruments are trendy in Cambodia; for then, other devices are not included. Suppose we take a look at other variables such as expenditures. It shows that the official exchange rate is a positive correlation to government expenditures (Coef=0.00789). This official exchange rate is the rate for foreign exchange currency only, such as dollars and KHR riels. This result discovers that the official exchange rate can push positively to grow for the government's expenditures. Yet, Cambodia's monetary instruments should be carefully observed to intervene in markets.

The official exchange rate's lagged value positively correlates to NBC's money supply with time (t-2). We can say that the central bank's official exchange rate can foster the money supply growth (M2) in Cambodia. There is a coefficient of about 0.0255 and 0.0022 to the money supply (M2) and government expenditures in the last period (t-2). It seems a highly different result from the current period. At the same time, the previous exchange rate increased the government expenditures by 0.0022 or 0.2%. This figure presents that government expenditures have a positive trend from the last exchange rate of foreign currency. It might be because the government used more dollars which they borrowed or got aid from overseas. Due to this money, the government can use this money to invest in infrastructures and others.

To know more clearly, the lag of money supply to expenditure (t-1) has negatively affected government expenditures (Coef=-0.015). It implies that more money supply (M2) from the last period (t-1) can harm government expenditures. It might be from the fluctuation of inflation

and the current exchange rate. The central bank feels the hardship of employing the monetary tools while strong dollarization occurs in the economy as in Cambodia. The narrow instrument and economy might be beyond reasons. Additionally, the lag period of t-2 mentioned that it positively correlates with government expenditures (Coef=0.0413).

### *Conclusion*

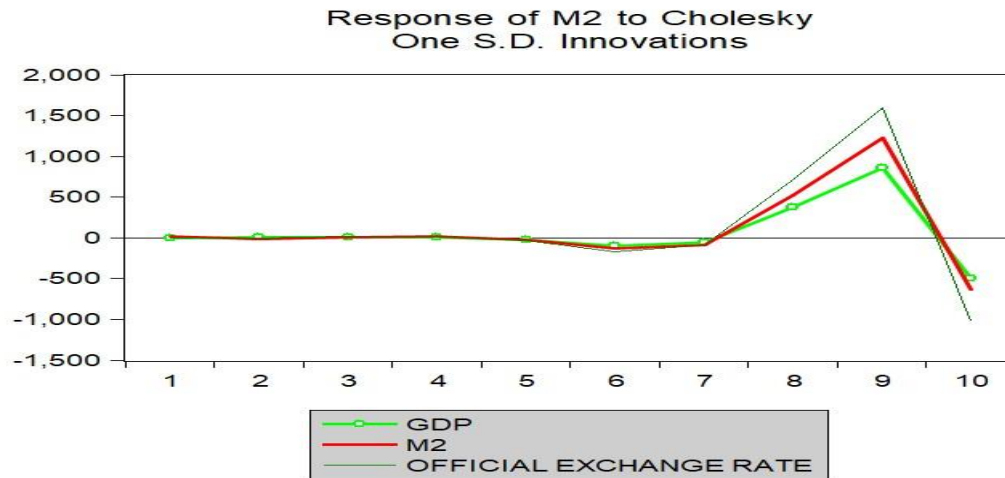
In conclusion, dollarization is huge in Cambodia, forcing more hardships on the central bank to implement her monetary policy in the economy. The market forces a higher volume of dollarization in Cambodia and struggles to deal with its seigniorages and other monetary policy constraints to economic growth. This chapter tries to discover these challenges using the NBC and World Bank data from 1992 to 2015. In this context, the measurement of dollarization has a proxy from the foreign currency in banks as in the above impulse response function. Concurrently, the limit of monetary tools is the exchange rate, money supply, and others. The VAR model shows that only the official exchange rate and M2 have correlated well with government expenditures and are averse. Using the policy tools is vital to see more correlations between GDP growth and money supply and government expenditures. The estimation results provide more details of policy tools in the dollarized economy which are used in Cambodia. Hence, only the exchange rate has negatively impacted the money supply (M2) of Cambodia.

Some encouraged policies such as printing new banknotes, LPCO, NCD, financial literacy, and Bakong Payment Platform could encourage market use. Rising digital money is currently signed in Cambodia and added value to the public to use the Khmer Riels. At the same time, the official exchange rate pushed more government expenditures in the economy.

In contrast, the money supply in the last period has essentially correlated with government expenditures. In this case, the central bank should carefully consider using the exchange rate in the context of higher dollarization in the economy. To avoid increasing the inflation in the market. It is necessary to create several digital financial goods to reduce dollars usage and programs like promoting

the KHR on TV and radio. Financial literacy is more critical for Cambodians to acknowledge their use of national currency and belief in it.

*Figure 3.13: Response of M2 to GDP and Exchange Rate in Cambodia*



*Figure 3.14: Response of exchange rate to GDP, M2, and Exchange Rate in Cambodia*

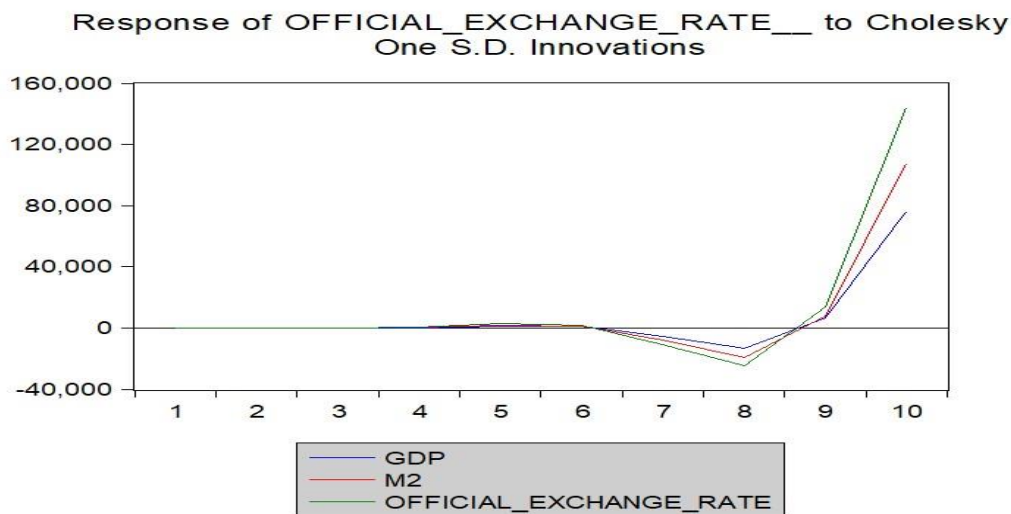


Figure 3.15: Response of expenditures to GDP, M2, and Exchange Rate in Cambodia

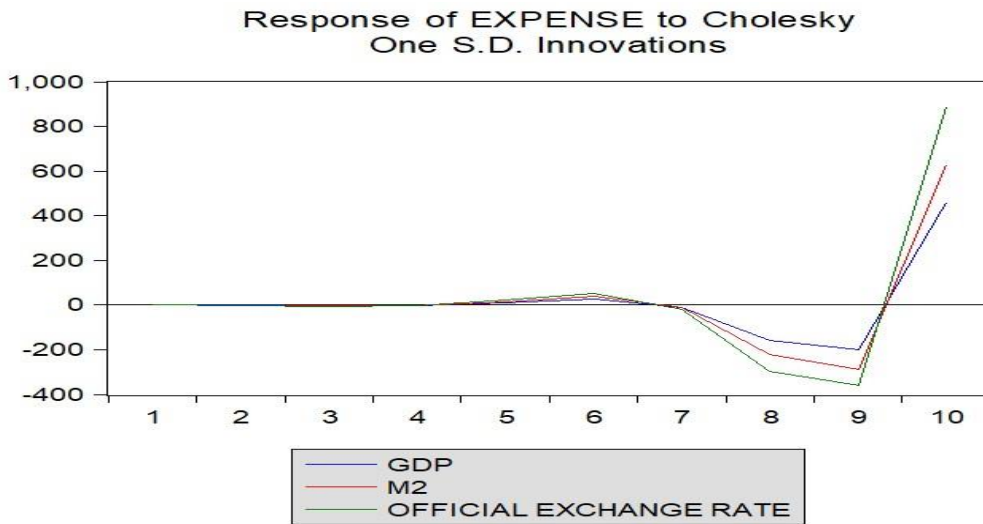


Figure 3.16: Response of Goods Export to Cholesky One S.D. Innovations

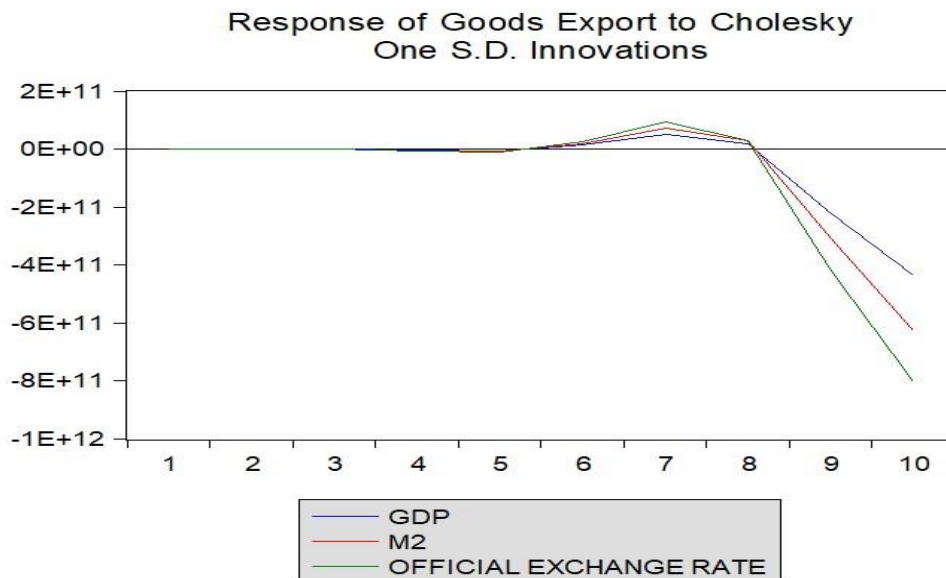


Table 3.4: Robustness Check: Ordinary least squares (OLS) regression

Variables	GDP Growth		GDP Growth	
	Coefficients	Standard Error	Coefficients	Robust Standard Error
M2	0.0627**	0.0273	0.0627	0.0374
Exports	-1.0779**	0.4753	-1.0779*	0.6009
Imports	1.0658**	0.4689	1.0658*	0.5937
Exchange Rate	0.7848***	0.1538	0.7848**	0.3016
Total Employment	-0.4357	0.3014	-0.4357*	0.2247
Current Accounts	1.05e-10	6.50e-11	1.05e-10**	4.99e-11
Constants	-5.6813***	1.2690	-5.6813**	2.4891
Observations	24		24	
R-Squared	0.7576		0.7576	

Note: GDP growth in the dollarized economy in Cambodia and M2 is printing money from the central bank.

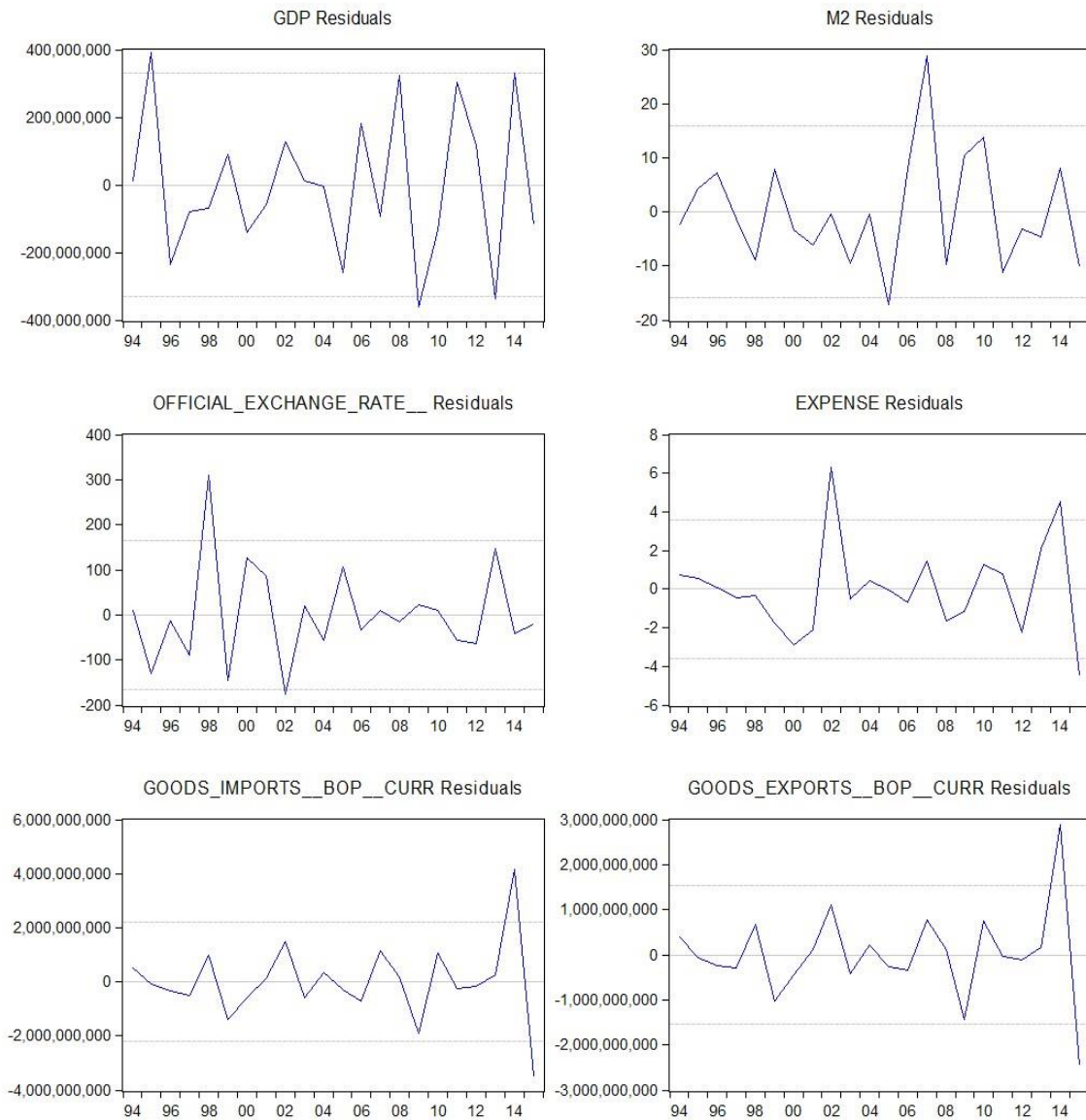
VCE cluster is used to proxy and control all equation problems to get a smooth result in the above table. Furthermore, STATA version 14 is implemented in this regression too.

*Source: Author's calculation from World Bank data*

Remarkably table 3.4 shows that M2 positively correlated with GDP growth in the economy. It means that broad

money is significant in the higher dollarized economy, such as Cambodia. Some encouraging policies like printing new notes, LPCO, NCD, financial literacy, and Bakong should be implemented to foster the market's riels use. The trust of people in Khmer Riels is very vital and takes time. At the same time, Cambodia Export has very limited to response the growth in current situations. Importing goods are positively correlated to growth; more imports are shared to GDP growth in Cambodia. In the meantime, the exchange rate is positively impacted on the growth. This finding might be the same result as Seilimi and Valdrina (2017)<sup>110</sup>.

Figure 3.17: Residuals of GDP, M2, Exchange Rate, Export and Imports goods and Expenditure in Cambodia



## . RESULT

The incidence of conflict has been more severe and its impact longer-lasting than two decades, owing to internal fragmentation and concerns about macroeconomic instability. Subsequently, individuals and business agents have no confidence in domestic currency, and assets-denominated currency would be hedged through dollarization. This phenomenon provided limited investment opportunities in local currency and inadequate demand for formal credit in national currency.

### 4.1. The Cambodian Experience with Dollarization

Referring to Hill and Menon (2013)<sup>111</sup>, Cambodia got independent from France in 1953. It experienced a 17-year period of relative political stability and steady economic growth starting from a development base similar to many Southeast Asia Countries. The Khmer riel was the legal tender used for financial transactions and as a value store. Following the March 1970 coup d'état that overthrew the government, the country was drawn into the sub-region of international violence and, in the end, into civil conflict.

A flexible exchange rate system was adopted and unified in 1971. Due to economic difficulties, a dual exchange rate system with a "base rate" for most transactions was reinstated in 1973. The other was the "preferential rate," which was used for aid-related imports and services. Markedly, Cambodia had its first experience with limited dollarization during the LON NOL regime (1970-1975), as an increase in US military personnel and assistance brought the dollar into the country.

Cambodia has a unique history in the world, as it was formerly the only country in the world to abolish its currency. The Pol Pot dictatorship lasted three years, from 1975 to 1979, was Cambodia's bloodiest period. Most things were destroyed during this time, including the central banking system, which included Riel banknotes and the destruction of the NBC headquarters. Holders of riels became impoverished very immediately, and residents ultimately rejected the currency throughout that time.

A ban on private property, banks, and money was part of the Khmer Rouge's extreme revolutionary experience (an "agrarian moneyless society") from 1975 to 1979. It threw the country into economic and human calamity, killing an estimated 1.5 million people, or nearly a quarter of the

population. The Khmer Rouge was expelled from Cambodia by the Vietnamese in 1979.

The Khmer riel was restored as the native currency under the new transition regime in early 1980 (De zamarózy and Sa, 2002)<sup>112</sup>.

The socialist economic model established an official dual exchange rate system simultaneously as a state-owned nonbank that performs central, commercial, and development banking functions. After all, the Cambodian economy remained in a distressing condition. Despite this, the Khmer Rouge Regime's unique experience remained fresh, and the Cambodian spirit in the Khmer Riel stayed intact. Many Cambodians resorted to using other valuable goods as a medium of exchange, such as gold, silver, or rice.

Dollars appeared to flow into Cambodia in the mid-1980s; as the United Nations (UN) dispatched humanitarian and emergency aid, international non-governmental organizations were allowed to return, remittances from abroad were resumed. During the 1980s, the country only achieved limited monetization, and most domestic transactions were rested on the barter system, with gold being the universal means of transacting and hoarding.

In 1989, the Cambodian central bank emitted money equivalent to 20% of government budget expenditure, which climbed up to 40% in 1990. Banknotes should have been printed according to demand and supply in reality, or otherwise, inflation will appear. The Cambodian government's revenue, notably from taxation, was limited in the early 1990s. During 1988-1991, the Vietnamese were disjoined from Cambodia and leaving the unsettled political situation in the wake. During that period, enormous central bank financing of recurrent budget deficits resulted in high inflation, in the range of 90% to 177% a year (end-period), and an erosion of public confidence in the domestic currency. As a result of the preceding, the budget was financed by the central bank. Consequently, and accumulatively, the national money supply was expanded by 241%, 29%, and above 200% in 1990, 1991, and 1992 respectively (Im et al., 2007a)<sup>113</sup>.

Between 1991 to 1993, the UNTAC took control of the country's administration. The UNTAC has represented the UN's costliest peace restoration effort to date and resulted in nearly overnight dollarization of the urban economy. This major nation-building operation in Cambodia involved stationing up to 22,000 UN militaries and civilian personnel



nationwide. It estimated the total cost of the two-year operation close to 2 billion US dollars. The UNTAC personnel arrived with dollars in cash and, needing a wide array of services (local staff, housing, transportation, interpretation, etc.), goods in a large barter economy quickly introduced Cambodia to extensive dollarization. This infusion of physical cash in dollars was exacerbated by the return of significant numbers of Cambodian refugees and expatriates from abroad at the same time, carrying with their dollars or Thai baht. Thus, foreign currency deposits in Cambodia's banking system began to rise dramatically.

In 1992, Cambodia witnessed three-digit hyperinflation, with the riel's value drastically depreciating and riel holders' purchasing power decreasing. It was a strong motivator for people to use the US dollar. They have become an increasingly important part of the banking system's deposit base since 1992.

Consequently, the riel depreciated between 1990 and March 1992 from 800 to 2,600 to the US dollar. It plummeted by nearly 225 percent. Another anxiety arose as a result of hyperinflation: the loss of confidence in the Khmer Riel. The Riel has shown itself to be exceptionally responsive to political shocks in the past. The Riel devalued by 80 percent in under 24 hours on March 19, 1993, from 2,600 to 4,800 per dollar (Irvin, 1993)<sup>114</sup>.

In July 1997, the political situation deteriorated to the point where factional warfare occurred. The economic condition worsened as the Asian crisis unfolded, GDP slowed, the government sought budget financing from the Cambodian National Bank for the first time since 1993 in 1998, and inflation rose to double digits.

The dollarization of the Cambodian economy continued in 1994-1996 due to sustained massive inflows of international assistance and private transfers, as well as political uncertainties, seen by the continued increase in foreign currency deposits. However, the fighting in July 1997, together with the regional financial crisis and lowered trust, national elections were held on July 26, 1998. Still, it

took until November 1998 for a coalition government to be formed and domestic stability and international trust to be restored. The riel fell about 20% in mid-1997 due to the expansionary strategy and the regional financial crisis.

Consequently, macroeconomic performance quickly recovered from the relapse in 1997-1998 and has notably improved with estimated annual economic growth of more than 5% from 1999 to 2001. The Consumer Price Index (CPI, end-of-period) became negative during this time. The garment, tourist, and agricultural sectors had considerable growth, resulting in additional foreign currency inflows for the second-largest dominance. The liberty of monetary policy remains constrained by the widespread use of cash, a high level of dollarization, low reliability in domestic currency and banking systems, and the absence of market-based monetary tools. Even though remarkable macroeconomic steadiness for the last ten years, dollarization in Cambodia illustrates no sign of a slowdown. Also, most bank intermediation is still affected by the US dollar. NBC will face challenges to carry out its monetary policy if the degree of dollarization is pursued to be high and bank intermediation prolongs to be effected in the US dollar. In such circumstances, the whole process will remain an empirical matter and concern for the government (Khay, A. (n.d.))<sup>115</sup>.

Zykova, (2017)<sup>116</sup> cited from Ize & Powel (2004, p. 3-4) diagnose four type of causes of dollarization: *macroeconomic hedging dollarization*, which has its root in investors risk aversion; *market imperfections dollarization*, that is connected with the costs of financial intermediation and determined by the efforts of lenders and debtors to slash down expenditures associated the debt repayment under the conditions of inefficient institutional and regulatory environment; *default dollarization*, which appears due to the problem of coordinating lenders who credit in various currencies; and the *moral hazard dollarization*, emerging due to insurance of deposits or other guarantees in a dollarized financial system.

#### 4.2. Measuring Dollarization in Cambodia

After a gradual liberation of international investment, the foreign currency began to circulate in the economy in 1989, Cambodia was not heavily monetarized in 1990. Dollarization happened mainly during the UNTAC period (1991-1993) when the American dollar flowed into the economy. Consequently, Cambodian dollarization could be seen as a direct result of the destruction of economic and

financial institutions following the 1970s, economic mismanagement throughout the 1980s, and massive inflows of US dollars during the UNTAC period in the early 1990s. In contrast to other countries where macroeconomic instability and hyperinflation hugely triggered or escalated dollarization. Cambodia's final and determining source of dollarization resulted from an administrative and political event. In December 2011, the share of Foreign Currency Deposits (FCDs) in broad money (M2) reached an all-time high of 82 percent (Hill and Menon, 2013)<sup>117</sup>.

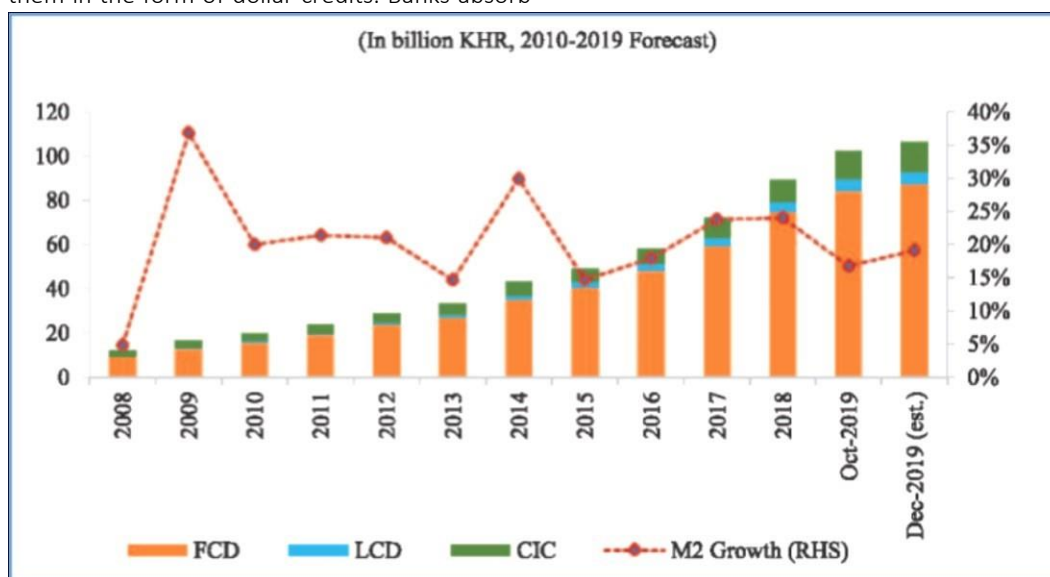
The foreign currency typically dominates bank deposits, but the local currency is frequently utilized for budget implementation, including paying taxes and civil servant wages. Depending on the country's experience, payments are possible in one or both currencies. Although the KHR is the legal tender of Cambodia, the country's monetary system is marked by de facto dollarization, outcoming in an unofficial multi-monetary system. Residents apply the dollar extensively, but it is not legal money. The riel was used mainly in urban areas for small currency transactions and divisionary money (Zamaróczy and Sa 2002b).<sup>118</sup>

We can expect that if the money supply cannot keep up with economic expansion, a money shortage will limit an economy's ability to grow further. In a highly dollarized country like Cambodia, expanding the dollar supply is critical to maintaining economic growth. Annual inflows of substantial sums of dollars to Cambodia have funded the additional currency required to sustain growth. A portion of the influx of dollars gets circulated as cash across the country. The banks got part of those funds and then extended them in the form of dollar credits. Banks absorb

money in a variety of ways, including deposits, borrowings from overseas, foreign direct investments, banks, and revenues abroad. The dollar deposit currency has been enlarged to several times the size of the original dollar deposits during the credit generation procedure. The total supply of the dollar is equal to the sum of the number of dollars in circulation and the number of dollars held in bank accounts. The integrated banking sector's balance sheet shows the magnitude of the dollar deposit currency (Samreth and Okuda, 2019).<sup>119</sup>

The share of FCD in broad money remains the most widely used measure for determining the degree of dollarization in a country where foreign currency holdings in domestic and offshore accounts are less restricted (Rennhack & Nozaki, 2006b)<sup>120</sup>. According to NBC (2019a)<sup>121</sup> reveals that broad money (M2) increased 19.1 percent (year-on-year), and average growth over the last five years was around 21.4 percent which was in line with the economic growth. The growth was mainly due to the increase of foreign currency deposits at 16.4 percent, riel deposit at 37 percent, and the currency in circulation at 33 percent. Meanwhile, broad money growth boosted financial deepening (M2/GDP) to 96.4 percent, up from 96.2 percent the previous year (88.8 percent).

Figure 4.1: M2 Monetary Aggregate



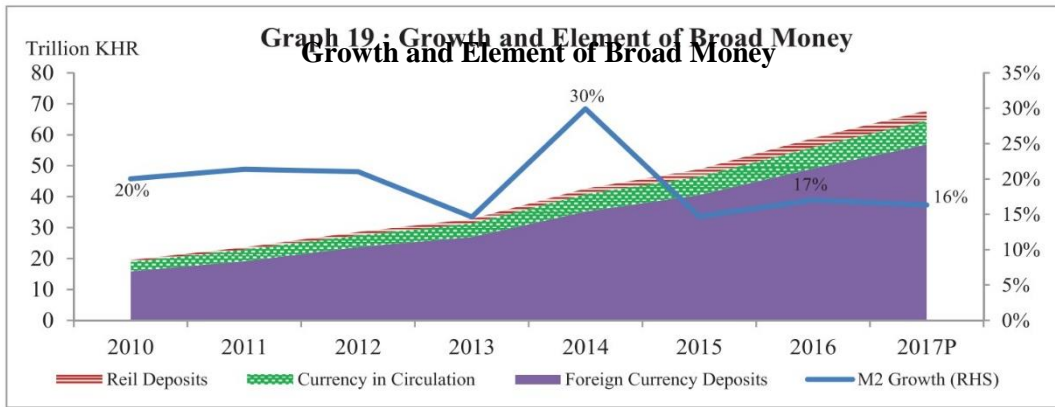


*Source: National Bank of Cambodia*

Similarly, if we look in figure 4.1 reports that foreign currency deposits represented 83% of broad money and have grown 21% y-o-y, stable since 2012. Home currency deposits, equivalent to 5% of broad money, grew 33% in 2016, and currency in circulation, which equaled 12% of

broad money, increased by 9% in 2016. The growth of riel deposits and cash in circulation could reflect the broader use of riel in the economic activity, essentially regarding payment and savings to NBC (2016:19)<sup>122</sup>.

*Figure 4.2: Growth and Element of Broad Money*

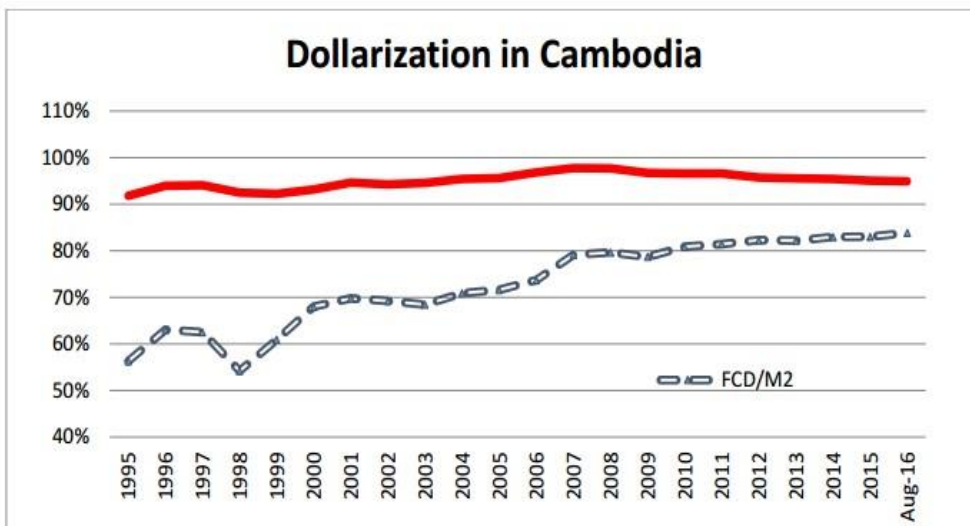


*Source: National Bank of Cambodia*

The degree of dollarization on the financial front is easily determined because banking data is tightly kept, strictly controlled, and the most reliable. Odajima and Khou (2016a)<sup>123</sup> highlight two common currency substitution indicators most central bankers, scholars, and researchers employ. The first measure is foreign currency deposits (FCD) in the domestic banking system in the broad money. The second is the share of domestic residents' foreign currency deposits at home and abroad in their total monetary assets. On the above two indicators, dollarization

in Cambodia has rapidly grown and remained high compared to other dollarized countries in the world. Figure 4.3 shows the trends of dollarization in Cambodia from 1995-2016. Specifically, FCD/M2 increased from just 36% in early 1993 to 68% in 2000 and reached 83.8% in 2020. Also, FCD/TD remained approximately 93.3% as of 2020 (NBC, 2020, p.15)<sup>124</sup>.

*Figure 4.3: Measurements of Dollarization Ratios in Cambodia*



*Source: National Bank of Cambodia*

In other words, Okuda (2017) analyzes the role of banks in dollarization in Vietnam, Laos, and Cambodia. The author finds that the expansion of foreign currency loans in those regions is fully financed by financial institutions' intermediation of domestic foreign currency funds. He also suggested that there were strong network externalities for the greenback in the dollarization because the unit of transaction and means of payment were also denominated in US dollar, which was distinct from the case of dollarization in Central and Eastern European Countries (CEECs). In CEECs, US dollar lending is driven by the large share of foreign currency funds in total funds, chiefly provided from overseas. Meanwhile, in a particular situation of Cambodia, banks collect foreign currency-denominated funds from residents because of the mean of payments and the unit of account deemed to dollarization, and widely hold foreign currency.

Despite this growing dollarization, it is worth mentioning that riels in circulation have been rising rapidly, around 31% per annum, and riel deposits have increased by 17% per annum. These increases display that US dollars do not substitute for riels but that the inflows of dollars somewhat enhance riel's role in the economy and the effect of network externalities that reduce the costs and convenience of using US dollars. The foreign direct investments, tourism receipts, remittances, exports, and other capital flows supported the influx of dollars in Cambodia's economy. These greenbacks have most been used directly in domestic transactions without being exchanged for the native currency.

More crucially, we measure the economic impact of financial dollarization using various indicators that illustrate the economy's real dollarization by taking into account the US dollars in circulation. One of these indicators is the sum of FCD and dollars in circulation over the broad money supply. In a cash-based economy like Cambodia's, it is impossible to calculate in practice because the quantity of dollars flowing in the economy is unknown. Informal economies make up a large part of this type of economy. However, the methods used to calculate the amount of money are suspect because they do not rely on any survey US dollars. For example, they are used for price quotations, payment and as a standard of deferred payment widely accepted throughout the country. Therefore, the amount of US dollars circulating outside the Cambodian financial system could be substantial (Menon, 2008a)<sup>125</sup>.

#### 4.3. Measuring US Dollars Circulating Outside Banks in Cambodia

Generally, dollarization was a response to economic instability and high inflation and the desire of domestic citizens to diversify their asset portfolios. While economic instability and enormous inflation were undoubtedly present in Cambodia in the early 1990s, these factors would not have been sufficient to induce such substantial dollarization had it not been for the unexpected and broad infusion of cash dollars in 1991-1993. Given a part of dollar inflows in physical cash, we believe the standard dollarization ratios contribute to underestimating Cambodia's real degree of dollarization. In economic analysis, this quality cannot be overlooked. Consequently, the author has difficulty objectively estimating the physical cash in dollars circulating in Cambodia.

In many developing countries, several of the decent quality data, especially data on national accounts. The author realizes that the data plays a prominent role in the outcomes, and we are aware that a changed dataset could lead to changes in levels. Nonetheless, the resultant physical cash dollar time series is unlikely to alter considerably. Hence, as in previous research, the author warns that the results should only regard as estimations. The goal is not to provide accurate cash dollar time estimations but rather a "baseline" for descriptive reasons that are used to compare policy options. According to the estimates, the dollars in circulation in early 1995 were around \$1.2 billion, and by early 2001, rising to \$2.9 billion.

The estimated stock of dollars in early 1995 seemed broadly consistent with the infusion of a large number of dollars since the mid-1980s, especially during the first national election prepared by UNTAC to purchase local services and goods, remittances, and private transfers from abroad, the repatriation of refugees with a crucial quantity of individuals and cash which also started in 1985. Between 1992 and 2000, the Council of Development for Cambodia (CDC) received around \$2.1 billion in bilateral aid.

As the political situation in the broader setting of the Asian Crisis deteriorated, cash dollars were expected to have steadied in 1997 and the first half of 1998. During this period, owing to political uncertainty, international aid inflows and foreign direct investment slowed, and the number of dollars circulating in the economy has stabilized around \$2.3 billion. After the second general elections in July 1998, a new surge in cash dollars was fueled by the

spectacular increase in FDI in the garment industry. From 1995 to 1998, about 165 garment factories opened, and they employed 160,000 staff who received, in aggregate, the estimated annual salary of \$140 million in cash, and today employees of garment and footwear factories approximately 923,000 as of 2019 (VOD, 2021)<sup>126</sup>. Assume that the proportion of estimated foreign currency in circulation is a share of the total money used to measure currency substitution (domestic and foreign currencies outside banks). In that instance, the average finding is around 96 percent. Several reasons can explain the high ratio of dollars in circulation to GDP and foreign currency deposits. First, people held dollars due to a lack of confidence in the domestic banking system and uncertainty about the future. Second, the lack of a modern payment system (electronic payments and credit cards) and the restricted usage of checks encourage the economy to rely on cash. Third, exceed cash in overly liquid banks, and a number of the decline to take small deposits. Fourth, there have no financial institutions outside the major cities, except some microfinance institutions. Fifth, it is conceivable that the large cash in dollars circulates in the economy due to smuggling and illegal activities, which typically transact in cash by using a primary international currency.

#### 4.4. Costs and Benefits of High Dollarization in Cambodia

A high degree of dollarization can yield both costs and benefits. And the following will examine how dollarization provides a positive and negative effect on Cambodia's economy.

##### 4.4.1. Drawbacks of high dollarization

In Phase 3 of its Rectangular Strategy (RS), the Cambodian government admitted that the economy remains fragile high dollarized, imposing limitations on monetary policy. Therefore, the RS opts for the continuation of a managed float exchange rate regime. Maintain the stability of the riel, which strengthens public and investor confidence in the home currency to enhance its greater use and reduce the high level of dollarization. The 2014-2018 National Strategic Development Plan (NSDP) of the RGC also called for greater control over the economy, particularly monetary policy, and concluded that de-dollarization should be the first step toward this. The main drawbacks of dollarization would describe below.

##### 4.4.1.1. Loss of seigniorage

If the authorities decide to dollarize the currency fully, they will face substantial seigniorage losses. A larger dollar money supply would involve an initial "purchase cost" and future annual seigniorage losses. To endorse the dollar as legal tender and withdraw the national currency entirely from circulation, the monetary authorities would have to purchase the stock of national currency held by the public and banks, effectively returning to the holder's seigniorage accumulated over time.

Fischer (1982) measures the initial purchase cost of full dollarization by expressing domestic currency in circulation as a percent of GDP. This would correspond to four percent of the estimated 2001 GDP in Cambodia's case; the cost would be \$139 million, or about one-third of net official reserves. According to Lim<sup>127</sup>, the US dollar in circulation to GDP was 2.2%,

1.6%, and 5.8% in 2015, 2016, and 2017.

According to Kang (2005) describes that there are three types of seigniorage losses (1) direct losses from renouncing the printing of a currency by allowing US dollars to circulate freely; (2) annual seigniorage loss due to an inability to conduct "inflation neutral" currency injection; and (3) forgone interest income by the central bank as a result of not being able to collect or lend the US dollar cash that is currently in circulation. To determine the amount of seigniorage loss, one would have to first quantity the unrecorded amount of US dollar cash in circulation, which is hard to estimate precisely. He anticipated the loss in seigniorage to be \$682 million at the end of 2004, with an additional \$61 million lost annually and annual loss amounting to around 2% of GDP; it was likely to be an underestimate in Cambodia because the number of foreign currency flows was unrecorded (Menon, 2008b)<sup>128</sup>. Stand on estimates of currency in circulation in comparator low-income countries in Asia, seigniorage loss for Cambodia could range from about 5–19 percent of GDP (Coorey and Husain, 2010)<sup>129</sup>. Referring to Khmer Times (2017)<sup>130</sup>, the cost of the loss of seigniorage is equivalent to about 10 percent of annual GDP; citing a study by the IMF, we can use this lost money to fund infrastructure and social development projects.

In contrast, the US Federal Reserve earned US\$289 billion in seigniorage between 1994 and 2010 (Kang, 2005)<sup>131</sup>. Once the riel currency rises in usage, the long-term growth of the country's economy could be a little tricky to figure out, but the local currency's benefits are worth it. For one

reason, the central bank could earn a seigniorage or revenues of nearly 95 percent from printing and issuing its notes, gains that can be used to manage the economy. Citing an example, Serey says NBC spends a printing cost of 50 riels to print a 10,000 riel note (Khmer Times, 2019)<sup>132</sup>. Cambodian people do not earn interest from money stock denominated in dollars. The net annual income forgone determined in the range of USD 20 to 90 million per year (IM et al., 2007b)<sup>133</sup>.

#### 4.4.1.2. Lower official international reserves

The other potential drawback associated with high dollarization in Cambodia stems from lower official international reserves. Agents who have foreign currency (e.g., exporters and foreign aid recipients) must acquire native money to conduct businesses in the presence of an adequate national currency. Part of the foreign currency sold to purchase home currency through the intermediaries mentioned above is likely to end up in the central bank's coffers, enhancing its international reserves.

In converse, those who would like to purchase foreign currency for their business abroad have to do it from the market. If a central bank refrains from supplying foreign currency to the exchange market, the foreign currency outflows from official reserves are deducted. Thereupon, the net international reserves of Cambodia have uninterruptedly increased since the 1990s. In 2018, the balance of payment surplus contributed to the increase of gross international reserve reaching \$18 billion, which ensured imported goods and services around seven months (NBC, 2019, p.8)<sup>134</sup>.

Nonetheless, we should highlight that official reserves do not serve the same purpose in a country with a sole domestic currency (i.e., building trust in the national currency and weathering temporary external shocks). In a high dollarized economy, the external credibility of the national currency is usually already essentially compromised. And since the US dollar acts as international reserves, the economic agents who hold a large number of dollars as the means to react to a temporary external shock. So, the main difference of reserves' status is the reserve in agents' hands rather than in the monetary authorities. The suggestion is that in an open economy like that of Cambodia, this is not necessarily undesirable - as far as minimizing output loss is concerned - because, in such an economy, the markets are the economic driving force.

Zamaróczy and Sa (2003)<sup>135</sup> recognize that if the current high levels of dollar inflows were to decrease and were no longer available to finance the current account deficit, the importance of reserves would grow.

#### 4.4.1.3. Loss of an effective monetary policy

The monetary authorities cannot directly affect the foreign currency component of broad money in a strongly dollarized economy. Agents' behavior holding foreign and local currency-denominated assets, including cash, determines the money supply in the economy, not the monetary authority.

As the money supply in the economy becomes endogenous, the authorities may not be able to fight inflation by tightening the domestic money supply appropriately. As a result of Cambodia's high dollarization, the National Bank's monetary policy is limited in its effectiveness. Its operations in riels have little impact on overall monetary developments, and similarly the case of Uruguay (Menon, 2008c)<sup>136</sup>.

While monetary authorities cannot directly influence the money supply in a strongly dollarized economy, they can regulate other crucial factors such as base money and the reserve requirement ratio. In theory, the monetary policy tools should indirectly allow the central banks to control the domestic money supply. However, in Cambodia's case, as financial intermediation is inhabited and conducted almost entirely in foreign currency, the National Bank's ability to control base money is defined. Changes in required reserves are still a viable tool for the NBC, but for the sake of financial stability, this regulatory tool was employed frequently. The NBC had only changed the reserve requirement once since December 1993, when it raised from 5% to 8% in January 1998. Also, NBC introduced a refinancing facility as another possible monetary tool in June 1994. The trade bills denominated in riels are the only asset eligible for this facility rate. This instrument allows the lender can redeem the bills before maturity at a discount of 70% of face value. However, The commercial bank has never used this facility.

In terms of interest rate policy, commercial banks are free to determine their deposit and lending rates. Because the NBC does not refinance banks, it has little control over interest rates and is unable to employ interest rate policy as a monetary tool (De & Sa, 2002b)<sup>137</sup>. The central bank can not use its currency to plateau on price and economy fully.

When the government wants to print money, it will not increase much in the economy due to transactions done by the dollar. The government cannot control the interest rate since most deposits are in the dollar, not riel.

#### 4.4.1.4. Loss of an effective exchange-rate policy

The high dollarization of the economy means that the exchange rate policy is becoming less flexible, making it more challenging to adjust the exchange rate in reaction to external shocks. In the event of an external shock, the highly dollarized economies tend to adjust through the goods and factors market, with the help of financial markets, if there are enough well-developed. Between 1994 to 1999, NBC pursued a flexible exchange rate policy, keeping the spread between the official and the market rates below one percent, except in a few exceptional periods. Since late 1999, the central bank has further kept the spread at only  $\frac{1}{2}$  of 1 percent, and it intends to eliminate the spread (Odajima & Khou, 2016b)<sup>138</sup>.

Since the national bank of Cambodia cannot employ most monetary and exchange rate instruments, it lacks the tools to conduct those policies effectively. Therefore, in Cambodia, the brunt of macroeconomic adjustment falls on fiscal policy (BOK, 2016)<sup>139</sup>.

#### 4.4.1.5. Loss of the lender of last resort

The lender of last resort is an institution lending at reasonable low-interest rates to private or public sectors with serious credit constraints. Generally, the central bank implements this role. Additionally, the national or central bank grants liquidity insurance to the banking system, which administers liquidity insurance to the rest of the economy, fundamentally licensed financial institutions as well as households and businesses. So, central banks are liquidity reinsurers.

The NBC lacks a tool to affect monetary aggregates and anchor inflation expectations in the private sector. NBC has little control over credit movements in the private sector. The extent of dollarization forces NBC to delegate its monetary policy to the United States. While NBC uses the dollar Reserve Requirement Ratio (RRR) as a monetary policy tool to control liquidity from time to time, its effectiveness has proven limited. In early 2009, when the RRR was reduced to provide more liquidity to commercial banks and help boost the economic activity in the wake of

the global financial crisis, banks instead accumulated more reserves at the central bank. The excess reserves rose to their highest levels in history, and credit to the private sector contracted.

Furthermore, NBC does not print US dollar bills, and its foreign currency reserves are not available for use freely as it keeps up the riel's stability. If we lend US dollars to banks, there is a risk they might not be able to pay back. Any lending to banks, although solvent and with collateral, is still a risk. National Bank won't lend what they cannot print. Tucker (2019)<sup>140</sup> states the central bank pursues as a liquidity re-insurer. As a general matter, it does not grant liquidity insurance directly to everyone in the economy but rather to the private sector liquidity insurance, the banks.

Ultimately, dollarization steers to loss of an adjustment mechanism, surrendering of the lender of last resort, and loss of seignorage revenue. Moreover, the more critical adverse effects of dollarization are political, not economic, involving losses of a powerful symbol of national identity, an emergency source of government revenue, and a crucial measure of diplomatic insulation.

#### 4.4.2. Benefits of high dollarization

##### 4.4.2.1. Isolation from the effects of exchange rate fluctuations

Highly dollarization awards some protection against exchange rate risks. A fluctuation in the exchange rate backs only on a small part of the money supply, such as domestic and financial assets. In dollarized economy, the bulk of trade-related and extensive financial transactions are settled in the dollar. Alternatively, the home currency is chiefly used for dealing with smallscale non-tradable. Resultantly, in an exchange rate devaluation/depreciation, the pass-through effect of higher import price on inflation is limited, and prices of non-tradable settled in local currency are not directly affected. The Asian crisis dramatically illustrated this isolation effect.

The Thai baht declined 59.80 percent versus the dollar from July 1997 to September 1998 (Sumner, 2005, p.1)<sup>141</sup>.

The exchange rate of KHR riel versus the dollar has remained largely stable since 1999, while both currencies have struggled against the Thai baht and the Vietnamese dong. The United States is Cambodia's primary export market, whereas Thailand and Vietnam are the primary sources of Cambodian imports. The recent appreciation of



the KHR riel benefits Cambodia by improving trading terms. These evolutions could also explain the low inflation in Cambodia since the end of 1999. The real effective exchange rate has increased regularly - except for the turbulence in 1998 - by 15 percent since early 1995. Still, this increase seems not to have hurt Cambodia's exports, presumably due to the garment industry's external market's particular nature.

When the value of the riel compared to the dollar deteriorates in a strongly dollarized country like Cambodia, the National Bank of Cambodia will sell the dollar and absorb the riel back from the market so the value of riel will remain stable. Therefore, to intervene in the foreign exchange market, the national bank must accumulate appropriate international reserves to support public confidence in implementing its policies. Furthermore, international reserves work to prevent risks such as the volatility of the current account and economic depression. For example, when natural disasters like flooding or volcano interrupt the production process to export, foreign currency supply in the payment of imported goods will also have an obstacle. To solve these problems atop, the forex reserve will be used temporarily to pay for the imported goods. Additionally, foreign reserves also reduce the negative effect and increase foreign investor confidence when capital outflow immediately (NBC Bulletin 51, 2017, p.32-33)<sup>142</sup>.

#### 4.4.2.2. Financial re-intermediation

Dollarization or Euroisation can foster macroeconomic stability by resolving the trustworthiness problem that arises when a domestic central bank cannot pre-commit itself to consent to a low inflation rate. The progressive financial deepening of Cambodia's banking system has been another benefit of dollarization. In economies that have experienced an unstable macroeconomic situation and high inflation, local residents tend to become hesitant to keep deposits in the domestic banking system

Because of foreign currency deposits held in local commercial banks, dollarization enhances agents to use bank service rather than hold idle cash balances. When the macroeconomic is recovered to a stable situation in a dollarized environment, agents may have more trust in the banking system. They may be more willing to return to domestic intermediaries if they can occupy dollar-denominated assets.

AIB and LAM (2019)<sup>143</sup> write financial institutions actively promote dollarization in response to the growing share of foreign currency in their liabilities. One of the rationales for financial institutions to lend in foreign currency is to hedge against currency mismatches. Financial institutions contribute to passing the currency mismatch risks onto their borrowers by lending in a foreign currency.

#### 4.4.2.3. Economic and financial integration

The dollarization may participate in greater economic and financial integration with the rest of the world. Foreign currency usage, especially the US dollar, the most widely used currency in international trade, reduces the transaction costs of purchasing other global currencies.

The more trade and financial flows are integrated with countries using the dollar, the more significant the reduction of exchange risk. Nevertheless, exchange risks with other currency zones remain. Mundell (1961) analyzes optional currency areas and provides a good analysis of trade benefits connected with dollarization. The benefits of increased commercial integration can outweigh the drawbacks of dollarization and loss of seigniorage (Edward, 2001)<sup>144</sup>. With a high level of dollarization, Cambodia stands to profit from increased trade (Zamaroczy and Sa, 2002c).<sup>145</sup> Chile's hazards or exposure to currency fluctuations is also likely to reduce as it becomes better hedged and financially more integrated with the rest of the world.

The share of garment exports in Cambodia's total exports surged from 61 to 83 percent between 1995 and 2001. Since 1998, the United States has become Cambodia's primary market for garment exports, contributing to 71% of total exports. During 2014-2016 garment export and footwear grew steadily recently with an annual growth rate of 10.8% per year, with 7.97 billion in 2019. Cambodia became the top ten of largest garment export countries in the world (CDC, 2019)<sup>146</sup>. Other factors, such as the export license system of the United States, have undoubtedly contributed to the expansion, but dollarization has also played a role. It will almost certainly be crucial in the future diversification of exports. On the other hand, dollarization limits price/wage flexibility and requires sufficient productivity gains in the export industry to stay competitive.

Similarly, dollarization promises macroeconomic stability for foreign investors and removes the domestic exchange

rate risk, exclusively concerned with profits repatriation. Dollarization also reduces a country's vulnerability to currency crisis and contagion, as Cambodia experienced in 1997-1998. Dollarization has the potential to promote the growth of domestic financial markets in the medium term. Due to lower costs of international financial transactions, the use of dollars helps incorporate the local market into the rest of the globe.

#### 4.4.2.4. Fiscal restraint

Fiscal discipline or restraint is crucial to sustaining price and exchange-rate stability, as observed in dollarized economies and underlined in Cambodia's case. Dollarisation intends to improve a country's fiscal discipline by removing the possibility of printing money to finance budgetary deficits (Winkler, A. et al., 2004)<sup>147</sup>.

However, much of the deficits are paid by donor funding and concessional loans, trending downwards in recent years. Most independent central banks can avoid unsuitable financing of budget deficits through money printing since such financing is inflationary and likely to cause even more significant deficits. When monetization of the deficit is hindered, a fiscal discipline will likely result in a strongly dollarized economy where the reserve bank cannot emit dollars, lest they deplete their services. By removing the seigniorage as a source of easy revenue, will also induce to limit fiscal policy.

The empirical results of Karras (2002)<sup>148</sup> show that the anticipated costs and benefits vary extensively across the sample countries (annual data from the 1950-1997 period covering 18 nations in North, Central, and South America, including the United States). Those are strongly positively related: countries that believe to benefit the most from dollarization in case of price stability favor to be also the countries for which the compensation costs of delegating monetary policy to the United States will be superlative. On the other hand, Peru has a lot to gain from dollarizing and has a lot of loss from it, whereas Canada has little to lose by dollarizing and has little to gain from it.

Finally, we can summarize the advantages of dollarization. Dollarization drives macroeconomic stability, strengthens

the nation's fiscal discipline, enhances access to financial markets, accommodates lower inflation, develops the financial sector, inspires stable economic growth, and encourages economic integration.

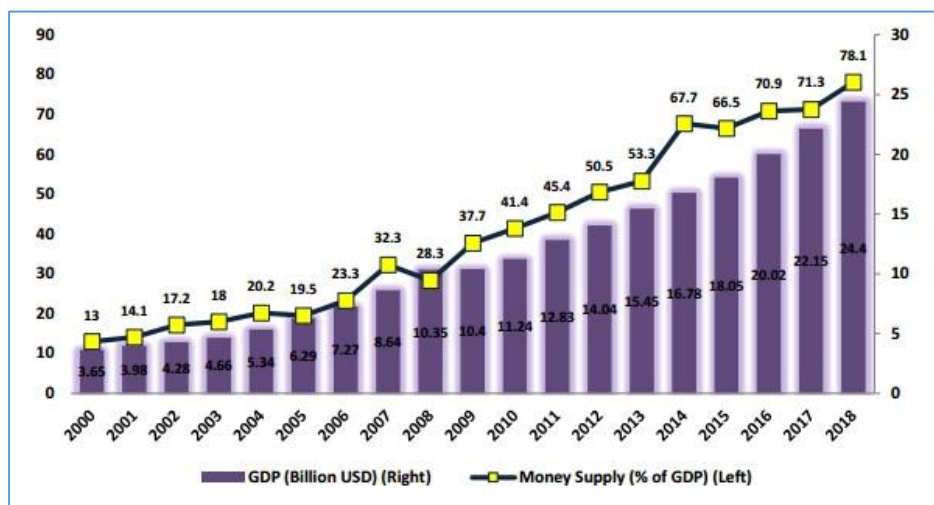
#### 4.5. Monetary Policy and Constraints of Implementation

Dollarization has its roots in many of these circumstances, not so much in market failures as in policy failures, to the extent that legislation does not address evident imperfections. Creditors often internalize the underlying credit risk when deposits are guaranteed, or bankruptcy of private banks or companies are bailed out. They stand to lose a lot in the event of default - that is, unless they have enough equity at stake- they transact in the currency that maximizes the implicit option value of the guarantee.

Monetary policy has effectively maintained low inflation and kept the Cambodian Riel broadly stable against the US dollar. Progress on increasing riel usage has been slow despite NBC's efforts, including improvements in market operations such as increased use of the LiquidityProviding Collateralized Operations (LPCO). Also, the publication of the first Financial Stability Review (FSR) in 2019 is a welcome step to promote macro-prudential policy decisions' effectiveness and transparency. The NBC continues to implement regulations to boost liquidity and solvency positions and improve loan classification and provisioning (IMF, 2019)<sup>149</sup>.

Monetary policy is conducted by each nation's central bank and plays an essential role in supporting economic growth. Additionally, NBC acts as a necessary principal agent to manage Cambodia's financial sector, such as microfinance, commercial banks, and other financial institutions to assure financial stability. NBC virtually implements monetary policy by managing the money supply in the context of a highly dollarized economy. As presented in the annual report (NBC Annual Report, 2018a),<sup>150</sup> Cambodia has remarkably achieved a GDP growth of around 7% for the last two decades and figure 4.4 indicates the data of money supply and GDP movement from 2000 to 2018. The money supply increased surprisingly from 13% to 78.1%, with a GDP of 3.65 to 24.4 billion USD in 2000 and 2018.

*Figure 4.4: Money Supply and GDP in Cambodia*



Source: National Bank of Cambodia

Under the prime objective of keeping price stability, the central bank has three principal policy instruments: the reserve requirement ratio, foreign exchange intervention, and OMO through instruments such as overdraft, negotiable certificates of deposit, liquidity-providing collateralized operations, and marginal lending facilities.

#### 4.5.1. Foreign Exchange Intervention Policy

A central bank expands or contracts its base money supply to affect macroeconomic variables and ultimately achieve its desired goals, including attaining inflation targets, economic growth, and employment creation. Also, monetary policy affects exports and imports through the exchange rate channel. It shapes people’s expectations over future inflation and growth prospects and affects asset prices through interest rate fluctuations.

Exchange rate system of Cambodia has both an official rate and a market rate since 1993. From 1995, the National Bank of Cambodia has adjusted the official exchange rate daily, keeping the difference between official and market rates below 1%. In 1993, the riel suffered a significant depreciation due to a managed floating exchange rate switch. Another material depreciation happened in 1998 when the riel lost 27 percent of its value because of the rising inflation. But after 1999, the nominal exchange rate has been remarkably constant.

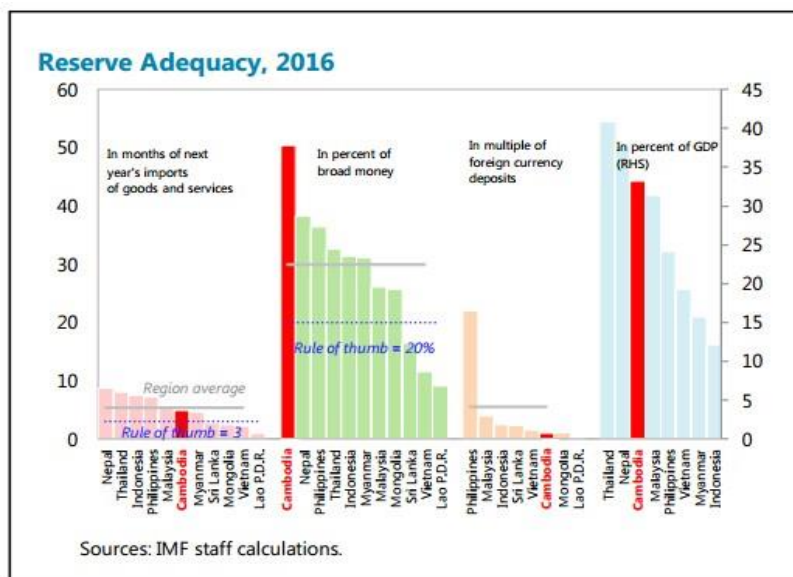
The current exchange rate regime is based on keeping the riel broadly stable against the US dollar and is appropriate

for Cambodia given high dollarization and a concentration in US dollar-invoiced exports. Over the last seven years, Cambodia has been consistently accumulating reserve assets, and measured against several traditional metrics, gross reserve assets of Cambodia appear to be adequate. The surplus of the balance of payment goes on to accrue gross international reserve reach 20.8 billion US dollars, which assures importing goods and services around ten months higher than the minimum level for developing countries that should have the 3-month guarantee of imports (XINHUA NET, 2020)<sup>151</sup>.

Given the long-term nature of the external debt of Cambodia, the third traditional metric – reserves in percent of short-term debt – is not as relevant. However, the gross foreign reserve to the GDP ratio was 76.2 percent, and the reserve to the foreign currency deposit ratio was 75.5 percent (FSR, 2020)<sup>152</sup>, limiting the central bank’s lender of last resort capacity and is below regional comparators. Continued financial deepening in the context of near-full dollarization, foreign currency deposits are likely to pursue to grow as of mid-2021, reveal foreign currency deposit compared to total deposit reached 92.5%, and foreign currency loan to entire loan was 87% (NBC, 2021a)<sup>153</sup>. This suggests that further accumulation of reserves beyond the level indicated by traditional reserve adequacy metrics, along with measures encouraging the use of the riel, is necessary to enhance resilience against financial sector vulnerabilities and rapid capital flow reversals. Figure 4.5 exhibits the level of international reserve held by NBC compared with Nepal, Thailand, Indonesia, Philippines, Malaysia, Myanmar, Sri Lanka, Mongolia, Vietnam, and Lao P.D.R.



Figure 4.5: Cambodian International Reserves



Source: National Bank of Cambodia

Cambodia is heavily dollarized in terms of FDC/M2 or other financial industry data. According to the National Bank of Cambodia's survey conducted in 2014-2015, salary/wage income has the highest foreign to local currency ratio, with a mean value of 38.3 percent, while company owners and agricultural activities use approximately 16.9 percent and 5.0 percent, respectively. Therefore, salary or wage income is one of the crucial drivers for income dollarization.

According to the data, those employed in the garment/shoe manufacturing and finance sectors had the most fantastic express figure of dollarization at 87.5 percent and second-highest at 62.2 percent. The findings revealed that foreign currencies are frequently used in Cambodia in general, although the extent of use varies greatly depending on the items (Odajima and Khou, 2017c)<sup>154</sup>.

Generally speaking, people used the riel for food and beverage, alcohol and tobacco, water and electricity, and health, including toiletries. However, for house rent, communication, furniture and appliances, real estate, and related services are transacted in dollars. In contrast, riel is used frequently for daily and small transactions. There seems to be an enlargement of arguments in favor of the floating exchange rate over the fixed regime. The

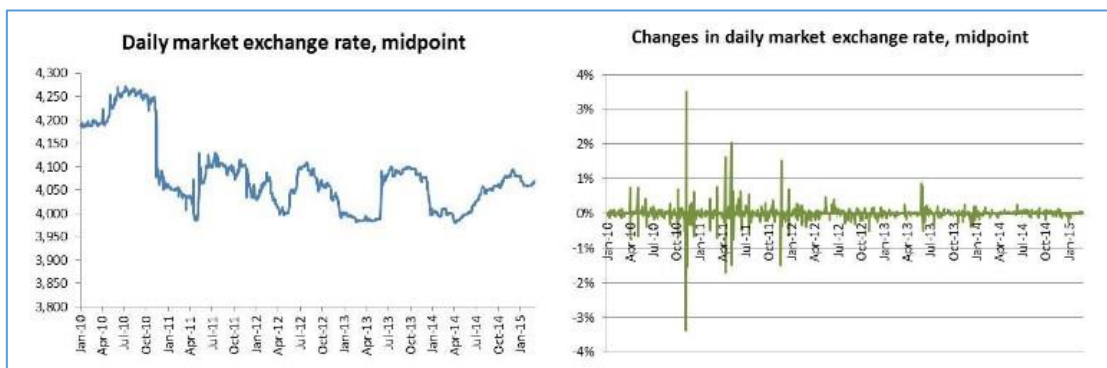
suggestions of using the floating exchange rate are strongly recommended for both developed and developing economies, and there are three reasons for that. The *first* reason is that it is very costly for the government or central bank to maintain a fixed exchange rate. An excellent example is the Bank of England is a scandal to have taken more than a \$5 billion capital loss within a few hours in its unsuccessful attempt to prevent the pound's failure in September 1992. Many other European Central banks hurt similar fates in 1992–1993. Mexico disbursed \$25 billion in reserves and borrowed \$25 billion more to guard the peso's dollar peg in 1994, painting enormous losses when the peso collapsed at year-end (Obstfeld and Rogoff, 1995)<sup>155</sup>. *Secondly*, even if some governments could fix the exchange rate, they couldn't do it for long. Most countries trying to fix exchange rates to stabilize their macro-economy during the financial crisis couldn't do it for years. They allowed it to float at some point because the government and its mid-back were running out of resources to keep the rate fixed. *Thirdly*, the world trading volume of the exchange rate market is too big for any country to defend against any speculative attacks. The world exchange rate was traded at 3 trillion per day, which is higher than the total economic size of the UK US\$2.9 trillion; France US\$2.5 trillion; India US\$2.3 trillion; Brazil US\$2.9 trillion, Italy US\$1.8 trillion, Canada US\$1.6 trillion. The volume of the world exchange

rate trading is only lower than the three top biggest economies in the world: US US\$18.1 trillion, China US\$11.2 trillion, and Japan US\$4.2 trillion (Samsen, 2015)<sup>156</sup>.

Luis Palacios-Salguero (2008)<sup>157</sup> conducted an empirical analysis to test the special floating exchange rate over the fixed exchange rate and found that the floating exchange rate is the best policy in providing more significant benefits to the domestic economy than that of the fixed exchange rate. In the case of Cambodia, the “managed floating exchange rate regime” the NBC adopted is appropriate. Given the depth and integration of Cambodia's financial sector into worldwide financial market systems, NBC allows the currency rate to float more freely. The appropriation of riel for the next 5-10 years would boost riel's confidence, resulting in increased use of riel for transactions and value storage, potentially replacing the US dollar.

Because the interbank market is also underdeveloped, NBC must deal directly with money changers through auctions for Khmer Riel. In 2018, the national bank purchased USD 875 million from commercial banks and money changers (Figure 4.6). The volume of foreign exchange transactions with banks declined in 2018 from 2017 because banks could obtain riel from the NBC through various channels like the liquidity-providing collateralized operation.

Figure 4.6: Daily Exchange Rates and their Movement

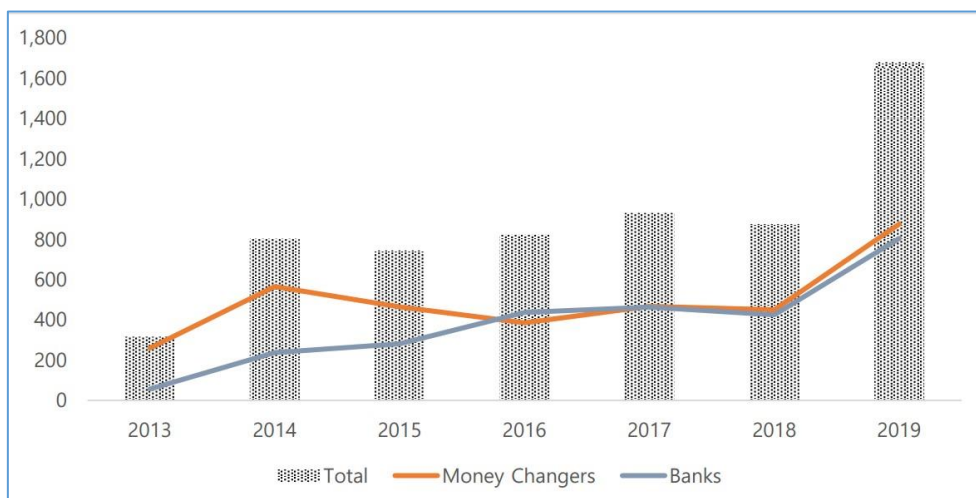


Source: National Bank of Cambodia

Indeed, exchange rate policy is vital in a small and open economy, especially in a dollarized economy. Fighting inflation requires the nominal exchange rate to appreciate relative to the real effective exchange rate. Slightly, appreciating currencies will also help to dampen inflation pressures by lowering import costs. Cambodia has adopted a managed floating exchange rate regime favoring the central bank's gradual accumulation of international

reserves. Within a dollarized economy, NBC uses interventions in the foreign exchange market as an indirect monetary policy tool. Through this intervention, NBC manages the stability of the exchange rate. The tight monetary policy accompanied by NBC and strict fiscal discipline adhered to by the RGC has resulted in a low inflation environment and a stable exchange rate.

Figure 4.7: Buying and selling in foreign exchange market (Million USD)



Source: National Bank of Cambodia

To stabilize the exchange rate and offset temporary disruptive capital inflows and outflows. For example, in riel depreciation, NBC would auction US dollars from its international reserves and this intervention is only aimed at relieving temporary pressure on the riel. It is not the policy for NBC to intervene if the riel depreciation occurs due to structural imbalances. NBC's purchase of riels has two effects. First, it scales down NBC's holding of international reserves. Second, the national currency in circulation will fall. This decline in the monetary base would remove the pressure on the riel to depreciate. In the case of dollar depreciation, NBC would purchase the US dollars (sell the national currency) in the foreign exchange market, resulting in expanding the monetary base and accumulating international reserves.

Regarding the effectiveness of interventions in meeting different objectives, 12 out of 16 central banks that intervene to calm disorderly markets viewed their interventions as most effective. Also, four viewed it as sometimes effective. Among those that viewed this type of intervention as effective, two out of six (Hong Kong and Malaysia) operate - not surprisingly - a fixed exchange rate regime. Several studies in the context of industrial countries have found evidence that foreign exchange intervention might be more effective in influencing the exchange rate at a shorter time horizon (e.g., over two to three days or one week) than at a longer horizon (Hawkin and Mihaljek, 2001)<sup>158</sup>.

Cambodian National Bank's exchange rate strategies are one of the powerful monetary instruments. The NBC

determines the official exchange rate by the NBC Official Exchange Rate Decision Committee (OERDC) comprises officers from important subdivisions, such as banking, issuance, foreign exchange board, the international cooperation department, as well as statistics and economic inquiries.

Foreign exchange auctions were introduced in September 1993. From then until April 2005, importers, money changers in the parallel foreign exchange market, and commercial banks engaged actively in the auctions. However, starting in May 2005, all dollar auctions were conducted solely by NBC because it could better manage the supply of dollars in the economy. NBC has built a track record for maintaining the exchange rate at a level that contributes to price stability.

NBC intervenes in the domestic FX market to keep the stability of the domestic currency exchange rate. In 2008, NBC purchased USD 261.18 million from money changers in exchange for 1,043 billion riels. Moreover, it auctioned off USD 9.1 million in the market and sold USD

89.5 million to the Cambodian Electricity Company (EDC) to absorb Cambodia riels. As stated in the annual report (NBC 2019c)<sup>159</sup> exchange rate of riel currency against the US dollar remained stable at an average of around 4,055 riels per US dollar, compared to 4,051 previous year. In the first semester of 2021, NBC intervened in the foreign exchange market to stabilize the foreign exchange rate base on fluctuating economic base. Net US dollar selling amount USD 48.5 million compared to USD 146 million same periodic previous years (NBC, 2021b)<sup>160</sup>.

In other words, foreign exchange policy might not reduce dollarization despite the country's economy staying stable for many years.

- First, Cambodia lacks an effective wholesale market for foreign exchange that is not cash-based and deals in small retail transactions. The interbank market featuring foreign currency deals among banks persists underdeveloped.
- Second, too many money changers hinder fiscal policy toward stimulating the use of the national currency. Excluding those unregistered, almost 3,000 licensed and authorized money changers were in Cambodia as of December 2019. Money changers of all types are often located in highly populated areas, making it convenient for those needing to exchange currency. Therefore, people have no incentive to hold their home currency because they can easily convert USD into KHR without waiting or traveling far. In most cases, civilians, as well as tourists, can make payments in the US dollar. Furthermore, the stable nominal exchange rate allows them to carry more greenbacks without fearing exchange rate risk.
- Third, the system of a managed floating exchange rate can apply pressure to foreign exchange reserves. In a heavily dollarized economy like Cambodia, one argument says such reserves should be increased to guard against exchange rate volatility. And as pointed out by Lay et al. (2012)<sup>161</sup> empirically tested the relationship between dollarization and exchange rate volatility in Cambodia and found that dollarization causes riel depreciation and well as intensified rate variability.

- Fourth, the foreign exchange market is exposed to speculative attacks because of the country's fixed exchange rate. As speculators know that a central bank is committed to keeping its currency's value at a set level, they can foresee moves on the market. Yet, in a highly dollarized economy such as Cambodia, severe currency mismatches and maturity do not occur, lowering the threat of speculative attacks. Cambodia's managed floating exchange rate has played a crucial role in building investor confidence in a risk-free rate. Over the last 20 years, clear evidence shows how a stable KHR-USD rate and inflation have stabilized the Cambodian macroeconomy.
- Finally, exchange rate volatility could affect the purchasing power of both KHR and USD holders because the majority of goods and services in Cambodia have their prices quoted in US dollars (BOK, 2020)<sup>162</sup>.

#### 4.5.2. Reserve requirements

Essentially, the reserve requirement has fulfilled at least three objectives: the first is to reduce the bank liquidity and solvency risk, the second is to affect market rates and monetary aggregates, and the third is to manage system-wide liquidity. Foreign currency reserve requirements can play a valuable role as automatic liquidity stabilizers (Baliño, Bennett, and Borensztein, 1999)<sup>163</sup>. We can use the required reserve on foreign currency deposits to tax banks and discourage capital inflows. In general, reserve requirements can be used as a means of sterilizing excess liquidity. For example, a reduction in the required reserve decreases the number of reserves that banks must hold, and therefore banks can make more loans. The larger volume of loans adds to the money supply and stimulates the economy.

On the other hand, the separation of required reserve usage could have severe consequences for the financial system. Reserve requirements that aren't compensated are

akin to a levy on the financial system, leading to financial disintermediation. As a result, the central bank employs reserve requirements to control banks to ensure the banking system's security and stability in a dollarized economy.

The required reserve system, which financial institutions must hold at a specific ratio of their liabilities in their accounts with the central bank, so allows the central bank to adjust the liquidity in the markets and promotes financial strength to meet its goal by changing the funding situation of financial institutions.

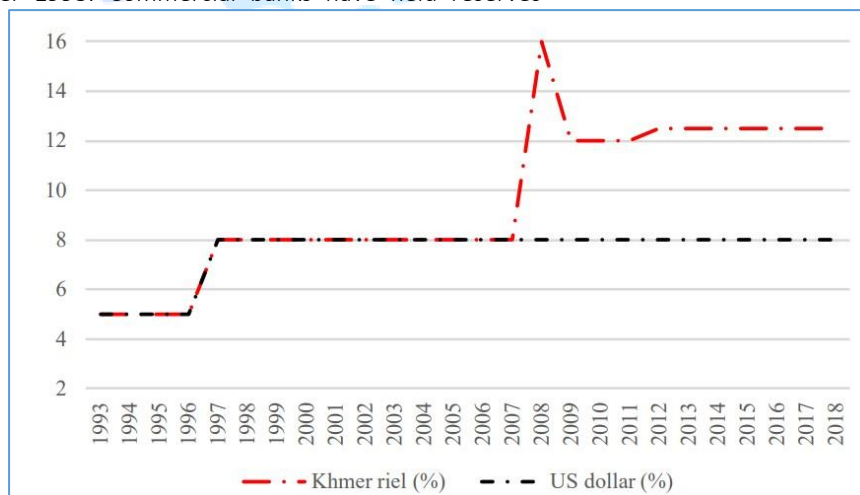
For instance, raising the reserve requirement ratios cause banks to deposit more money as their required reserves. Their capacity to provide loans and purchase securities is declines, leading to a decrease in the volume of money in circulation. Consequently, this will reduce liquidity and avoid the possibility of financial unrest arising from an excessive increase in lending.

Specifically, the required reserve has been applied at a uniform rate of 5 percent on all deposits introduced in December 1993. Commercial banks have held reserves

primarily in dollars in line with the composition of their deposit liabilities.

Figure 4.8 shows the movement of required reserves implemented by Cambodia's national bank from 1993-2008. Notably, commercial banks productively grew their lending portfolios in 2007 and 2008, was fuelling property investment and devoting to a home-grown real estate boom in Cambodia. The NBC imposed restrictions on real estate lending by highering reserve requirements and limiting real estate to help interrupt real estate prices and control inflation. In May 2008, NBC was cautious of the temperating reality of sharply rising inflation and its damaging impact on the economy, doubling the required reserves to 16 percent. Honestly, the required reserve is one of the few instruments applicable to NBC in managing monetary policy in this dollarized economy. It permits the national bank to dominate the amount of liquidity in the banking system.

Figure 4.8: Reserve Requirement, 1993-2018



Source: National Bank of Cambodia

Recently, with the goal of reducing the economic impact of COVID-19 and according to the government's policy, the NBC has declined the rate on reserve requirement from 8 percent for domestic currency and 12.5% for foreign currency to 7 percent for both local and foreign currency starting from April 2020 until new regulation has been replaced (NBC Announcement, 2020).<sup>164</sup> With the required reserve reduction, financial institutions will have more liquidity of around \$1.8 billion to inject into

the Kingdom's economic activities to adjust with government policy.

Raising reserve requirements would increase commercial banks' expenses while having little effect on the loan volume or liquidity of the banking system, which is driven mainly by demand. In addition, dollar inflows into the country are probably to continue, and interest rates on the domestic market are greater than those on the international market make the country's macroeconomic

conditions are stable, or there are appealing investment prospects (Glocker and Towbin, 2012)<sup>165</sup>.

The Central Bank of Cambodia uses this instrument to affect loan activity, indirectly influencing the economy's money supply. Aside from that, the change in the required reserve policy may involve the deposit maturity structure. According to Barro (1990), changes in stock market turnover significantly impact investment and lending activity growth. The rate of broadening in the reserve requirement has a detrimental influence on loan growth. We can accept the notion that a 1% increase in FDI results in a 0.5 percent rise in loans. However, according to the rule of thumb in Montenegro, the ideal rate is between 8% and 10% (Milošević 2014)<sup>166</sup>.

Positively, we recognize that the main goal of reserve requirements varies markedly across countries and time and determining the primary goal is not always straightforward. Central Bank of Malaysia recently stated that modifications in reserve requirements are only to guarantee financial stability. In addition, FX reserve requirements do not seem to have an impact on exchange rate deviation from long-term trends of 3 or 5 years (de Crescenzo A. et al., 2021)<sup>167</sup>.

#### 4.5.3. Discount lending

The discount window of the NBC provides a safety gate for relieving reserve requirement pressure. By lending funds against acceptable collateral, the national bank provides liquidity to financial institutions while ensuring the healthy stability of the banking system.

Monetary policy during 2003-2008 has been successful in achieving relative price stability through a carefully managed growth of money supply, particularly curb on government credit from the banking sector and by maintaining a satisfactory level of net foreign assets. Monetary policy should aim at (1) more active management of liquid assets; (2) better conditions for bank intermediation and private sector financing; and (3) an exchange rate policy determined by market conditions. The lender of last resort activity is traditional for a central bank. Typical, It acknowledged that solvent but illiquid banks should have access to a central bank's discount window to obtain the funds necessary to remain in operation. The last resort lender' policy intends to assure that liquidity shortage does not guide to trouble in the payments system. Naturally, the national bank's

discount window activity would not be available under official dollarization. NBC would hinder from issuing reserves to grant banks with these extra funds (Naron, 2011a)<sup>168</sup>.

Referring to Russell Shor (2020),<sup>169</sup> concerned that obtaining loans from the discount window for concise periods seems relatively harmless, banks in the US historically have been reluctant to borrow from it because of the "stigma" attached to doing so. The Fed promoted lending through the discount window to liberalize its policies in the run-up. Also, promptly after the dot-com bubble in 2000, terrorist assault in 2001, the global economic dilemma in 2008, and coronavirus pandemic in 2020, among other times of market stress and liquidity constraints.

Notably, the Prakas No B-5-010-183 Prokor on the publication of tradable securities by the NBC dated 15/October/2010 has indicated the transaction associated with the repurchase agreement implemented in Cambodia as the beloved.

- Under conditions determined by Prakas to be issued by the NBC, the securities occurrence will be eligible to the secured overnight facilities to provide the market participants with some flexibility to cover their negative clearing balances. Such overnight facilities shall not be considered a regular funding source by clearing members and shall be granted at a penalty rate published by NBC.
- Overnight facilities shall be secured by an equivalent or higher nominal amount in securities regularly owned by the clearing participant. The ownership of collateral transfer will be performed after confirmation of such facilities to the beneficiaries and the NBC initiative. The remuneration of the securities will also be performed the next day at NBC's initiative after reconstituting a positive cash balance on the clearing account.



- For temporary and short-term liquidity needs, the securities held by market participants will be eligible for the liquidity window. Such transactions shall be pre-approval by the NBC for periods ranging between two working days and two weeks. Access to the discount window shall not substitute for overdraft facilities that are different. The adequate availability of eligible securities will condition approach to the national bank discount operations. The list of eligible securities for the discount will be updated and published by national bank and the applicable discount rates.
- The transactions executed within the discount windows shall be advocated by a Repo Master Agreement (RMA) signature between NBC and its beneficiary. The design and approval upon securities will transfer at the driver of NBC at both initiation and maturity of the transactions.

Any other way, NBC introduced a facility of refinancing window in 1994 to satisfy the need for short-term liquidity of commercial banks. The most favorable asset for this facility is a tradable bill denominated in riel since the government securities have not yet been issued. The lender can repurchase the facility before the maturity date at 70% of face value. However, private banks have utilized it since most banks receive deposits and give loans in overseas currencies, which interrupt the function of NBC as a last resort lender. Up to now, only a few microfinance institutions have been engaged in this operation. A discount rate of 6% per annum is applied to this facility (Nidhiprabha, 2013, p.43)<sup>170</sup>.

#### 4.5.4. Open-Market Operation

The Bank of Slovenije (2021)<sup>171</sup> commonly engages open market operations to supervise the required liquidity and signal money-market interest rates. There are five types

of instruments to conduct the open market operation in Eurosystem.

- The reverse transaction is in the sort of collateralized loans or repo transactions
- An outright transaction where the reserve bank purchase or sells financial assets usually outright securities
- Issuance of central bank debt certificates
- Foreign Exchange Swaps
- Collection of fixed-term deposits from banks

The most typical method for the central bank to expand or decrease the outstanding supply of bank reserves is through an open market operation, which involves the monetary authority buying or selling securities (generally government's securities) on the open market. When Reserve Bank purchases securities, the payments will increase the seller's reserve account. Consequently will boost the total reserve holdings of financial system. When a reserve bank sells securities, it receives payment by deducting funds from the buyer's bank reserve account. As a consequence, the entire volume of reserves is reduced. Although private-sector banks regularly trade current reserves, no bank or other market participant has the authority to increase or decrease from the overall level of reserves. The reserve bank has a monopoly on reserve supply to the entire banking system.

In this way, expanding or shrinking the total volume of reserves matters because the banks can trade the reserves among one another. Primarily, they do so in a free market where they exchange reserves for other assets. Funds are generally costly for banks to hold because the reserve bank gives only a low rate of interest - often zero - on these balances. Hence, any bank with more reserves than it needs will try to exchange them for some interest-bearing assets like a treasury bill or other short-term debt instruments.

Provided the financial system has extra reserves, more banks will desire to buy rather than sell such instruments. In the absence of some other factors working simultaneously on the market, the outcome is a bid up in the price of these instruments, lowering the interest rate obtained by investors who hold them (PaLley, 2017)<sup>172</sup>.

The mid-term reserve bank must ensure monetary aggregates' stability by such measures as a progressive liquidation of government debt with the non-banking system and active management of liquid assets. The monetary authority should assure healthy financing of the government's cash flow through treasury bonds and avoid national banks granting the loan. The introduction of treasury bonds will allow the reserve bank to actively utilize this critical monetary policy tool to regulate the money supply. The further reduction of credit to the public sector will create space for increasing advance to the private sector for productive purposes.

As article 23 of the Law of the Conduct and Organization of the National Bank of Cambodia describes, the financial relationship with public entities of NBC essential with Cambodia's Royal Government is as below.

- The national bank shall assist in the debt management of the RGC or public entities by conducting securities operations, including advising on the timing of security issuance and promoting the development of money and capital market.
- The national bank may agree to behave as the agent of the RGC or public entities for the following transactions:
  - o Marketing of securities issued by the RGC or public entities, and also function as a registrar and transfer agent;
  - o Disbursement of principal, interest, and other charges on such securities.

Suppose we have the government's securities to be traded after that. In that case, the NBC may purchase, sell, or repurchase the government's securities maturing within 90 days that have previously been publicly issued,

#### 4.5.4.1. Negotiable certificate of deposit

Negotiable CD, ordinarily abbreviated as NCD, is a short to medium-term investment. They can be bearer instruments and also negotiable securities, and maturity up to one year. The investment is being sold at a lower

in open market operations, or in discounting operations, or credit extension to financial institutions (NBC Article 26, 1996c)<sup>173</sup>.

Again, NBC defines the open market operation as operations to purchase or sell dollars against the riel to make stable the exchange rate fluctuation between the two currencies. The function of NBC regulates the money supply in circulation, but it isn't easy to handle because of strongly dollarized for Cambodia's economy. Nevertheless, NBC's operations can help adjust exchange rate swings and keep up a stable and desirable inflation level. In the absence of a market for government treasuries or bonds, the national bank's OMOs are chiefly in the type of dollar auctions. The arm is to dominate the dollar-riel exchange rates through purchases or sales of dollars or riel. NBC uses the dollar auctions to smooth exchange rate variation, thereby accomplishing price stability (Naron, 2011b)<sup>174</sup>. Regrettably, open market operations do not occur in Cambodia because lack of government-backed security such as treasury bills or bonds (Capannelli and Menon, 2009)<sup>175</sup>.

According to a national meeting of cabinet ministers headed by Prime Minister Hun Sen on September 5, 2020, the RGC would submit a proposed law permitting government bonds to be listed on the Cambodia Securities Exchange for the first time. The proposed law would allow the RGC to issue bonds in both local currency and greenback, reducing Cambodia's dependence on external debt and international aid programs to raise funds. A government bond is a financial security published by the government to fund government spending and obligation, and it's capable of paying periodic interest payments known as coupons. Bond issuance by national governments is frequently seen as low-risk investments attributable to the backing given by the issuing government. Cambodia has also been urged by the Asian Development Bank (ADB) to strengthen its local market for government and corporate bonds while enhancing the riel as the country's currency (Khmer Times, 2020)<sup>176</sup>.

price than its face value, and these instruments are negotiable within the secondary market. NCD was initiated in 1961 by First National City Bank of New York (now Citibank); the flexible tool enables many extensive banks to rapidly and precisely raise funds for lending. They could draw liquidity from investors as well as businesses and households (OCC, 2021)<sup>177</sup>.



Cambodia securities market is in the early stages of development due to: (i) the shortfall of tradable tools, such as government securities, that could pave the way for the escalation of the interbank market; (ii) the nonappearance of market makers and network of intermediaries; and (iii) the short of benchmark rate against which securities would be priced when they are issued. Owing to these reasons, the NBC has set up an interbank market development project by issuing Prakas B-5-010-183 dated October 15, 2010, on tradable securities' issuance. The objectives of the interbank market development project are:

- For the National Bank of Cambodia
  - o Foster inter-bank more effectively
    - Develop extra-effective instruments for implementing monetary and foreign exchange policy
    - Re-allocate financial resources amid financial institutions and enlarge financial intermediaries
    - Reduce bank relying on capital sources from depositors to fulfill short and medium-term liquidity
    - Correspond to financial market demand
      - ✦ Invest remaining idle short-term liquidity

**The advantages of holding an NCD include:**

- No credit risk: Because NBC issues NCDs, no credit risk is relevant to the investment
- Interest earned: NCDs are interest-bearing instruments. Thus, banks who invest their excess reserves in NCDs will earn interest,

which commercial banks mostly have no option to invest their excess liquidity above its usage

- ✦ Reduce relevant risks with liquidity management and provide loans to inter-banks. After preparation for around three years, NBC officially launched the inter-bank market development project on 09 September 2013

- For private commercial banks
  - o Deposit temporary excess reserve funds at the central bank
  - o Diminish risks connected with the supply of liquidity
  - o Earn interest income
  - To have more effective instruments for pursuing monetary policy and FX objectives
  - To re-allocate financial resources among FI and to boost financial intermediation
  - To respond to the needs of the market for investing temporary excess liquidity

To eliminate doubt on a negotiable certificate of deposit, we would like to illustrate the advantages and disadvantages below.

which will be rewarded on the maturity of their checking accounts held with NBC. The interest on NCDs is comparably higher than fixed deposits. The interest will be calculated in the following:

$$\text{Interest} = P \times r \times t$$

Where: - **P**: is the principal amount

- **r**: is the annual interest rate expressed as a percentage divided by the actual number of days in each year

- **t**: is the NCD's tenor

- Highly liquid: NCD is a short-term instrument, risk-free, and issued by the national bank. Thus, it can be traded in a greatly liquid secondary market.

The repurchased formula which is used to buy back the NCD is:

$$\text{Repurchase value} = \frac{\text{Principal} + \text{interest}}{1 + \left( \frac{\text{repurchase rate as \% per annum} \times \text{remaining term to maturity}}{\text{number of actual day in each year}} \right)}$$

I will show how to calculate the repurchase price of NCD as below:

For example, XYZ bank decided to sell the NCD back to NBC on 14 Aug 2017. The holding period from the purchased date is 73 days, while the remaining days to maturity is 17 days. The repurchase rate on 14 August 2017 is 1.30%.

Maturity date

Issuing date

02-June-17

73 days

17 days

31-Aug-17

Face value

=1,000,000

Repurchase date

Future value

14-Aug-2017

= 1,002,219.18

$$\text{Repurchasing price} = \frac{\text{Future Value}}{1 + \left\{ \text{Repurchase rate} \times \frac{17}{365} \right\}} = \frac{1,002,219.18}{1 + \left\{ 1.3\% \times \frac{17}{365} \right\}} = \$1,001,612.72$$

If the holder keeps it until maturity, he will get in a total of \$1,002,219.18, but on 14 August 2017, the holder needs funds to support his operation; therefore, he can sell this instrument before the deadline. Even he sells it before reaching maturity, but he also can earn an interest of \$1,612.72.

- Transferrable: The NCD's owner can transfer the ownership to any party at any time in the

interbank lending market. Then, the NBC will transfer the ownership once it receives the notification from the buyer and seller.

- Collateralized: NCDs can be utilized as guarantee for the advance facility from NBC and the interbank market.

**Disadvantages of NCDs:** despite it has many merits, an NCD incurs the following risks :

- The NBC determines maturity, and thus investors might be unable to invest funds with maturity as desired.
- The NBC sets the interest rate that is tied for the NCD's entire term; thus, investors cannot get a higher interest rate if the market rises.
- Any request to sell an NCD back to the NBC is accepted to the latter's discount. The national bank encourages investors to sell NCDs on the interbank lending market.
- The buyback price for an NCD is banking on the holding period and NBC's discount rate.
- At the time of investment, an investor could face interest rate risk due to market volatility.

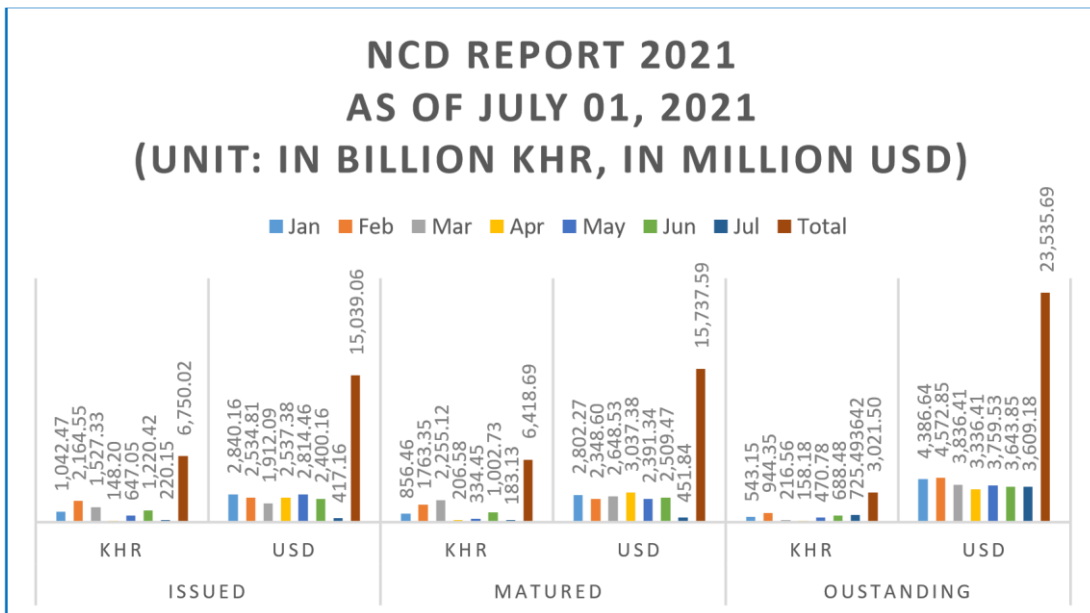
NCD is a short-term interest-bearing debt instrument issued by the NBC. National Bank issues this security in KHR and USD to resolve depository institutions to invest their short-term liquidity excess. Maturity of KHR/USD NCD starting from one week to one year with interest determined by NBC, which fluctuates daily according to

market condition. The minimum subscribed volume of the NCD is processed from 200 million riels (for KHR) or \$50,000 (for USD). The maturity of NCD consists of 1 week, 14 days (2 weeks), 28 days (1 month), 91 days (3months), 182 days (6months), and 364 days (1 year).

In other words, NCDs can be utilized as collateral for LPCO. Historically, the first repo transaction would be on the 18th of October 2016, and other repo transaction dates according to financial institutions' demand on home currency for their lending operation.

To make NCD more attractive, the NBC has increased the interest rates on U.S. dollardenominated NCD by 0.25 percent for tenors of 91 days, 182 days, and 364 days from March and further raised 0.10 percent for all tenors from October in 2019. In other words, NCD denominated in the US dollar in 2018 has increased, whereas the need for the riel denominated NCD has declined. US dollar-denominated NCD was USD 22.1 billion, an increase of 10%, and absorbed 55% of US dollar excess liquidity. This expansion reflects the attractiveness of US dollar-denominated NCD as it is a good alternative to cash holding. Ultimately, the riel denominated NCD was 11.6 trillion riels, a decline by 16.8%, and absorbed 35% of the riel excess liquidity. This downturn was due to banks and microfinance institutions increasing their domestic currency lending under NBC's Prakas, requiring at least 10% of the total loan portfolio to be in riels by the end of 2019 (NBC Annual Report, 2019b)<sup>178</sup>.

**Figure 4.9: Outstanding of Negotiable Certificate of Deposit As of July 01, 2021**



Source: National Bank of Cambodia

As shown in Figure 4.9, the NBC has issued NCD denominated in KHR 68,944.01 billion and USD 124,588.31 million in January 2021 from 2013-2021.

Table 4.1: Negotiable Certificate of Deposits Transaction from 2013-2021

No.	Transaction's Description	USD-NCD		KHR-NCD	
		Volume	Value (million)	Volume	Value (billion)
1	Total Issuance	13,982	124,588.31	4,605	68,944.10
2	Matured	1,348	120,944.46	4,544	68,255.63
3	Bought Back	114	803.26	57	549.10
4	Outstanding	502	3,643.85	43	293.66

Source: National Bank of Cambodia, Operation Department (2019)

NCD increased the effectiveness of banks and financial institutions' liquidity management, and the issuance of NCD denominated in USD was \$30.8 billion raised 45.3% compared to 2019. Whereas the distribution of NCD denominated in KHR was 10.9 trillion riels increased only 4%. Moreover, the interest rate on NCD has been reduced to encourage banks and financial institutions to transfer liquidity from buying NCD to provide loans that support economic activity being suffered from the world health crisis. According to the semi-annual report of NBC (2021)<sup>179</sup>, the surplus of liquidity has been absorbing a part of NCD. Negotiable Certificate of Deposit (both US dollar and Riel) issued in first-semester amount 67.3 trillion riels (equal 16.6 billion US dollar) increased 17.6 percent. NCD in US dollar approximate to \$14.8 billion (raised 15.9%) and NCD in riel about 7.3 trillion riels (increase 33.4%).

NCD yields lower returns compared to other stock market or debt fund management options, and the returns earned by investors remain fixed. Due to the lower interest rate offered by the national bank, the commercial banks with excess reserves would switch their investments to other financial assets which provide higher profits. NBC can absorb limited reserves from financial institutions, so it would restrain the national bank from performing its role.

#### 4.5.4.2. Liquidity-Providing Collateralized Operation

Liquidity Providing Collateralized Operation (LPCO) is a loan granted by the NBC in Khmer riel to financial institutions that are demanded to own NCDs and use them as collateral. NBC would determine the amount of riel liquidity and its operation timing in line with monetary policy objectives. LPCO was launched in October 2016 in an attempt to reallocate the excess resources to those who need them. The auction of LPCOs usually operates on Tuesday, and the settlement date is

on Thursday. In March 2018, LPCOs with tenors of three and six months were launched and extended to one year long. The placement of USD-NCD as collateral to LPCO would be subjected to a haircut of 5% further to 3% in late 2018. Moreover, the LPCO would be executed through two mechanisms: liquidity providing through an auction and collateral pledging through a Repo. I would introduce the auction procedures of LPCO as below.

- Before the auction: banks and financial institutions shall
  - Sign a Master Agreement with NBC
  - Apply for NBC Platform usage, and NBC will publish an intended allotment volume a week before the auction date.
- Auction Date
  - NBC announced the minimum bid amount and interest rate for banks at 8 am
  - Banks submit bids that include the intended amount and interest rate before 12 pm through the NBC platform (in case NBCP does not work, the bank can submit bid through email or formal letter to the operation department)
    - The auction result will be published at 2 pm; participating banks will then receive a confirmation letter of the LPCO auction.
- Settlement Date
  - Usually set 2 days after the auction date
  - Banks will receive liquidity at the settlement date after they present sufficient collaterals to NBC.

Open market operations aim to manipulate the overall money supply by indirectly expanding or contracting it. The LPCO has the following functions:

- Establish a benchmark rate for the interbank market and put monetary policy in place.

- Increase the demand for NCDs as a secure tool in the interbank lending market.
- Encourage the use of KHR via increasing domestic currency liquidity, allowing banks and MFIs to make more KHR-denominated loans and the NBC to absorb greenbacks from the market by selling USD-denominated NCDs.
- Encourage banks and MFIs to boost KHR-based transactions since the NBC could require them to do so, like lending.
- Support the agriculture industry, which requires additional funding to purchase commodities.
- According to a joint survey conducted by JICA and NBC, KHR is mainly used in agriculture; therefore, providing liquidity in the indigenous currency will help finance the sector.
- Contribute to lowering high-interest rates.

As H.E Chea Serey said, “Through this instrument, [the NBC] hopes that it will influence the interest rate in the market since the NBC will issue riel to MFIs and commercial banks for their lending operations [and]...If successful, it will add convenience to managing the Cambodian banking sector” (Khmer Times, 2016)<sup>180</sup>.

The volume of LPCO has expanded dramatically since the market's demand for riel climbed by at least 10%, banks and financial institutions raised their riel loan portfolio by at least 10%. In response to this demand, the amount volume to be auctioned each time has been increased from 100 billion riels to 200 billion riels, then 400 billion riels, and the operation has been done twice a month since March in order to comply with the request liquidity more flexible and timely. As a result, by November 2019, the auction proposal had reached 5,8 trillion riels (up 6.3 times from 2018 and 42.5 times from 2017), while the successful amount had reached 3.4 trillion riels (an increase of 3.9 times compared with 2018 and 24.6 times compared with 2017) (NBC Annual Report, 2019b).

**Table 4.2: Liquidity Providing Collateralized Operation (2016-2019) (million riels)**

Year	Auction_Amt	Bidding_Amt	Awarded_Amt
2016	240,000	28,400	28,400
2017	720,000	134,000	134,000
2018	6,300,000	794,870	696,870
2019	41,300,000	2,705,300	2,988,985
<b>Total</b>	<b>48,560,000</b>	<b>3,662,570</b>	<b>3,848,255</b>

Source: National Bank of Cambodia, Department of Operation (2019)

The NBC issues LPCO in response when the private commercial banks and microfinance institutions need riel to fund their operation to place NCD as collateral with NBC to borrow funds. It is a step towards the development of interbank lending in Cambodia. As presented in Table 4.2 explained us that in 2016, NBC provided KHR 28,400 million, increased 372% in 2017, 2,354% in 2018 and 10,425% in 2019.

Ultimately, we can summarize the constraints of monetary policy in the context of highly dollarized in Cambodian economy as below.

- Since Cambodia’s economy is highly dollarized, NBC cannot effectively measure and control the money supply of the dollar-denominated economy. It indicates that NBC is not completely independent, as any changes in the US Federal Reserve's monetary policy might impact Cambodia's economy through foreign exchange

rate consequences. The constraint is that by modifying the money supply, the country gives up some of its potentials to dispose of its economy through monetary policy. The dollarizing country effectively delegated its monetary policy to the Federal Reserve of the United States. It can be a negative element if US monetary policy is established in the interests of the US economy rather than the benefit of dollarized countries during the period.

- There are no practical monetary policy tools under dollarization to affect macroeconomic and financial positions in the economy. Because the central bank would be unable to print national currency, there are no tools such as the Repo rate, bank rate, or other refinancing facilities that provide the central bank with leverage interest rates and other market financial circumstances.

- The National Bank of Cambodia seems unable to direct interest rates in the absence of bank refinancing, undermining the effectiveness of interest rate policy as a monetary instrument. The gap between denominated deposits and loans in USD and KHR reflects the significant risk premium and processing cost (Capannelli & Menon, 2009)<sup>181</sup>.

Due to the high level of dollarization, the limits of NBC's monetary policy actions are the lack of a well-functioning money market, institutional and administrative deficiencies, fiscal dominance, and the lack of capability and credibility of monetary authorities. And the dominant sectors of the economy and financial services are predominantly immune to exchange rate fluctuations, and NBC's policy interest rate does little to alter external borrowing decisions, primarily in US dollars.

More precisely, strong dollarization constrains both monetary and foreign exchange policy. The unanticipated effect of one of the unintended outcomes has been the slow growth of a formal foreign currency market. Although dollarization imposed some policy discipline in the aftermath of the post-conflict reconstruction period, the consequence has been the lack of an independent monetary policy and the exchange rate manipulation to facilitate the adjustment.

The high level of dollarization also inhibits NBC's ability to perform as a last resort lender to restrict monetary policy. In the case of a sudden run on a bank's dollar deposits, excessive dollarization necessitates facility. Dollar deposits currently account for 134 percent of gross international reserves and 87 percent of overall deposits in the banking system. In the same attitude, there is a risk of Non-Performing Loans (NPLs) due to exchange rate depreciation from debtors of loans in US dollars.

The shortage of a well-functioning money market and financial exclusion of the majority of the population obstruct the traditional monetary transmission mechanism from monetary interventions to the money market and credit market:

- The limited depth and liquidity of the interbank money market prevent the banking system from

successfully transmitting monetary impulses to financial markets. Money markets, foreign currency markets, and secondary markets for securities must work well for monetary policy to be spread to the economy. They ensure liquidity distribution between financial institutions with excess liquidity and those in need of cash and set the price for liquidity, which impacts the credit market.

- Financial fragmentation reduces the ability to affect money supply through marketbased mechanisms, such as banks' lending activities, which create money.
- Simultaneously, a change in the exchange rate may affect the general public's national currency holdings. The monetary authority's institutional and administrative deficiencies obstruct policy implementation.
- Flaws also hamper NBC's liquidity management in banking supervision and market monitoring. It could lead to inaccurate estimates of commercial banks' refinancing needs or surplus reserve levels. A largely open economy of RGC also challenges NBC, resulting in a substantial exchange-rate pass-through to inflation.

The Mundell-Fleming-Dornbush model illustrates that an open economy limits monetary independence even under a floating exchange rate regime. When currency rate pass-through is substantial, conflicting policy objectives weaken the reserve bank's credibility and further erode autonomy.

With a high share of imported products in the CPI, inflation in the RGC is vulnerable to exchange rate fluctuation. The legitimacy and competence - or lack thereof - of policy institutions to anchor agents' expectations also influences the level of monetary policy independence. Conflicting objectives - price stability and a zero deficit for the reserve bank - may cast doubts about the RGC's determination and



ability to control inflation. Higher inflation expectations will lead to higher risk premiums and exchange rate pressures. Under these situations, prudent monetary policy under a floating exchange rate regime may involve anchoring monetary policy to a significant partner for small open economies.

- Open Market Operations (OMO) do not exist in Cambodia due to a lack of government back securities such as treasury bills and bonds. But some productions are employed to intervene in the market, such as LPCO, NCD, and Bakong system.

- It would lose revenue from seigniorage to finance budget deficit as much as \$320 million is being lost annually due to Cambodia's reliance on the US dollar. Cambodia's loss of seigniorage, the value a country gains in producing its currency, equates to about 2% of total GDP (The Phnom Penh Post, 2014)<sup>182</sup>.

- Also, Cambodia is currently the most dollarized economy in Asia, with an estimated 85 percent of all currency circulating being US dollars. However, the US dollar circulation was 80 percent during 2010.

- Dollarization reduces the government's ability to issue medium and long-term debt in domestic currency - "the original sin" - further exacerbating shocks' vulnerabilities and thereby amplifying macroeconomic and output fluctuations.
  - The money, capital, and inter-bank markets tend to be inactive. Securities issued by the government may have no material impact on secondary market

trading due to their issuance's non-competitive nature and being short-term (Menon, 2008d)<sup>183</sup>.

- Furthermore, NBC's real practices with NCD, LPCO, and other applied daily interventions are essential to push up a more de-dollarized economy and foster sustainable growth in Cambodia. The new monetary tools such as Bakong, digital finance, and others are very convenient to test the market to encourage transacting the KHR in Cambodia.

- Lastly, The loss of effective control over monetary policy is the most serious difficulty associated with substantial dollarization. Because the monetary base markets have a minimal local currency component, it is harder to regulate monetary expansion, which diminishes the effectiveness of monetary policy as a tool to stabilize the economy:

- Since only a portion of the monetary base is in local currency
- Lower international reserves because the reserve bank accumulates less of the foreign currency as reserves when transactions are done in that currency
- Loss of an effective exchange rate policy - the authorities will be unable to manage the exchange rate in response to exogenous shocks, necessitating real economy adjustment.

- A financial sector that keeps large amounts of foreign currency deposits loses its role of last resort lender.
- Due to excessive dollarization of liabilities and large output variations, public and private sector balance sheets are sensitive to foreign and domestic shocks, involving nominal price and wage flexibility.

Actually, given the absence of a money market, for example, government bonds, it does not allow the NBC to utilize the policy rate rather than four monetary policy instruments, including reserve requirement, NCDs, LPCO, and the nominal exchange rate anchor. Reserve requirement has a prime tool, but its rate can not be modified frequently. NCDs help absorb excess liquidity in the banking system. In contrast, LPCO helps channel riel credit into microfinance institutions that are short of riel liquidity to smooth out their liquidity shortage and grant riel loans to households and businesses in the agricultural sector at more favorable interest rates.

#### 4.5.4.3. Marginal Lending Facility

MLF or the Marginal Lending Facility Rate is the interest rate banks offer when they borrow funds from the reserve bank overnight. For instance, they have to provide collateral to guarantee those funds to secure the loan (EBC, 2018)<sup>184</sup>. Many central banks' monetary policy instruments allow licensed financial institutions to procure against eligible collateral at a specified interest rate for overnight loan (one business day) liquidity. This facility is intended to meet temporary, very short-term liquidity needs and

#### Conclusions

Cambodia has a partially dollarized economy, mainly in terms of payment and financial dollarization. Deeping to the significant dollarization of the economy, it is difficult for NBC to implement monetary policy and increase its susceptibility to liquidity and solvency risks. Under these conditions, NBC lost seigniorage. The external debt issue exacerbates; the money supply denominated in foreign currency in monetary turnover significantly affects the exchange rate, increasing inflation and giving rise to

generally offers a beam for the bank's call rate on the money market.

NBC launched the marginal lending facility in 2019 to tackle the problems of liquidity shortage in the money and interbank market of financial institutions in Cambodia. It is a short-term liquidity instrument with an interest rate predetermined by the central bank and obtained in exchange for collateral. It also helps maintain short-term stability in the interest rate on the interbank lending market. It regulates the interest rate alley at a level deemed appropriate for economic structures by the central bank. The facility's interest rate deals with a ceiling for the short-term on the interbank market to prevent rates from overshooting.

The roles of the Marginal Lending Facility (MLF) are as follows:

- Supply short-term liquidity in domestic currency to financial institutions in need, with a maturity of up to one week
- Relieve secure liquidity in domestic currency to banks and financial institutions unable to get it through LPCO because they could not bid to get liquidity from an LPCO
- Setup an interest rate alley; the NBC officially has no deposit facility
- Develop an instrument providing liquidity in national currency to improve the effectiveness of liquidity management of KHR riel by banks and financial institutions
- Determine short-term interest rate on the interbank market

informal economic growth. So, we need to deal with this phenomenon immediately because high dollarization causes impressive adverse effects on the economy.

Indeed, dollarization will hinder the application of monetary policies conducted by NBC. The discount window instrument will help the event of crisis and insolvency of the licensed financial institutions. Due to US dollar use for its operation, the central bank cannot lend foreign currency to rescue those banks because NBC cannot print US dollars.

Furthermore, we still have limited use of open market operation even though we have NCD and LPCO to build up riel use. The government has not yet issued treasury securities, so the monetary authority cannot buy or sell government securities in the open market operation as the primary means of implementing monetary policy. On the other hand, NBC can use foreign exchange intervention policy, reserve requirement ratio, repo which are transactions used to finance ownership of bonds and other debt securities (NCD), and recently, the initiation of the LPCO. By the way, it could be possible to overcome dollarization achieving macroeconomic stability in the country by improving the legislation,

consistency of monetary and fiscal policy, and implementing reasonable procedures for public debt administration, via the performance of monetary policy aimed at controlling inflation and currency risks, by reducing budget and payments balance deficits, carrying out a policy of inflation targeting, via financial market development and by increasing domestic payment systems efficiency. After those achievements, economic incentives for national currency usage will become effective and restore the confidence of domestic currency. Comprehensive application of such measures can minimize the adverse effects of dollarization, and it overcomes its excessive level.

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