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Constraints' Monetary Policy – A Case of Cambodia

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DOCTORAL THESIS

Constraints' Monetary Policy – A Case of Cambodia

Author: Lay Sam Ean **2021 Prague**

DECLARATION

I, ***Lay Sam Ean***, declare I have prepared the submitted diploma thesis independently under the supervision of the thesis supervisor and cite and list all user information and literary sources in the list of used literature. As the author of this thesis, I declare that I did not infringe the copyrights of third parties during the preparation of this thesis. I am fully aware of the consequences of violating the provisions of 11 of Act 121/2000 on copyright and related rights.

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This dissertation has been submitted for examination with my approval as (The University Supervisor)

Signed: Date: …….

Supervisor: Prof. Dr. Yean Rithy and Prof. Atanga D. Funwie

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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.

Keywords: Constraints, Monetary Policy, Dollarization, Seigniorage, International Reserves, Lender of Last Resort, Liquidity Providing Collateralized Operation.

Contents

CHAPTER 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 Rough, 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)[1].

Cambodia has become partially dollarized, owning 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)[2].

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)[3].

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)[4].

Referring to Duma (2011a) [5] 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)[6]. Similarly, Cambodia's real growth had fallen from 6.7 percent in 2008 to minus (-1.5) percent in 2009 (Economist Intelligence Unit, 2011)[7]. Due to these challenges, it will take more time to downgrade dollarization in Cambodia's economy.

1.2. 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)[8].

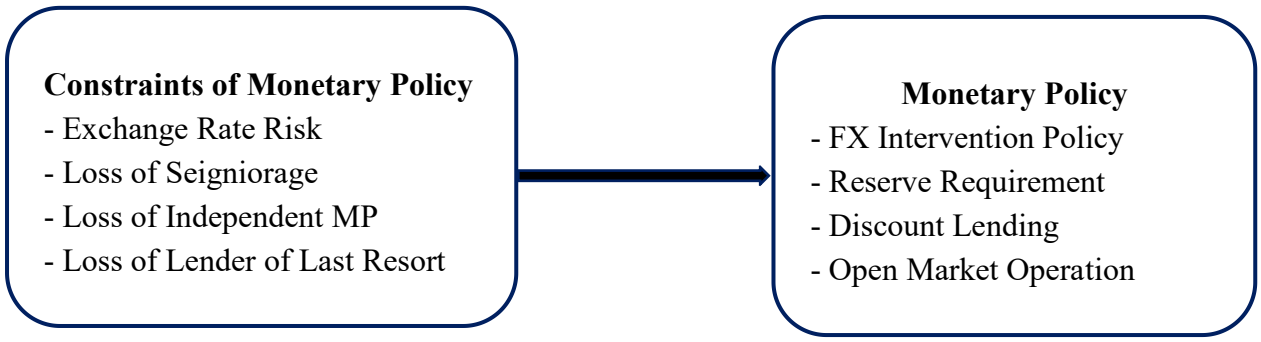
The poor typically have to compensate for some goods and services in the US dollar while their revenues are in national currency. Dollarization worsening the distribution problems

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)[9]. 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.

Figure 1.1: Model of Research



1.3. Objectives of the Research

The influences of dollarization have been studied and documented in great detail, attracting many scholars internationally over the last decades due to the increase in multiple currencies in their economy. The study of constraints of monetary policies in an extraordinary dollarized economy has become progressively essential. It has been carried on extensively in many countries, so do it in Cambodia. The objectives of the research project are:

- To find out the challenges of implementing monetary policies in Cambodia
- To discover some strategies that will be used to reduce dollarization in Cambodia

1.4. Research Questions

To accomplish the final goal of the research, we call for responding to some questions with adopted the following objectives:

- What are the causes of dollarization in Cambodia?
- What monetary policy instruments had the Cambodian national bank conducted under dollarization?
- How does dollarization obstruct the Cambodian national bank from obtaining its monetary goals?
- What are the national bank's strategies and Cambodia's Royal Government to promote riel currency usage?

1.5. Limitations and Scope of the Research

The study will look at how the vast appearance of the greenback in Cambodia from 2000 to 2010 affects Cambodia's monetary policy. Also, international experience relates to reducing dollarization and de-dollarization in the context of Cambodia would be proposed.

1.6. Significance of the Research

This research would help policymakers have comprehensive knowledge of the monetary policy practice in a highly dollarized economy. There were many problems related to unstable macroeconomic conditions deteriorating belief in the home currency cause by dollarization. Besides, we will find some strategies proposed to slow down dollarization in Cambodia since the domestic currency is vital for making the national economy independent and blooming. It is also a core value for a nation to have its currency recognized in the international stages.

1.7. Hypotheses

If Cambodia's economy is faced with high dollarization, then significant effects will be on monetary policy.

1.8. Research Methodology

This dissertation will be fulfilled through available secondary data on the topic. I will be using official pamphlets of Cambodia national bank, international monetary fund reports, Asian Development Bank's publication, articles of international NGOs, research papers published in academic journals, and other internet sources or blogs as secondary data.

1.9. Explanation of the topic

Our paper is about the constraints of monetary policy in the case of Cambodia's economy; therefore, to clearly understand the issues, we will demonstrate some keywords.

Constraints: Merriam-Webster (2019)[10] defines constraints as the state of being investigated, restricted, or compelled to avoid or perform some actions.

Monetary policy: is the macroeconomic policy instructed by the federal reserve (The Economic Times, 2019) [11]. It fears the running of the granting of money and interest rate. The monetary policy can be thought of as an economic strategy of a government that opts to expand or contract its money supply. The country's government can use demand-side economic policy to accomplish macroeconomic objectives like inflation, consumption, liquidity, and growth. In other words, it would be applied monetary policy naturally through the central bank on three crucial tools: changing the required reserve ratio, interest rate, and open market operation.

Anyway, we can conclude that there are challenges or compellation to impose research bank's actions to implement its policies to stimulate economic growth; there are multiple currencies circulated in Cambodia's economy.

1.10. Structure of Research

The research structure is essentially a work summary, with anticipation to provide the research towards the objectives we are finding. This dissertation will align with the five guidelines as the following:

Chapter 1: Introduction

This point will be covered the rationales for the research, problem statement, objectives of the investigation, research questions, scope of study, methodology of research, and structure of the study.

Chapter 2: Literature Review

This research stage consists of the history, function, duties, mission, and structure of the National Bank of Cambodia. This part will also cite some theories related to the topic. It comprises the concepts, reasons, advantages, and disadvantages of dollarization, including the monetary policy tools, constraints of executing monetary policy, and some encouraging measures of the uses of national currency.

Chapter 3: Research Methodology

This section will focus on types of analysis, data sources, sample size, census methods, data collection procedures, statistical tools and analyze the data.

Chapter 4: Research Result

This division will illustrate the actual practice of Cambodian experience in dollarized economy. Further, it emphasizes how to measure dollarization in the economy, the positive and negative effects of dollarization, and particularly the monetary policies carried out by the national bank. **Chapter 5: Conclusion and Recommendations**

Finally, this segment will judge what we have done in our research and suggest some proposals according to the situation of geography and economy to cut down the use of foreign bills in Cambodia.

CHAPTER 2

LITERATURE REVIEW

2.1. National Bank of Cambodia

This section will briefly describe the antiquity and progress of the national bank from its initial establishment until nowaday and exhibit its function, mission, and structure.

2.1.1. History of National Bank of Cambodia

The National Bank of Cambodia, the nation's central bank, is the monetary and supervisory authority, the management of monetary and exchange policies, the regulator of financial institutions and banks, and the home currency's supervision.

- **Prior French Colony**

Cambodia had a history of using stretch money compared to other countries in the region and worldwide. According to the study of Jean-Daniel Gardère shown that elasticity of using this resulted from (i) Cambodian economy relied on the majority on agricultural sector with barter economy traditional shared (ii) Cambodia did not produce much precious metal for fulfilling in exchange and (iii) Khmer capital has been moved slowly from international trade region to agricultural facility region which made low demand on the domestic currency. Referring to history advocates that Cambodia had used less money than had the source from Europe, Latin America, and China got to enter to trade on Cambodia's port and toured since the first century. Evidence encountered in Angkorborey district of Takeo province near Phnom Da Mountain found a cold coin written as "Isanpura" This finding became a new hypothesis that Cambodia had produced national coins since the Isanburi period. The coins we supposed the first Cambodian money called "brak long" as gold and silver which the front face has naga picture and has been issued by Preah Srei Chedthea Thi Reach Rea Mea Thibtei in the 16th century. According to Adhémard Leclère, wrote in a book in 1914 "Cambodia History" Preah Srei Chedthea time, Cambodia opened trade widely with the presence of foreign countries such

Portugal, and Spanish came into Cambodia to do business so, economic and commercial activities grew remarkably. The tax system has also been organized, and the king issued Brak Luong to show the sovereignty and his Dharma.

After 1846, king Ang Duong printed a silver castle in which one side depicted swan and another side Angkor Wat picture and beneath written "Krong Kampuchea." In 1860 King Norodom published money made from bronze written both Khmer and French.

Even though the Khmer kingdom sequent issued money, this money did not circulate widely because of less supply; people did not have the custom to exchange habits. This money used for a representative of the country shown sovereignty over other mediums of exchange.

- **French Colony Period (1863-1953)**

Under the French guardians for 90 years, Cambodia received favorable outcomes from protecting the economy's border and modernization. In 1875, France's Indochina Bank (Banque de l'Indochine) got the sole right to issue money for Indochina's region for Cambodia, Laos, and Vietnam. After three years, Indochina printed Piastres money as a coin for utilization in these three countries since 1891. After subsequent Indochina monetary system reforms, France insisted on withdrawing printing money from Indochina banks by handing it to each government in Indochina. Since 1930 France agreed and pronounced to revoke the printing license from Indochina bank in September 1944. The negotiating to establish Indochina Printing Institutes was authorized in November 1950 in Po city and the signing quadrilateral convention in December 1950 in Paris. Finally, in 1952 Printing Money Institute of Indochina Association was established with a headquarter in Phnom Penh Central City and issued currency for usage in these three countries.

- **Sangkomreas niyom Period (Socialism 1953-1970)**

After independence from France, Indochina State Association Union (L'Union des États Associés d'Indochine) held a quadrilateral meeting (France, Cambodia, Vietnam, and Lao) in Paris to find out a solution in demanding independence from the monetary sector for each country. Later on, France gave monetary sector independents to all these three countries in a quadrilateral meeting on December 29 1954, meaning that each country had one central bank and its currency. After that, the NBC was built on December 23 1954, started processing in May 1955, and printed riel in September in the same year.

NBC served actively to national construction policies of socialism, and the riel was strengthened to the local economy revolution. In late 1963, the banking system of Cambodia was amended by NBC from semi-autonomous administration to state banks under public entities as industrial and commercial characters. After that, the opening of local and foreign private banks was transformed into state-own banks.

- **LON NOL Regime (1970-1975)**

After Cambodia got peace for a while, LON NOL made a coup d'état to drop King Norodom Sihanouk from power on March 18 1970 and transformed to the Khmer Republic. The coup made the country fail in fire-war, instability turmoil, and the economy started falling to a severe crisis. The war happened almost everywhere, production decreased dramatically, and the whole country relied on foreign aid. And the LON NOL's authority also printed additional banknotes in socialism to authorize to circulate. The banking system has been re-liberalized to facilitate specialized banks and parallel with state banks under NBC's instruction and supervision. However, privatization of state-owned companies and foreign commercial liberalization had slowly progressed. Together with civil war and high expenditure on transportation fees, many factories and companies closed sequentially. The government budget deficit grew seriously. The national bank has been pressured to print additional money to fulfill the government's fiscal deficit, explicitly for civil servants, state employees, and the military sector's spending. Riel dropped in value until the controlled level. The gold used to be 375g = 3000 riels has been increased to 400,000 riels.

The inflation rate constantly increased from 12% in 1970 to 71% in 1972 and 228% in 1974. With the high inflation and loss in value on the national currency getting started, people lost confidence in domestic currency subsequently. The price of food, fuel, and appliance was always stable, changing to boost to unmanageable. Food price was remarked to be raised highly due to lack of insufficient supply from provinces. One bowl of noodles, which used to be only 5 riels, has surged to 500 riels and 1,000 riels in one bowl in 1874.

- **Abolition of Monetary and Banking System (1975-1979)**

On March 17 1975, the ruling power of the LON NOL authority for around five years was overthrown, entered to continue in power and implemented a policy of genocide by killing innocent people. It broke down economic and social infrastructures such as schools, hospitals,

administrative offices, commercial buildings, and monasteries, and by transforming Cambodia into an ancient slavery, society meaning "eating together, sleeping together." The management of this regime eliminated private ownership, markets, money, and all right to freedom in case of fundamental rights such as the right to survive and no right to opt to marry a couple was a force to marry by the organization.

- **The Rehabilitation of Monetary and Banking System (1979-1986)**

January 7 1979 was the great victory day historically and the second birthdate of Cambodian people. The United Front for Solidarity of Cambodia was led by Samdech Chea Sim, Samdech Heng Samrin, and Samdech Hun Sen delivered people and saved the country, homeland, and everything from POL POT's genocide. Thus, to reconstruct the country from all sectors, the government established the national bank on October 10 1979, named "National Bank of Cambodia's People." NBC received technical assistance and other friendly countries, including Vietnam and the former Soviet Union. Only six months from creating the national bank, a new Khmer riel represented national sovereignty was issued and re-circulated on March 20 1980 to be used as the measure, the medium of exchange, and saving instruments for people operating in daily activities. The riel banknote's re-circulation was congratulated and welcomed warmly and a successful government event in implementing the economic policies.

Reprinting and circulation of riel helped make economic activities re-survived almost all sectors and allowed the state to commerce starting activities in gain-loss businesses, granted private commerce and markets to be a regular activity to progress. State budget system and banking services were survived and reactivated. At that time, the Cambodian banking system formed as the mono-banking system. The National Bank of Cambodia's People played three critical roles: monetary authority, commercial banks, and national treasury.

- **Economic Reform Process (1986-1993)**

Since 1986, the Cambodian economic situation has positively evolved, and notably, the government reformed the economy from a collectively planned economy to an economic mechanism that links to the market and reaches a free economy. The banking system also reformed, and national bank building was re-established in 1990. In 1991, to serve money transfer, deposit, and payroll for UNTAC expenditures in Cambodia, foreign private banks

opened branches in Cambodia with the presence of specialized banks; Cambodia did not have laws to govern these institutions; therefore, in 1992, the government decided to promulgate two regulations. NBC enacted a supervisory department and other principal departments to strengthen the national bank's supervision, commercial banks, and functions. At that time, NBC introduced a minimum capital requirement for banking institutions for ten billion riels (approximately 5 million US dollars).

- **Building Economic Market and Widen Banking System (1993-1998)**

Carrying out national consolidation, national wide free election arranged by United Nations brought a new environment for the whole people. The progress of the banking system walked in parallel with the economic development process. The growth of banking institution operation required NBC to intensify its management subsequently and essentially in banking supervision. The national assembly enacted a law on the organization and conduct of NBC in 1996 to improve the efficiency of NBC's operations and function as the guardian of the entire banking system to keep up price stability, develop the banking sector, maintain macro-economic resolution, and national economic development. Cambodian banking system transformed from mono-banking system to two-tier banking system and NBC stopped opening but maintaining public accounts in favor of opening accounts for the state, banks, financial institutions, international financial organizations and concentrating on its role as a guardian of the banking industry and keeping this role in providing financial services to financial institutions.

- **Development and Modernization Banking System (1999-Presence)**

After exploding the financial crisis in Asia in 1997-1998, the effect of calamity spread to Asia countries. In order to enhance and develop the banking system, the national assembly approved the banking and financial institutions law on November 18 1999 to manage depository institutions operating in Cambodia. During 2000, there were 30 banking institutions that contained experience and international standard skill banks and unqualified institutions. This reform required private financial organizations to apply for relicensing with a more robust minimum capital of 50 billion riels (approximately 12.5 million US dollars) and demanded that institutions organize and strengthen internal management structures to reduce risks. The process was successfully reformed. After this rectification, there were 15 banking institutions shut down which composed of 10 volunteers closing get liquidation with

insufficient capital and the other 5 banks forced to liquidate and repaid depositors. In 2011, NBC strengthened its structures and managed operation by transforming the supervision department to the banking supervision directorate-general. And also consolidate central bank operation to be more robust under directorate general of central banking and other existing dominant directorate generals.

NBC (2016) [12] addressed the improvement of the banking sector. In 2008, the minimum capital requirement of the commercial banks was increased to 150 billion riels. In 2016, raised additional capital for commercial banks to 300 billion riels, specialized banks to 60 billion riels, microfinance deposit-taking to 120 billion rile, and microfinance institutions to 6 billion riels. After that, in late 2017, the number of banking institutions increased to 39 commercial banks, 15 specialized banks, seven deposit-taking microfinance institutions, and 66 microfinance institutions. Anyway, banking institutions' assets rose to 109.2 trillion riels (around 27.3 billion US dollars) raised nearly five times, and assets of microfinance institutions comprised 18.8 billion riels (about 4.7 billion US dollars) increased almost ten times. More specifically, the banking sector's assets (including banking and micro-financial institutions) by semester 1 of 2017 escalated 41 times compared to 2001, 23 times compared to 2005, and 5 times compared to 2010.

On the other hand, over the last decade, NBC also modernized the payment system based on electronic technology to reduce operational costs with fast payment and safety. The study on the influence of using electronic cards indicated the more uses; the more payments have been increased (average 0.7%) as well as an increase in GDP (average 0.17%). The electronic payment systems have been developed consist of:

- The national currency electronic retail payment system (FAST) allowed the individual to receive immediate payment with a low service charge.
- Launched Cambodian Shared Switch System (CSSS) authorized ATM cardholders to withdraw money from other banks' ATMs.
- Real-Time Gross Settlement is being built in response to in-country developments and regimes, particularly for integrating into the Asian payment system.

Meanwhile, with the increase of demand for domestic currency, NBC also issued a Negotiable Certificate of Deposit in 2013 and launched the Liquidity Providing Collateralized Operation in 2016 (NBC, 2017)[13].

2.1.2. Definition of National Bank of Cambodia

According to article 1 of the law on the organization and the conduct of the National Bank of Cambodia (1996a) [14] determines the National Bank of Cambodia is the "Central Bank," which is the autonomous public organization of a commercial and industrial scale.

2.1.3. Functions and Duties of National Bank of Cambodia

NBC Law (1999b)[15], article 7 promulgated on January 26 1996, regulated the functions and duties of the national bank as the following:

- To determine the monetary policy goals, in discussion with the Royal Government and thought of the scheme of the economic and financial policy of the Kingdom of Cambodia;
- To formulate, implement and survey monetary and exchange policies aimed at the determined objectives;
- To regulate economic and monetary analysis, make public the results, and submit proposal and measures to the Royal Government;
- To license, de-license, control, supervise banks, private depository institutions, and other relevant establishments like auditors and liquidators.
- To oversee payment systems in the Kingdom and to advance interbank payments;
- To behave as the sole national currency issuer of the Kingdom;
- To take on and perform, on behalf of the Kingdom of Cambodia, businesses resulting from the joining of Cambodia in the public international organizations in the banking, loan, and monetary sector
- To construct the balance of payments;
- To join in the administration of external debt and assertion or claim;
- To participate in the establishment and surveillance of the money and financial markets
- To license, de-license, regulate and oversee all those processings in the security and FX markets, the market for precious stones and precious metals;
- To determine interest rates

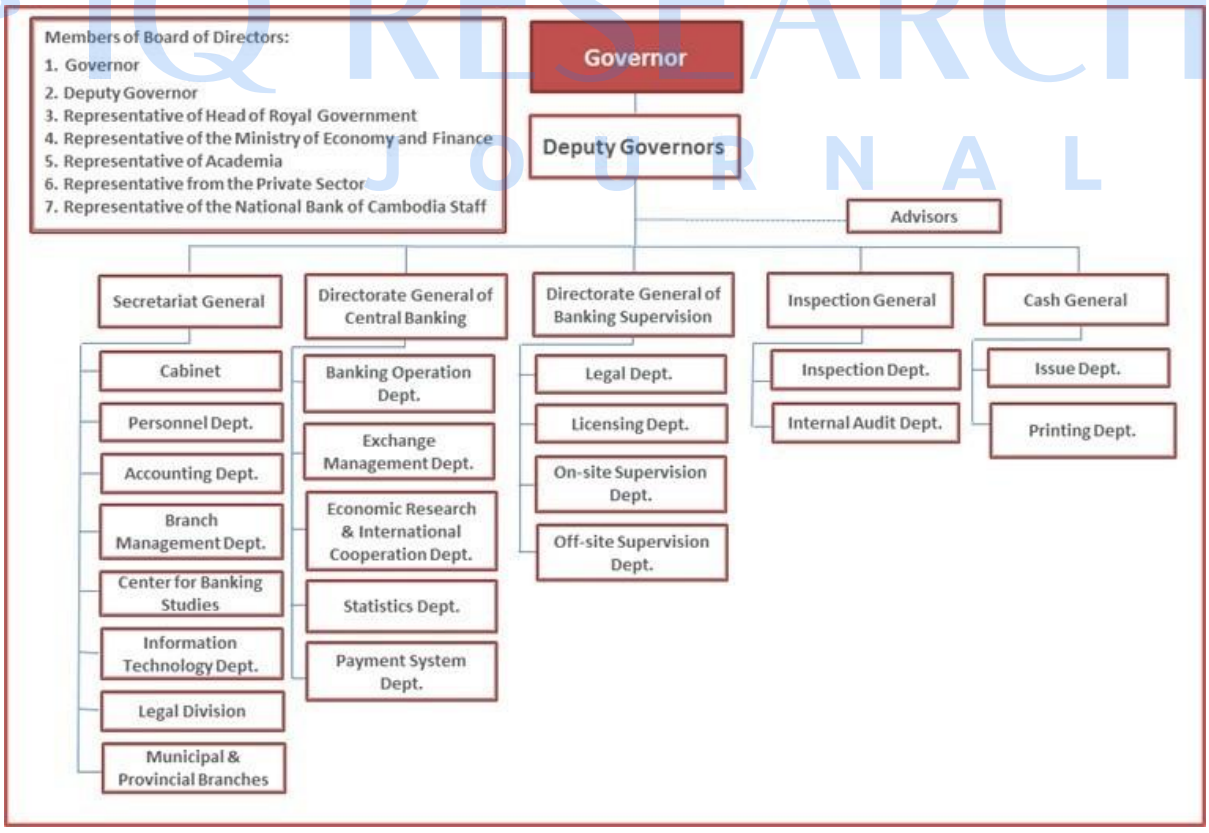
2.1.4. Goal of National Bank of Cambodia

The main mission of the NBC is to "determine and direct the monetary policy aimed at keeping price stability to facilitate economic development within the Kingdom's economic and financial policy framework"

2.1.5. Structure of National Bank of Cambodia

The handling organ of the national bank is the board of directors. The governor should be responsible for the Chairman of the board. The board members comprised of seven persons such as the bank governor, deputy bank governor, and five other members: one represents the head of the government, one represents the ministry of economy and finance, one represents the real economy, one represents an academic, and the last representing the national bank personnel. The governor and the vice governor shall not be a public servant, a member of the royal government, a person serving as adviser of a public entity, or a lower house member during their term of office.

Figure 1.1: Structure of National Bank of Cambodia



There is consist of five general directorates consist of (1) Secretariat General, (2) Directorate of General Central Banking, (3) Directorate of General Banking Supervision, (4) Inspection General, and (5) Cash General, and there are 20 departments and 19 official provincial branches in the national wide.

2.2. Literature Review

Dollarization will affect policy interventions to foster economic expansion in the country. Monetary instruments principally impact liquidity; heavily dollarization lessens the capacity of the national bank to manage this liquidity that could inflame consumer price inflation, in this incident, affect only shrinking share of national currency holdings. To make the right decision, we have to understand the concept, driver surges in dollarization, and its advantages and disadvantages for the economy as a whole.

2.2.1. Concepts and Definition of Dollarization

Many scholars have attempted to explain the concepts of dollarization in different ways. The ideas and the term of dollarization have evolved from the 1970s in Latin American countries (Myriam Quispe-Agnoli, 2002)[16]. The first literature on "currency substitution" was used to solve the demand for foreign currency by local economic agents. The first literature also describes the conditions under which diversified portfolios of domestic and foreign currency balances will keep and adapt to respond to expected changes in relative risks and returns among the various currencies. Tyler Maroney 2010 defines dollarization as: "The process by which a country abandons its currency, and to adopts the other foreign currency of a more stable country as its legal tender for conducting transactions. Even if the concept would provide invention about the U.S. dollar, the conversion to any foreign, stable currency, the European euro, the German mark, the Japanese yen, for example: usually known as dollarization" (2010,1). According to Baliño et al. (1999),[17] an economy is strongly dollarized if the fraction of foreign currency deposit to broad money is more than 30 percent. Many countries in Africa, including Angola, Albania, Armenia, Belarus, Costa Rica, Haiti, Honduras, Jamaica, Liberia, Maldives, Mongolia, Qatar, Romania, Mozambique, Tajikistan, Tanzania, Uganda, Ukraine, and Zambia, have their ratios over 30 percent.

Patricia and Alicia (2007)[18] have defined dollarization as held by a resident of an essential portion of their assets in the types of investments denominated in foreign currency. Berg

(2000)[19] explains dollarization as shorthand for any foreign currency by another country. There are two kinds of dollarization. *The first* is the official (de jure) dollarization, which refers to the case in which central banks adopt the US dollar or other country's currency as legal tender for all transactions. Significantly, the American dollar takes over all functions of domestic money: a unit of account, the medium of exchanges, and role as a store of value; for example, Argentina officially dollarized in the late 1990s, then as of late 2000 and on January 24, 2000 administrators of the United Nations addressed that for the time being, the dollar would be official currency for East Timor (Kurt, 2000)[20] and the Marshall Islands, Micronesia, Palau, Panama, Ecuador, El Salvador; Pitcairn Islands (New Zealand), Cocoa Islands (Great Britain), the British Virgin Islands (Great Britain); the USA territories: Guam, American Virgin Islands, Puerto Rico, American Samoa, the North Mariana Islands (Nikola, Danijela, 2004)[21]. *The second* is unofficial dollarization or De facto, which represents the circumstance of foreign banknotes being used together with the home currency as a means of exchange for transaction purposes and to allocate their financial assets (Levy Yeyat, 2006)[22]. Unofficial dollarization is a typical response to economic instability and high inflation. The demand of the citizen to diversify and to protect their assets from the risks of the devaluation of their currencies, including most of Latin America (explicitly Argentina, Bolivia, Central America, Peru, and Mexico), most of the Caribbean, most of the former Soviet Union (especially Azerbaijan, Armenia, Georgia, Ukraine, and Russia), Hong Kong, Mongolia, Mozambique, Romania, Turkey, Vietnam, and so on (Fabris, N. et al., 2004)[23].

Baliño, Bennett, and Borensztein (1999) consider an economy to be dollarized if the share of foreign currency deposits to broad money exceeds 30 percent. Alternatively, a country said to have "de-dollarized" if (1) its three-year average dollarization fraction has decreased by at least 20 percent and (2) the average proportion of foreign currency loans to total bank loans has not raised between these two three-year periods (Mecagni et al., 2015)[24].

Apart from the above mention, there are two essential motives for the demand for foreign currency assets: currency substitution and asset substitution. Therefore, it is supportive of isolating the difference between currency substitution and asset substitution. The differences between these two concepts depend on the economic reasons of agents for demanding foreign currency assets.

2.2.2. Currency Substitution

There are many alternative definitions and concepts of currency substitutions in the kinds of literature. Some scholars define currency substitution as replacing foreign currency with home currency in any or all the three essential functions of money. Moreover, others provide different definitions according to the money function by superseded. Most authors argue that currency substitute uses foreign assets as money, principally as a unit of account and medium of payment properties. Currency substitution favors adopting an inflationary situation because the high opportunity cost of holding national currency becomes so expensive that residents will make transactions using foreign banknotes. Even though the inflation rate declines, but a reversal is an adjacent.

According to Giovannini and Turtelboom (1994), cited by Özge Başkurt (2005a)[25], currency substitution is the close stand-in of one banknote with another, and currency substitutability is the procedure that one money shifts a substitute for another. It may occur at both domestic and universal levels. In other words, domestic currency substitution refers to dollarization (Savastano, 1996)[26]. Currency Substitution indicates when demand for foreign currency is reversible and non-reversible, reciprocally (Mueller, 1994)[27].

2.2.3. Asset Substitution

There are three types of dollarization based on their categories: payment dollarization, financial dollarization, and real dollarization. Payments dollarization is also used as currency substitution in the literature. As already illustrated, it is the utilization of foreign bills as a means of payment. The literature Nicolo, Honohan, and Ize (2003) [28] define financial dollarization as asset substitution. It uses foreign coinage to index deposits, credits, and any other financial intermediates. On the other hand, real dollarization is the use of foreign currency to index wages, prices, and actual contracts in the economy (Ize & Parrado, 2002)[29].

Asset substitution mainly refers to the rationing of portfolios in foreign currency-denominated assets. Specifically, the buck replaced the domestic currency as a standard of deferred payment and was observed in the financial system's circumstance of dollarized assets and liabilities. Using assets denominated in foreign currency allows local citizens to avoid the negative impact of macroeconomic vulnerabilities, inflation, and currency depreciation.

Asset substitution is as residents holding assets and liabilities denominated foreign currency, including non-bank assets like commercial papers or government debt (Levy-Yeyati, E. L., 2003)[30]. Additionally, Tase (2005)[31] writes that using a foreign currency as a unit of account or mean of payment is known as currency substitution. Also, asset substitution refers to its use as a standard of deferred payment. Luis (2004)[32] described a similar definition of financial asset substitution, concluding that the term refers to the extensive use of foreign banknotes to value assets and liabilities in the domestic financial system. Asset substitution can be either in the form of foreign borrowing or deposit dollarization. In foreign borrowing, domestic banks or local firms in the country borrow directly from abroad. In other words, in deposit dollarization, domestic asset holders have foreign currency denominated deposits locally. Cambodia is amongst the countries experiencing this type of financial dollarization or deposit dollarization in the 1990s. Furthermore, FD or Asset substitution is the use of dollars as a standard of deferred payment, and it is essential to understating the borrowing constraints (financial fragility and the modest and volatile growth) of countries without capital markets in their own banknotes, which are intensified to dollarize their liabilities and less tolerant of high levels of indebtedness and more exposed to fluctuations in the worldwide financial cycle (Levy-Yeyati, 2021)[33].

The below table 1.1 illustrates the ratio of foreign currency-denominated deposits to total deposits in the banking sector for the selected group from some countries in Asia and Latina America, Israel, and Russia. The country sample is divided into three types from low to very high dollarization. Hence, those nations are classified by the average dollarization ratio for the period between 1995-2004. It was showed that Cambodia was the most dollarized country in 1995 (92%), 1998 (93%), 1999 (92%), 2000 (93%), 2001 (95%), 2002 (94%), 2003 (95%) and in 2004 (96%) with average 94%; Bolivia which the ratio composes around 90% of total bank deposits in overseas currency deposits; and Uruguay contains 84%. Besides, the moderate dollarized countries comprised of Vietnam had approximately 37%, Russia about 34%, and the Philippines 31%. Countries with low dollarization contained Chile roughly 9%, China was almost 7%, Korea was generally about 3%, Malaysia was perhaps 3%, and Thailand was approximately 1% (Patricia and Alicia, 2008:7)[34].

Table 1.1: Degree of dollarization

	1990	1995	1998	1999	2000	2001	2002	2003	2004	Average 95-04
High Dollarization Degree										
Cambodia	..	92	93	92	93	95	94	95	96	94
Bolivia	82	78	92	93	92	92	92	93	87	90
Uruguay	86	79	79	81	82	85	88	89	88	84
Ecuador	13	19	37	54	100	100	100	100	100	76
Lao PDR	18	57	76	90	85	83	71	31	33	66
Peru	46	65	64	66	68	66	73	70	68	68
Argentina	47	57	58	62	65	74	1	2	4	40
Moderate Dollarization Degree										
Vietnam	..	35	37	39	40	42	39	30	30	37
Russia	..	29	44	41	37	34	35	27	28	34
Philippines	21	25	33	32	32	31	30	31	32	31
Indonesia	..	20	22	19	21	20	17	16	15	19
Israel	28	19	21	19	19	19	..	..	15	19
Low Dollarization Degree										
Chile	19	5	6	9	9	11	11	12	10	9
China	..	..	8	8	9	8	7	6	5	7
Korea	1	1	5	3	3	4	..	..	..	3
Malaysia	..	..	2	3	3	4	3	3	3	3
Thailand	0.1	0.3	1	1	1	1	..	..	..	1

When entrenched, dollarization is challenging to abolish. Public commemoration of macroeconomic instability and hyperinflation tends to remain for a long time, affecting the protection of foreign currency-denominated assets even during periods of macroeconomic stability. The literature illustrates that dollarization continues even when macroeconomic strength and credibility of government policies have been gained (Kokenyne, Ley, and Veyrune, 2010a)[35].

According to Ilchuk & Kots (2017),[36] count on the functions of foreign currency substitute and by the status and extent of foreign currency using, we can classify dollarization as the following:

Table 1.2: Types of Dollarization

Classification sign	Types of dollarization	The essence of dollarization
According to IMF methodology, based on the functions of	Payments Dollarization	Foreign currency is used primarily as means of payment
	Financial Dollarization	Residents form their foreign currency-denominated financial assets; it performs the conservation function and savings purchasing value.
foreign currency substitute	Real Dollarization	Price and wages are set in foreign currency, and express commodity prices and price proportions between goods.
By the status and extent of foreign currency using	Official (complete) dollarization	Foreign bill has the status of single legal tender for all transactions and performs all national currency functions. It cannot omit the national currency.
	Semi (mixed) dollarization	Foreign coinage is used together with home currency in monetary turnover. It serves as the mean of exchange and payment throughout the national currency's inflationary phase. In this situation, a government can implement national policy, but generally, it is ineffective.
	partial (Informal) dollarization	Foreign currency is used as an illegal payment medium but occupies a huge share of the monetary turnover (particularly in the processes of accumulating and borrowing).

2.3. Reasons of dollarization in general

Many reasons contribute to dollarization, but it is hard to differentiate which causes are the most effective. The researchers will review only some causes that exist in most countries in the globe. Dollarization is caused by the economy's weakness, the strength of the greenback as the world's currency, and the connection between interest rates and external currencies. The

changing trend of the domestic currency's exchange rate against the U.S. dollar is also a fundamental cause of the desire to accumulate and deposit in dollars. Morales (2003a) [37] states that the coarse thread in the dollarization of the economies, natural and financial, is the legacy of distrust in their domestic currencies because of extended periods of high and unstable inflations. The perception keeps that the same forces that repeatedly led to the exchange rate depreciation also drove prices up. According to Savastano (1996)[38] cited from Calvo and Végh (1992), in countries with high inflation, foreign currency is utilized as the function of a unit of account and a standard of deferred payment. On the report of these authors: "...of the three fundamental functions of money, this [store of value] is possibly the one in which home currency is the most vulnerable." When inflation rises, goods such as houses start to get quoted in foreign banknotes. For example, Chile, Colombia and Peru, also became dollarized after macroeconomic instability and high inflation periods, which caused the substitution of its domestic currency for the US dollar (Duma, 2010b)[39].

Diversely, expected inflation cannot be the only reason why savers may choose to hold their savings in other currencies. After all, financial assets allow interest rates. Also, as long as investors pay for the inflation premium, there should not be any reason to keep financial assets in other currencies. Calvo and Végh (1997), cited in Emre Ozsoz, Erick W. Rengifo (2010) [40], and Dominick Salvatore, argue that inflation should not affect portfolio choice as long as included in the nominal interest rates. In reality, the banks' interest-bearing financial assets have a high dollarization fraction like interest-bearing savings deposits. Suppose the actual returns are the same in national and foreign currency-denominated assets. In that case, there should not be any good reason for savers to hold their preservings in foreign currency-denominated investments (Rengifo, E. W., et al., 2013)[41]. Dollarization's leading cause is more excellent stability in the foreign currency's value over the domestic currency. More specifically, debt dollarization is guided by the extent of the firms and their exposure to overseas competition, based on just a case of Chilean companies (Tweneboah, G. et al., 2019)[42]. For a country with financial domination and capital controls like República Bolivariana, Nigeria, de Venezuela, and many other Sub-Saharan African countries became dollarized following policies that imposed capital controls and restrained financial transactions (Reinhart, Rogoff, and Savastano, 2003)[43]. Ecuador and Argentina replaced their domestic currencies for American dollars as a legal tender to cope with macroeconomic soundness and a long history of monetary and exchange rate policy (Berg and Borensztein,

2000)[44]. High inflation created incentives for economic agents not to get exposed to financial systems at long maturities. In the late 1980s, some economies of Latin America experienced hyperinflation. On that occasion, the stabilization efforts included strategies in which the role of the foreign currency in part to develop long-term instruments in promoting local financial markets (Rellana and Vesperoni, 2007)[45].

For example, in the case of Bolivia, after controlling the high inflation of the 1950s, dollarization continued with even more stimulus, notwithstanding that inflation was low throughout the entire decade of the sixties. Then, nearly all long-term contracts, loans, and others using in dollars. The increasing dependence of Bolivia on foreign exchangeable, either under the types of loans from the foreign development banks or foreign direct investment, was another factor. The loans were dealt with in dollars and serviced (Morales, 2003b, p.12)[46].

When institutional quality is low, or the government's credibility in fighting inflation is not good, the government may not convince debt holders that it will not inflate away the debt, as Calvo and Guidotti (1990) argued. In this case, the government may prefer to dollarize its debt obligations to commit to its low inflation program credibly. It is a costly alternative, but maybe the government's only option to overcome the inflation bias.

Kokenyne, Ley, and Veyrune (2010b)[47] argue that dollarization was challenging to eliminate or reduce. Simultaneously, macroeconomic frailty and hyperinflation appeared to persist in the long period, causing foreign currency-denominated evaluation to be maintained even during periods of macroeconomic certainty. Scholars define that dollarization remains even when government policies accomplish macroeconomic steadiness and credibility. Dollarization measures as the holding of financial institutions in FX assets and liabilities. The dollarization of financial sector assets is evaluated by quantifying the loans awarded by the local financial sector to households and non-financial corporations. The dollarization's financial sector liability is directed as the proportion in the total foreign currency liabilities and debt issued by depository institutions. In these countries, narrow financial systems and the nonappearance of savings and financial instruments compel investors to keep their monetary savings in the greenback. Due to data limitations, non-financial sector dollarization measured and often omitted circulation of foreign currency as well.

Generally, dollarization progresses when the home currency performs its notable functions poorly compared to other accessible currencies. The main parts of money are the means of

payment, the standard of deferred payment, and a unit of account. The hapless performance of local currency in these functions leads to the advancement of various forms of dollarization; For instance, currency substitution establishes if the home currency does not function properly as a means of payment. Due to a high and volatile inflation rate, real exchange rate instability would inspire residents to denominate contracts in multiple currencies to ensure more stable purchasing power in terms of local consumption and foster financial dollarization (Ize, Levy, and Yeyati, 2005)[48]. Another reason for dollarization can base on the incomplete market on a domestic scale (Caballero and Krishnamurthy 2003)[49]. In countries with financial restrictions, national currency denominated external debt would operate as insurance against natural exchange rate shocks. Still, when there is a low level of savings in national currency, denominated assets of relatively low maturity. It encourages borrowing in U.S. dollars as a substitute and causes dollarization of liabilities for the economy.

An additional motive of dollarization is the weak financial systems are causing a rise in the claim for foreign currency tools. They went on to say that dollarization is one method by which economic agents seek refuge in foreign currencies to protect their capital (Tweneboah, G. et al., 2019)[50]. As an illustration, the borrowing abroad in foreign currency: In Uruguay, the asset dollarization started due to chronic inflation and the country's lack of peso-denominated financial alternatives. The inflation process that began in the 1950s diminished the confidence of the national currency population. Simultaneously, interest rate ceilings and the lack of inflation-indexed assets forced savings out of home currency and into dollar-denominated assets (Licandro and Licandro, 2003)[51].

Even in economies that developed an acceptable alternative to the dollar, dollarization had its way whenever there were no explicit bans on dollar-denominated assets. The portfolio approach is also one main reason that contributed to dollarization. The stochastic properties of liabilities and assets are vital to the increase in dollarization. The incompetence to foresee a sharp and notable impairment of the exchange rate makes debtors adopt excessive foreign exchange risks and induce creditors to provide foreign currency loans. In addition, the considerable gap between interest rates, which favors foreign currencies, can result – through the adverse section - in that riskier projects will concentrate on the segment of unhedged borrowers (Demidenko, 2017)[52].

2.4. Advantages and Disadvantages of Dollarization

A circumstance in which citizens choose to conduct transactions in a multi-currency rather than their own domestic currency is considered dollarization. So, we will find some of the positive and negative results of the dollarized economy below.

2.4.1. Advantages of Dollarization

Dollarization might also serve as a solid foundation for a healthy banking sector and entails more than just switching to a new currency. It also involves financial integration with the united states and the rest of the globe, which will push domestic financial institutions to enhance their efficacy and crucial service quality.

Typically, de facto dollarization occurs when the foreign currency is not the legal tender (M. R. M. et al., 2018) [53]. Still, it partially replaces the national money as a standard of deferred payment, a unit of account, and a payment medium. Dollarization is anticipated to enhance macroeconomic steadiness by resolving the credibility problem when a reserve bank cannot pre-commit itself to a shallow inflation rate. As suggested by cross-country experience, using trusted foreign currencies like the US dollar has helped dollarized economies to manage price instability effectively. Many countries have adopted full dollarization to stabilize their economies, including El Salvador, Ecuador, Marshall Islands Micronesia, and Timor-Leste. For example, CLMV (Cambodia, Laos, Myanmar, and Vietnam) have encircled partial dollarization to restore economic and sustain pricing stability (Sathit, 2019)[54].

As assigning to Bennett (1999a) [55] argues that allowing FCD in the domestic financial system increases the possibility of re-intermediation in economies with hyperinflationary periods and unstable macroeconomic conditions, during which representatives may have been unwilling to hold deposits within the banking system. With a restoration of stability, there is a good chance that trust will be re-instated. Gradually, FCD availability can accelerate this process to the magnitude that agents may be more willing to return to local intermediaries if they can keep dollar-denominated assets.

In addition, dollarization will donate to stability and integration for the economy. High degrees of inflation develop in negative consequences, including loss of acquisitive power, deprivation of savings, a rise of interest rates, and destruction of competitiveness. In 2000, Gustavo José Joaquín Noboa Bejarano served as the 42nd president of Ecuador and ratified the

dollarization policy to boost economic stability. Dollarization was attempted at first in Ecuador as a measure to diminish the country's high inflation rates. The annual inflation rate dropped sharply after dollarization, from 96 percent in 2000 to 20 percent in 2004 before stabilizing under 5% in the following year (Vásquez, 2018)[56]. Not surprisingly, the benefit of dollarization is that the source of the crisis is removed for a country involving a currency crisis. This risk is tremendously reduced for countries vulnerable to the currency crisis, although such risk remains positive. The fundamental goals of dollarizing El Salvador and Ecuador's economies were to achieve more excellent overall economic stability and closer integration with the united states economy. Also, the benefit to the economy's dollarization is the complete elimination of the feasibility of a currency crisis, Israel's case, between 1998 and 2002 - a sharp devaluation of the Shekel. With dollarization, Israel would avoid any probability or possibility of a further crisis of this sort (situation caused by the sudden outflow of speculative external currency) and constitute a stable environment conducive to growth (Plocker, 2005)[57].

Countries with a weak currency and a low or inexistent medium to the long-term local market of currency-denominated credit will deepen their financial system. Hausmann (1999) [58], cited from Curutche (2001:12), argues that borrowers in this country would suffer financial fragility either because of maturity mismatches or currency mismatches. The fragility appears when companies or governments want to finance their long-term investments, often paying back in home currency with a credit. In this situation, they can either invest their long-term assets with short-term investments and periodically renew their loans.

According to Uzin (2005) [59], credit dollarization guides a currency risk redistribution that can potentially stabilize. Dollar loans transfer currency risk from banks to firms, thus incentivizing them to enhance their risk management skills and enlarge their hedging activities. And it will reduce the risk of default if banks concentrate the majority of their dollar loans on creditworthy businesses with a principal revenue stream in dollars.

2.4.2. Disadvantages of Dollarization

The most considerable disadvantage of dollarization is the poor monetary policy of the central bank. There is also a cost of losing adaptability in monetary and exchange rate policy. The authority cannot depreciate the currency or cover a shortfall in the budget by inflating a dollarized financial system because it can not print the money (Bogetic, 2000)[60].

Unofficial dollarization makes the demand for national currency unstable. Hence, the reserve bank may face an obstacle in changing investors' portfolio preferences in home currency over foreign currency. Additionally, “instability influence on the demand for money" may create a "stability influence on the banking” (Yilmaz, 2005)[61].

Anyway, policymakers should care about euroization as it turns down the effectiveness of monetary policy and makes the transmission of monetary influence to the real economy more complex than it would be the case otherwise. In the absence of a national currency, a country's central bank losses its ability to set interest rates and employ other policy actions to mitigate the effects of economic recession. The government cannot devalue another country's currency to stimulate demand for its exported goods and services. Suppose that the dollarized economy is countercyclical to the United States. In that case, monetary policy changes in the United States could be harmful to the dollarized economy (Karnovitz et al., 2010)[62].

The government loses another source of costs and the capacity to infuse liquidity into the financial system in the case of a banking crisis through money creation because the reserve bank cannot perform as the lender of last resort. Therefore, dollarization does not vitally mean the loss of a lender of last resort but merely the disappearance of one particular source of liquidity, namely central bank credit. In dollarized economies, there is no choice for the reserve bank to behave as a last resort lender if systematic problems in the banking system occur. 13 Latin American countries revealed that a banking system crisis in a dollarized economy lasts longer than countries that use a home currency. Until now, no central bank would stand back in the position of a major banking crisis. It is most likely that it would attempt to support the banking sector with primarily issued loans, which would likely lead to a lower or a higher inflation rate that would partially devalue home currency deposits. Thus, reducing the actual burden of the banking system debt (Fabris, 2004)[63]. Specifically, central banks are willing to perform as a last resort lender to avoid the harmful effects of bank runs on output and employees. It obstructs the ability of a reserve bank to behave as a lender of last resort when a country's economy is dollarized because it loses its ability to print banknotes (Curuntchet, 2001)[64].

Aside from that, another disadvantage of dollarization is the loss of seigniorage. Seigniorage is the revenue made by a government from issuing currency; we use the income from the gap between the face value of banknotes and their production costs to finance the budget deficit.

The cost could be as much as 4-5 percent of the gross domestic product (Yap, 2001)[65]. For example, if the cost of printing a Rs 500 note in India is Rs 2, then Rs 498 is the income made on the banknote production, then banks earn this profit by placing the money into circulation. The government would lose some seigniorage with partial dollarization, but it was not as much as it would under full dollarization. The replacement of domestic currency by foreign currency in transactions limits the government's revenue for printing nation money (Agnoli, 2002)[66].

On the negative side, the banking system's rapid rise of dollar-denominated operations would increase the likelihood of domestic short-run foreign exchange liabilities in the kind of the expansion in required funds. Banks may cause a return of flight capital and boost the riskiness of the loan investment of the local banks. Banks would be sensitive to fluctuating capital movements if maturity mismatches between their assets and obligations in foreign bills. For instance, the withdrawal of short-term dollar credits from banks imposed by Mexican authorities made large dollar loans to the banking sector in the mid-1990s (Bennet, 1999b)[67].

Calvo and Reinhart (2000)[68] report partial dollarization boosts the cost of exchange rate volatility, which in turn causes the reserve bank to be involved in the FX markets to avoid a swing in the nominal exchange rate. In reality, as the cases of the Philippines, El Salvador, Egypt, and Venezuela attest. Under other conditions, currency mismatches in substantial depreciation are the principal source of solvency risk for dollarized financial institutions. The availability of domestic currency loans is not sufficient to meet the need of clients in the nontradable sectors whose cash flow is in local currency (Gulde, 2004)[69].

Finally, Cohen (2007a) [70] states that because a home currency was a symbol of a sovereign government, using foreign currency instead of national currency may harm a country's feeling of dignity. Moreover, the political, not economic, consequences of dollarization include the loss of a potent symbol of national identity, an emergency source of state funding, and an essential degree of diplomatic isolation.

2.5. Measuring the Unofficial Dollarization

Complexity to measure dollarization comes in the case of partial dollarization. It results in a lack of confidence from the public in home currency; the consequence is due to the refusal of the government to support reforms that would help improve domestic currency stability

(Honig, 2009)[71]. However, measuring the extent of dollarization is not easy. Nonetheless, the IMF and other interested international organizations consider a standard metric based on foreign currency deposits to broaden money in the economy, known as the dollarization index (Musoke, 2017:4)[72]. Dollarization has many forms reflecting the economy of a country, like in the black market. Therefore, other standard measures are also applied (Mengesha & Holmes, 2015)[73]. In the case of Somalia, it is even more challenging to measure the level of unofficial dollarization using the Dollarization Index. Many people prefer not to keep their hard currency in banks due to the country's informal economic system, low literacy rate, or the suffering of the civil war outbreak in the early 1990s, which caused all banks to collapse.

Greenbacks in circulation and deposits kept by residents in domestic banks. Also, offshore depository accounts maintained by domestic inhabitants are all indicators of unofficial dollarization. The DI is the most generally used indicator of dollarization and represents the portion of foreign currency deposits to broad money (M2). Currently, FCD is considered an approximate total of multiple currency holdings (foreign currency in circulation, time deposits, demand deposits, and offshore) held by domestic residents (Clements & Schwartz, 1993, Yinusa, 2008)[74].

Zoryan (2005)[75] argues that there are several measures of dollarization in the economy with partial dollarization. We use the following definitions from Feige and colleagues (2000).

BM = DCC + DDD + DTD + FCD (1);

Where BM : is broad money,

DCC : is domestic currency in circulation,

DDD : is dram demand deposits, DTD is dram time and savings deposits, and

FCD : is foreign currency deposits

EBM : BM + FCC (2);

Where EBM : is the effective broad money stock and includes FCC, foreign currency in circulation.

NM = DCC + DDD (3);

Where NM : is the narrow money stock and excludes any foreign currency.

ENM = NM + FCC (4);

Where ENM : is the effective narrow money supply and includes foreign currency cash.

Finally, **QM** = DTD + FCC (5);

Where Q.M : is quasi money. Under this definition of Q.M., foreign currency in circulation has appeared as a form of asset substitution.

We exclude the standard definition of money stock because it is challenging to measure foreign currency in circulation. However, in countries with heavy dollarization, foreign currency serves as a unit of account, store of value, and a circulating payment medium. Due to the shortage of data on FCC, research on the currency substitution process put pressure to accept FCD as a proxy for dollarization. The IMF's fundamental dollarization index (DI) is DI = FCD/BM (6). However, in countries like Armenia with heavy levels of dollarization, the exclusion of FCC biases descending all measures of currency substitute. Feige (2002) defines the Unofficial Dollarization Index (UDI) as a fraction of foreign monetary assets in effective money supply: UDI = (FCC + FCD) / EBM (7) a different measure of multi-currencies in the Asset Substitution Index (ASI): ASI = FCD / (DDD + QM) (8). ASI is helpful when dollarization principally takes the sorts of asset substitution in the country. Further, it uses foreign currency slightly or entirely as a unit of account and medium of exchange, so the Currency Substitution Index (CSI) is a perfect measurement of dollarization. CSI = FCC / (FCC + DCC) (9). Similarly, according to (Feige et al., 2002),[76] cited from Calvo and Végh, 1992 assures that "In the final analysis, the relevance of currency substitution is an empirical issue…. The study of currency substitution faces an elementary problem at the practical level: there is usually no data available on foreign currency circulating in an economy. Therefore the importance of currency substitution is unobservable".

2.6. Monetary Policy

We can express monetary policy as a deliberate effort by the monetary authority to supervise the money stock and the credit environment to accomplish specific economic objectives. The productivity of monetary policy in achieving its target objectives relies on the operating

economic situation, the institutional framework adopted, and the option and mix of the tools used.

2.6.1. Definition of Monetary Policy

In agreement with European Central Bank (2021),[77] assigned monetary policy is the decisions made by central banks to impact money's cost and availability in a given economy. The most crucial judgment made by the European Central Bank in this regard is usually related to actual interest rates in the euro area. Changes in these rates impact the interest rates that private banks charge their customers when they borrow money. Differently, the decision has an influence on consumer spending as well as a business investment. The goal of monetary policy is to retain price stability, i.e., preserve inflation at 2% over the medium term. As a result, it can better support European Union economic policies aimed at the full occupation and economic growth.

Furthermore, the Reserve Bank of Australia (2019) [78] copes with monetary policy to determine the interest rate of the overnight loan in the money market (the cash rate). The rate of cash influences other interest rates in the economy, affecting borrowers' and lenders' behaviors, economic activity, and inflation rate. The Australian Central Bank must uphold price stability, full employment, and people's economic prosperity and welfare in determining monetary policy.

To achieve these statutory goals, the bank has an inflation target and seeks to maintain consumer price inflation in the economy to 2-3 percent, on average, over the medium term. Controlling inflation can preserve money's value and encourage sustainable and robust economic growth over a more extended period.

2.6.2. Objectives of Monetary Policy

Depending on the Federal Reserve System (2019)[79] explains that the Federal Reserve Act's declared objectives are to promote (1) maximum employment, which means that all Americans who choose to work are employed, and (2) stable prices for all products and services purchased. In this way, the Federal Reserve's monetary policy judgments genuinely impact all people in the financial lives of the United States. It is not just our spending decisions as consumers, but also business spending decisions about what they produce, how many workers they employ, and what investments they make in their operations.

Moreover, the objective of monetary policy is described in detail by BND (2020)[80] as the following: whatever sort of monetary policy is employed and always linked to one of the three goals listed below:

- Manage inflation: The majority of economists believe that this is the only proper purpose of monetary policy. Low inflation is broadly the most beneficial to a healthy, thriving economy. When inflation starts to rise, the reserve bank may modify the monetary policy to bring it down.
- Reduce unemployment: Unemployment rates tend to rise during depressions and recessions. Any other way, monetary policies can play an important role in implementing unemployment policies and lowering unemployment rates. In contrast, there may be no way to accomplish actual full employment. Generally, low inflation is the most helpful to a healthy, robust economy. Thus, when inflation rises, the national bank may adjust monetary policy to lower the unemployment rate among those ready and willing to work for the existing wages.
- Balance currency exchange rates: Because stable exchange rates are so important in international trade, it's critical to discover measures to keep them balanced. Central banks regulate exchange rates between foreign and domestic currencies. Local currency will become cheaper than foreign currencies if the monetary authority decides to issue additional currency to boost the money supply.

Further, The Bank of Indonesia's goal is to accomplish and maintain the stability of the home currency, the rupiah. The principal objective of the Bank of Negara Malaysia is to retain monetary and financial strength to support the growth of the economy. Together with the final goal of the Monetary Authority of Singapore, is still price stability conducive to the continual development of the economy. Also, the Bank Of Thailand’s objectives is maintaining monetary certainty, system strength of financial institutions, and payment systems' stability (Molnár et al., 2020)[81].

2.6.3. Monetary Policy Instruments

In reality, monetary policy is the policy carried out by the monetary authority to manage either the interest rate on very short-term borrowing or money stock, which is often the target inflation or the interest rate to assure the stability of price and gain general trust. Generally,

the central bank uses three fundamental instruments in regulating the money supply: open-market operations, the discount rate, and reserve requirements.

2.6.3.1. Open Market Operation

As claimed by (Encyclopedia Britannica, 2019) [82] outlines the open market operation, which refers to any of the research bank's procurement of government securities and, in some cases, commercial papers to support a constant level of money supply and credit conditions. Once the central bank purchases securities on the open market operation, there will be consequences as follow (1) increasing the reserves of commercial banks, a basis on which they can enlarge their loans and investment; (2) increasing the price of government securities; equivalent to reducing the interest rate; and (3) decreasing interest rate in general, thus encouraging business investment. If the central bank sold securities; as a result, the effects would be reversed.; open market operations are customarily carried out with short-term government security (usually treasury bills). Observes disagree on the advisability of such policy. The supporters trust that solving with both short-term and long-term securities would distort the interest rate structure. Thus, the allocation of credit opponents would be wholly suitable because the interest rates on long-term securities directly influence the activity of long-run investment, which is responsible for fluctuation in employment and income.

On the report of (BOT 2010)[83], conducting open market operations, the Bank Of Thailand undertakes transactions in the financial markets by selling or purchasing financial instruments to absorb or inject liquidity available to the banking system. The BOT employs four types of open market operations as follows:

- Bilateral repurchase operations: To temporarily boost or drain reserves available to the banking system, the BOT conducts bilateral repurchase or reverse repurchase operations. The transaction entails acquiring or selling public sector debt securities intending to reverse the transaction later and price using debt securities as collateral. The loan amount plus interest would be the buyback/reverse repurchase price.
- Issuance of Bank of Thailand Bills and Bonds: The BOT has been issuing BOT bills and bonds since 2003 to increase the number of monetary instruments available for absorbing structural liquidity surplus in the banking sector. It also helps the development of Thailand's debt securities market by increasing liquidity and efficiency.

- Foreign exchange swap transactions: The BOT uses a foreign exchange swap (FX swap) operation as an additional tool to absorb liquidity in the banking sector. The FX swap is similar to the Bilateral Repurchase Agreement (BRP), except that instead of domestic debt currency, the Thai baht is exchanged for foreign currency (US dollar). When the amount of available collateral for BRP activities is restricted, FX swaps help the BOT manage its liquidity.
- Outright purchase/sale of public sector debt securities: The BOT can permanently infuse or absorb liquidity into the banking system by outright purchasing or selling public sector debt assets. Even if eligible securities contain all types of public debt securities, the BOT primarily conducts outright purchase operations on government and BOT bonds.

2.6.3.2. Discount Window

Banks like to borrow funds from other banks since the interest rates are lower, and the loans do not demand collateral. For this reason, discount window borrowing jumps during the event of economy-wide distress when all banks are under some form of liquidity constraint. The Federal Reserve (2021) [84] opinion defines the discount window as critical to the liquidity and stability of the financial system and the effective implementation of monetary policy. By providing quick access to cash, the discount window aids depository institutions in effectively managing their liquidity risks and avoiding actions that negatively impact their clients, just for withdrawing credit during times of market stress. Depository institutions can also get discount window credit from their local Federal Reserve Bank in one of three ways, as detailed below:

- Primary credit is a loan program that provides proper liquidity and serves as a constitutional safety value in the banking system. It is available to depository institutions in a commonly healthy financial position, and funds gained through primary credit can be used in any way. It assists depository institutions in meeting short-term financial requirements for up to 90 days.
- Secondary credit. Institutions that are not qualified for primary credit might apply for similar loans. It extends at a greater rate than the primary credit rate for a concise period, usually overnight. The usage of secondary credit extensions is subject to restrictions. It can be utilized to meet emergency liquidity demands if used in

conjunction with the debtor's rapid return to market-based funding or the orderly resolution of a problematic institution.

- Seasonal Credit is a loan program for small depository institutions with seasonal liquidity pressures, but it is not ordinarily available to banks with $500 million or greater deposits. Construction, college, agricultural, resort, municipal finance, and other seasonal forms of the company may be qualified for a term of up to nine months of seasonal funding, with the interest rate applied to seasonal credit fluctuating according to market rates.

As the last resort lender, CBN or The Central Bank of Kenya (2021)[85] contributes secured loans to private commercial banks on an overnight basis at a penal rate referred to as the discount window or standing facility. The penal rate restricts banks from seeking funding in the market, only resorting to central bank funds as a final solution. This instrument acts as a safety valve in relieving pressure in the reserve market by providing a short-term loan to depository institutions suffering liquidity pressures and ensures the basic stability of the integrated payment system by granting liquidity during the time of economic stress.

2.6.3.3. Required Reserves

It refers to the number of funds banks must keep on deposit in accounts with the central bank. Required reserves ratio is the fraction of deposits that regulators require a bank to hold in reserves and not loan out. Required reserve base may be composed of all funding sources (deposits, loans, and securities) or a part of them (e.g., deposits only). It might be consistent or differentiated depending on the maturity and currency structure of the funding sources. The central bank can reduce or increase commercial banks' lending potential by adjusting reserve ratios and infusing new liquidity. The required reserve ratio restricts bank credit potential rather than bank liquidity in market economies (National Bank of Serbia, 2019)[86].

Central banks can set differential reserve ratios based on the maturity and currency denomination of the regulated obligations. Reserve requirements have also been employed in numerous developing market economies to control credit and liquidity in a countercyclical manner. A considerable body of recent empirical data demonstrates that reserve requirements have shown to be quite effective during periods of large capital inflows caused by external factors. The primary reason is that interest rate policy may not be sufficient to reconcile competing goals. When faced with high capital inflows, a central bank may focus on price

stability while limiting domestic credit expansion. However, raising the policy rate may achieve price stability; it may also attract more significant capital inflows, amplify the credit cycle, and cause the domestic currency to appreciate.

According to Brei and Moreno (2018)[87], citing Bianchi (2011), capital and reserve requirements might have similar macroprudential impacts such as acting as a tax, raising borrowing costs, and reducing the likelihood and negative externalities of excessive credit growth. Based on the country and period, required reserves supported at least three crucial policy objectives: reduce bank liquidity and solvency risks, modifying market rate, controlling monetary aggregates, and govern system-wide liquidity. It ensures that banks maintain sufficient liquidity to cope with unexpected withdrawals of reservable liabilities such as deposits or short-term funds and help resolve the policy dilemma posted by capital flows. The National Bank of Tajikistan (2010)[88] uses differentiated interest rates on required reserves for national and foreign currency deposits. The minimum reserve requirements ratio for domestic currency deposits is 3.0 percent, while foreign currency deposits are 9.0 percent as of 2010. The level is determined using the bank's balance statement before the start of the maintenance. In the euro area, banks must hold a certain amount of funds as reserves in their current account at their national central bank. There are called minimum or required reserves. As declared by Educba (2021)[89] describes more details on the advantages and disadvantages of reserve requirements as below.

- Advantages of reserve requirements ○ It has a similar impact on all financial organizations. It also has a significant effect on the money supply ○ It ensures that the economy has a large quantity of liquidity
    - It enables banking organizations to make more money by maximizing lending opportunities
    - It ensures that depositors are informed of their bank's financial performance and, at any given time, if they are coping with lower margins
    - It promotes the free flow of money in the economy, which aids in the management of total liquidity
    - It increases the purchasing power of money by encouraging banking institutions to invest in government securities
- Disadvantages of reserve requirements ○ Reserve requirements are unrealistic to some extent because even minor changes in the minimum cash-reserve ratio could result in

significant changes in the supply of money. For banking organizations, the result of this impracticality could be pretty costly.

- Liquidity issues: Banking institutions with low excess reserves may have liquidity issues due to maintaining accounts.

2.6.3.4. Foreign Exchange Market Intervention

FX market intervention or currency intervention (currency manipulation) is a monetary policy operation. The national bank buys or sells foreign currency in exchange for its domestic currency, affecting the exchange rate policy. Policymakers may intervene in foreign exchange markets to achieve a variety of economic objectives, including inflation control, maintaining competitiveness, and financial stability. The particular objectives will, among other things, be determined by the economic stage of a country, the degree of financial market development and intention integration, and the country's overall sensitivity to shocks.

For most industrial economies, the exchange rate does not enter into policymakers' decisions above the impact on expected inflation. By contrast, in emerging market countries, the exchange rate can also play an important role in countries with currency boards or explicit exchange rate goals and those targeting inflation. There are several key factors; the impact of exchange rate movements on domestic inflation, source of shocks, credibility, capital flows' volatility, and financial and structural reforms (Jeffery et al., 2005, p.8)[90].

The Bank of Japan (2020)[91] defines foreign exchange intervention as the buying and selling currencies; it requires Japanese Yen and US dollars. When buying US dollars against the yen in the multi-currency market in reaction to a sharp rise (appreciation) of the yen, the yen funds to be sold are raised by issuing financing bills. When FX intervention is carried out by selling the American dollar against the yen in the FX market in reaction to a severe decrease in the Yen, US dollar funds stored in the Foreign Exchange Fund Special Accounts (FEFSA) are used to buy yen.

Martin (2020) [92] argues that Sterilized is an official intervention when monetary authority simultaneously or with a concise lag-take action to offset or “sterilize” the effect of an alteration in official foreign asset possessions on the domestic monetary base. On the other hand, no sterilized intervention happens when authorities acquire or trade foreign exchange, commonly against their currency, without such offsetting actions.

Most central banks nowadays are targeting inflation but also take enormous concern of the drive of FX rate. It is particularly present in heavily dollarized countries where the exchange rate's high pass-through effect on inflation is high. For example, assumed that the depreciation of the domestic currency spills faster on the inflation rate. In this case, there should be a combination between intervention and conducting monetary policy (Mohanty and Turner, 2005)[93].

2.6.3.5. Repurchase Agreement (Repo)

Genuinely, the central bank formulates and implements monetary policies to control the money supply in the economy and stimulate various aspects of economic growth through price stability, regulation of bank credit volume, financial system efficiency, investment promotion, and increasing financial instrument diversification in financial markets. In this position, repo rate and reverse rate are instruments of monetary policy that can help control the economy's money supply.

A repurchase agreement entails obtaining immediately available funds through the sale of securities, as well as a commitment at the same time to repurchase the same securities at a specified price, plus interest or equivalent at an agreed-upon rate, on a determined date within one year. The underlying financial assets (securities) assist as collateral in a repo transaction, with several secured loan arrangement characteristics. In this respect, the sale of securities under a buyback agreement is a form of collateralized borrowing. It refers to the seller's contractual obligation to transfer funds to the buyer on the agreement's final maturity date (Lumpkin, 1987)[94].

Securities are exchanged for cash with the promise of later repurchase in repurchase agreement markets. Sovereign debt instruments are the most typically utilized as collateral in Repos, followed by private sector debt instruments, including commercial paper and mortgage-backed securities in the United States. Repo transactions may be of any maturity, but generally short, between overnight and one year. Risk in repo markets arises mainly from volatility in the collateral value, which can open up a credit exposure and the risk of counterparty default. The principal merit of REPOs is the generally lower cost of financing relative to the uncollateralized market (BIS, 1999)[95].

Reverse Repurchase Agreement or Reverse Repo: According to Paisebazaar (2019) [96], the reverse repurchase agreement is the rate at which a central bank obtains funds from all other commercial banks in the country. In specific, it is the rate at which commercial banks deposit excess cash with the central bank for a short period.

Referring to (MyLoanCare, 2021)[97] compares significant differences between the Repo rate and Reverse Repo rate.

Parameters	**Repo Rate**	**Reverse Repo Rate**
Meaning	The rate at which the central banks grants loan to the commercial banks against government securities	The interest rate offered by RBI to banks that deposit funds with them
Rate of Interest	Higher than the reverse repo rate	Lower than the repo rate
Mechanism of operation	RBI grants funds to commercial banks against government securities	Commercial banks deposit their excess funds with RBI and receive interest on their deposits.
Controls	Inflation	Money supply in the economy
Purpose	To fulfill the deficiency of funds	To ensure liquidity in the economy
Borrower's objectives	To manage short term deficiency of funds	To reduce the overall supply of money in the economy
Impact of higher rate	Cost of funds increase for commercial banks, and hence loans become expensive	Money supply in the economy decreases as commercial banks park more surplus funds with RBI
Impact of the lower rate	Cost of funds reduced for commercial banks and loans become cheaper for them	Money supply increase in the economy as banks lend more and reduce their deposits with the central bank
Charged on	Repo rate is charged on the Repurchase Agreement	The reverse repo rate is charged on the Reverse Repurchase Agreement
Current rate	4.00%	3.35%

- Significance rate of repo and reverse repo ○ Liquidity regulation: Many facilities are available to commercial banks under the central bank's liquidity framework to address their immediate liquidity requirements for the fund deficit and avoid a liquidity crisis in the banking sector.
  - ○ Price stability: By changing the repo rate half-yearly or quarterly, the central bank can manage inflation, boost economic growth, and strike a balance between inflation and economic expansion. It is critical to avoid a rise in the inflation rate of a country.

2.7. Monetary policy and dollarization

We will adequately clarify the relationship between de facto dollarization and monetary policy. Before considering why monetary policymakers should be concerned with partial dollarization, it is essential to discuss what central banks should do in general and how current monetary policy should be implemented, especially in emerging market economies.

Some governments have gone even further and outsourced monetary policy to other countries, such as Zimbabwe; the acting finance minister stated in 2008 that the greenback would be accepted as legal tender for a limited number of enterprises for an 18-month trial period. Following the experiment, the finance minister stated that the country would eventually adopt the US dollar as legal tender to replace the Zimbabwe dollar. And Panama was also one of the largest countries accepting the dollar as its legal tender (Goldfajn et al., 2001)[98].

It is not surprising many news and media are talking about monetary policy nowadays. Monetary policy is relatively young, and the media are constantly speculating on future policy movements. It's breaking news in developing countries, where the very health of the economy appears to be contingent on the settlement of currency and banking issues. Since they define the financial system in the world by freely floating exchange rates and unrestrained capital flowed ten to fifteen years ago, two "stylized facts" have evolved. First, compared to prior regimes with varied fixed exchange rates, the volatility of actual exchange rates has increased dramatically under floating exchange rates. Second, the size and volatility of international capital flows have often made a fixed but adjustable exchange rate pegs hard to continue. Time-inconsistency, together with the lack of reliability of monetary policy, has been the

factor that contributed the most to the dollarization in many countries in Latin American, such as Ecuador and El Salvador (Kydland and Prescott 1977 and Calvo 1978)[99].

The sharp depreciation of national currencies against the dollar provided another reason to invest in assets denominated in dollars rather than the local currency. José Antonio Licandro and Gerardo Licandro (2003)[100] report that dollarization of debt is a way to fight disbelief in monetary policy and console the public of the policymakers' commitment to inflation stabilization, such as the case of Uruguay and Argentina.

On the other hand, Pinshi (2020)[101] reports dollarization caused by a drop in the value of the domestic currency and a depreciation in the exchange rate. The volatility of inflation was exposed by reduced commodity prices, like in the Democratic Republic of Congo, where inflation exploded to 54.7 percent in 2017, owing primarily to a 23 percent depreciation of the currency. This shock intensified the decline in foreign exchange reserves.

2.8. Constraints of Monetary Policy in Highly Dollarized Economy

Honestly, the monetary policy provides a powerful instrument to control inflation and promote a country's welfare, subject to some challenges in the context of a highly dollarized economy.

The limitations of monetary policy mean that it cannot solve all economic problems.

2.8.1. Tanzania Country

Tanzania has a high level of dollarization in all of its forms. Foreign currency deposits accounted for roughly 30% of total bank deposits in December 2009, while foreign currency deposits to M2 (broad money) ratio was approximately 25%. In the opinion of Kessy (2011) [102], the monetary policy constraints in Tanzania country are the following.

- Financial systems of highly dollarized economies are prone to exchange rate fluctuation risks: A significant depreciation of the local currency will negatively impact the financial position of businesses that produce goods for the local market using foreign currency loans. Foreign currency debtors with national currency earnings may default on their debts, raising the risk of default and potentially hurting

institutions' financial situation. This danger makes monetary policy incoherent, especially in inflation targeting and other domestic anchor regimes.

- Eliminate the possibility for the government to finance fiscal deficit with seigniorage: The central bank can no longer issue national currency units at a minimum cost and use them to finance public spending because it has abandoned its currency and adopted foreign money as legal tender.
- Loss of lender of last resort facility of the central bank: the limitations it places on the central bank's ability to conduct as a lender of last resort to the local banking system. National banks lend to illiquid but solvent banks as a lender of last resort. The central bank may refuse rescue requests from domestic banking sectors if the bank runs on foreign currency deposits. Because foreign exchange reserves of the government are the sole cushion to hinder such a crisis in the financial industry, it retains considerable amounts of foreign currency.
- Ineffectiveness of monetary policy: Many studies have concluded that dollarization makes monetary policy more complicated and ineffective matter. The first issue that policymakers must address is the intermediate aim of monetary policy, specifically under the reserve money targeting framework. The critical question is whether central banks should choose monetary aggregates with or without foreign currency components. For example, Tanzania, Uganda, and Burundi aim for monetary aggregates with no foreign currency components, whereas Kenya and Rwanda aim for monetary aggregates, including foreign currency deposits. Another important consideration for the difficulties of implementing monetary policy in a dollarized economy is the extent of amplification to which the impact of exchange rate on domestic prices. The fact that highly dollarized countries have much pass-through suggests that exchange rate volatility in a dollarized economy will be more painful.
- Moreover, Kessy (2017) [103] argues, the monetary authority was required to accept transparent responsibility for the level of short-term interest rates under a policy-rate system. The absence of direct pressure for monetary finance and a period of fiscal indiscipline can consign the central bank into a difficult political position. We need to set a very high policy rate to avoid the inflationary finance of the deficit.

2.8.2. Ecuador Country

In January 2000, the absence of direct pressures of monetary finance and a time of fiscal indiscipline can result in the central bank into a complex political position to set a high policy rate to avoid inflationary finance of the deficit. Traditional monetary policy may appear complicated, if not impossible, to achieve in economies that adopted a foreign currency as their own. Below is a fundamental logic restriction that comes from the impossibility of monetary emission by a national central bank.

- Loss of seigniorage benefits: This is the profit a central bank misses out on by producing its currency. The difference between the material costs of creating currency and its face value accounts for the most profit.
- Loss of independent monetary policy: A country's central bank loses its power to set interest rates and implement other policy measures to offset the effects of economic recession when it lacks a national currency.
- Diminished role in preventing domestic bank failures: Central banks, such as the Federal Reserve of the United States, can play an essential role as "lenders of last resort" in rescuing banks during significant economic crises, but a country without a fully operational central bank would have far less power to execute such interventions.
- Political and other symbolic costs: The decision to use another country's currency can weaken the sovereign authority's grip on internal and external politics. Currency, like languages, can encourage national solidarity and are frequently considered tangible symbols of a country's identity, similar to flags, postage stamps, and national anthems. These symbols can serve as powerful sources of national unity and help governments deal with the challenges of overseeing a newly established country. When the government espouses a foreign currency as legal tender, these good benefits on nationbuilding aims are lessened (Wang, 2016)[104].

2.8.3. Afghanistan Country

In Afghanistan, monetary policy entails using instruments by the Da Afghanistan Bank to influence the economy's money supply to achieve overall price stability and financial system stability. Afghanistan has certain monetary policy restrictions in the following areas:

- Currency mismatch and exchange rate swings expose a highly dollarized economy to solvency and liquidity issues, making the financial sector sensitive. When a strongly dollarized economy faces some level of instability raises concern about the risks. Those risks will associate with the banking sector; the demand for assets denominated in home currency falls, causing the currency to depreciate.
- Liquidity risk, the deposit of many banking systems would be in foreign exchanges in a dollarized economy. The more foreign-denominated loans banks make to local families and businesses, the more vulnerable the banking sector becomes to liquidity risk caused by exchange rate alteration. An impressive depreciation of the national currency would burden households and enterprises whose receipts are in local currency but whose debts are in the greenback. It would increase the likelihood of defaulting on their debts denominated in foreign currencies and weaken the financial position of the banking sector.
- Solvency risk: Currency mismatch, like liquidity risk, is the leading cause of solvency risk in a dollarized financial system. In the event of significant national currency depreciation would harm the balance sheets of banks in two ways: first, by lowering the value of local currency-denominated assets on their balance sheets, and second, by weakening the financial position of debtors whose income is in domestic currency, increasing the risk of default on their foreign exchange denominated debts.
- Loss of seigniorage income: Under partial dollarization, the revenue of the government from printing units of the domestic currency drops due to the usage of foreign exchange as a medium of exchange by the domestic residents. Our seigniorage loss forecasting is equivalent to 460 billion Afghanis based on the anticipated stock of external currency in circulation from 2002 to 2015.
- Loss role of last resort lender: Central banks attempt to aid illiquid banks in overcoming deposit runs as lenders of last resort. Because the national central bank lacks the legal authority to produce foreign currency, it would lose some of its ability to function as a last resort lender to the domestic banking sector in times of financial crisis if it was to dollarize partially. The contribution of foreign currency deposits to total deposits in the banking system is substantially high in Afghanistan. Over the 2006 to 2015 period, the share of foreign currency deposits has experienced some degree of fluctuations falling to 66% of the total deposit of the banking, restricting Da Afghanistan Bank's ability to behave as lender of last resort.

- Ineffectiveness of monetary policy: It is complicated for the monetary authority to compute the financial crisis inquiry commission. Also, manage the foreign currency component of broad money in a dollarized economy. As a result, the role of the monetary authority in determining money supply would diminish, reducing the effectiveness of the monetary policy. One could argue that in a strongly dollarized economy, when non-tradable products and services are priced in a foreign currency, the exchange rate will be passed on to domestic pricing through a wider variety of items, making exchange rate volatility more severe. Widespread transaction dollarization (currency substitution) will likely enlarge the demand for foreign exchange in the economy, putting pressure on the exchange rate to fall and weakening the domestic currency.
- Muzaffari and Mira (2019) [105] mention that the higher the currency substitution, the more exchange rate volatility would be. It hurts the domestic economy by increasing inflation rate volatility, increasing exchange rate risk, and destabilizing inflation expectations.

2.8.4. Latin American Countries

Dollarization chiefly refers to the substitution of foreign currency and its influence on the management of monetary policy. The official dollarization of an economy requires a country's legalization to use greenback in the economic activity of its domestic market. A measure of this kind could foresee the use of any other currency. On the other hand, in Latin America, The United States' political and commercial dominance has been decisive, which has led some countries to supersede their home currency with the dollar. Panama became officially dollarized in 1904, Ecuador in 2000, and El Salvador and Guatemala in 2001. Rennhack and Nozaki (2006) [106] report the proportion of foreign currency deposits in total deposits in 2001 as Bolivia 91.4%, Ecuador 100%, El Salvador 100%, Uruguay 74.3%, and Venezuela 92.5%. With a high

dollarization economy, these countries faced monetary policy constraints, such as falling below:

- It involves the loss of a powerful symbol of national identity, an emergency source of governmental revenue, and a crucial measure of diplomatic protection.
- The dollarizing country's monetary autonomy is lost because it can no longer control its money supply or exchange rate unilaterally. For example, the Argentines have gone

almost a decade without having their monetary policy.The greater the degree of currency substitution has already occurred due to market pressures and preferences, the wider the constraint imposed on a government's ability to handle macroeconomic situations, the smaller the real loss of monetary autonomy if the domestic currency is formally ignored in the future.

- The government gave up a potentially vital instrument for financing government expenditure: the ability to generate money, sometimes known as seigniorage, which is not available through taxation or borrowing from domestic or international financial markets.
- Since adopting a foreign currency, the country loses a legal lender of last resort and a national bank capable of freely discounting in financial crisis. Resultantly, domestic banks may be more vulnerable to potential liquidity risks.
- Political costs. Exaggerating the political outcome of dollarization, which is visible and potentially significant, is more complex, and governments fear internal division or symbolic opposition to benefit from maintaining a national currency.
- Finally, the preservation of a national currency aids governments in being aware of external dependence or threats in international affairs and diplomacy. National monetary autonomy makes it possible for policymakers to avoid reliance on other sources with the most critical economic resources (Cohen, 2000b)[107].

2.9. Encouraging the use of home currency

There are similar kinds of literature on “carrots” and “sticks” on measures to improve the usage of national currency in transactions of all sorts, particularly on efforts to discourage the use of greenback in the economy.

Excessively aggressive efforts that make the dollar more challenging to get are beneficial moves toward improving the attractiveness of the home currency. Sound and stable monetary policies are commonly viewed as necessary, though not sufficient. There might be a rationale for inflation indexation in financial instruments, at least for a transitory period, because it takes time to establish the trustworthiness of policies. The government may foster financial innovation by including indexation provisions in its bonds and utilizing its regulatory authority to encourage banks to offer indexed deposits. Chile and Israel pioneered this approach in the 1980s and countries in Latin America such as Bolivia, Brazil, and Uruguay.

Various other measures related to market infrastructure development have also been identified to foster deep and liquid domestic currency in financial markets and encourage residents to escape the dollar. These include strengthening clearing and settlement systems, enhancing market transparency, improving corporate governance, installing efficient bankruptcy and insolvency procedures, and maintaining creditors' rights to hold local currency claims.

The government may contribute, and other positive initiatives suggested include establishing privately funded pension systems required to compensate contributors on a national currency schedule, encouraging establishing a group of institutional investors interested in long-term local currency claims. They also include regulatory efforts to promote derivative markets, which may be used to hedge currency risk. Suppose they see the exchange rate fluctuate daily. In that case, borrowers properly consider these risks and imply that one constructive measure that the authorities can use to encourage the local currency's use is to switch to a more flexible rate (Barry, 2006)[108].

CHAPTER 3

RESEARCH 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 Employments	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 Employments	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 (3rd edition) and Sim (1980), Vector Autoregression (VAR) model is set as follows: $Y_t = \beta_{10} + \beta_{11}Y_{t-1} + \cdots + \beta_{1p}Y_{t-p} + \cdots + \gamma_{1p}X_{t-p} + \varepsilon_{1t}$ (1)

$$X_t = \beta_{20} + \beta_{21}Y_{t-1} + \cdots + \beta_{2p}Y_{t-p} + \cdots + \gamma_{2p}X_{t-p} + \varepsilon_{2t} \quad (2)$$

Where the β and γ are unknown coefficients and ε_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:

$GDP = 1.161*GDP_{t-1} - 0.156*GDP_{t-2} + 312336.24*OFFICIAL\ EXCHANGE\_RATE_{(t-1)} - 50688.194\ *OFFICIAL\ EXCHANGE\ RATE_{(t-2)} + 14577117.99*M2_{(t-1)} - 9088391.42007*M2_{(t-2)} - 16866469.273*EXPENSE_{(t-1)} + 79751802.6027*EXPENSE_{(t-2)} - 895065830.78\varepsilon_{1t}$ (3) Coefficient from Regression of Official Exchange Rate as follows:

$OFFICIAL\_EXCHANGE\_RATE = - 1.596*GDP_{(t-1)} + 1.711*GDP_{(t-2)} + 0.964\ *OFFICIAL\_EXCHANGE\_RATE_{(t-1)} - 0.112*OFFICIAL\_EXCHANGE\_RATE_{(t-2)} - 0.873\ *M2_{(t-1)} + 5.870*M2_{(t-2)} + 3.081*EXPENSE_{(t-1)} - 0.235*EXPENSE_{(t-2)} + 506.66\ \varepsilon$ (4)

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

$M2 = 9.090*GDP_{(t-1)} - 1.068\ *GDP_{(t-2)} - 0.030*OFFICIAL\_EXCHANGE\_RATE_{(t-1)} + 0.025*OFFICIAL\_EXCHANGE\_RATE_{(t-2)} - 0.348*M2_{(t-1)} - 0.258*M2_{(t-2)} - 0.249*EXPENSE_{(t-1)} + 0.313*EXPENSE_{(t-2)} + 64.360\ \varepsilon_{1t}$ (5)

Whereas, Government ‘s Expenditures function as following:

$EXPENSE = 9.482*GDP_{(t-1)} - 1.258\ *GDP_{(t-2)} + 0.0007*OFFICIAL\_EXCHANGE\_RATE_{(t-1)} + 0.002\ *OFFICIAL\_EXCHANGE\_RATE_{(t-2)} - 0.015*M2_{(t-1)} + 0.0411\ *M2_{(t-2)} + 0.667\ *EXPENSE_{(t-1)} - 0.076\ *EXPENSE_{(t-2)} - 7.888\ \varepsilon_{1t}$ (6)

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

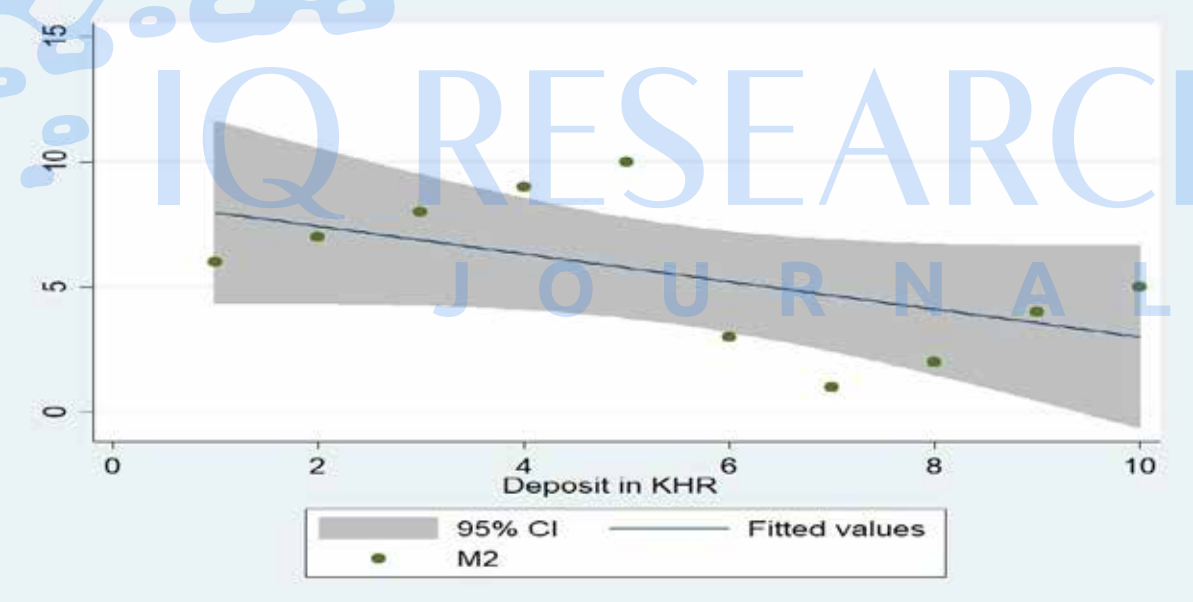
3.4. Empirical Results and discussion

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



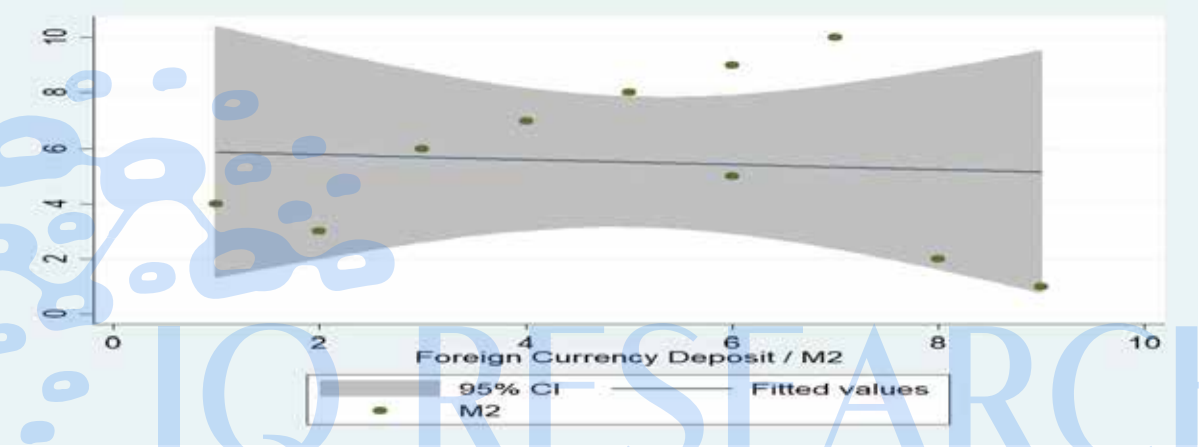
Note: Both variables are in logarithm values.

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.

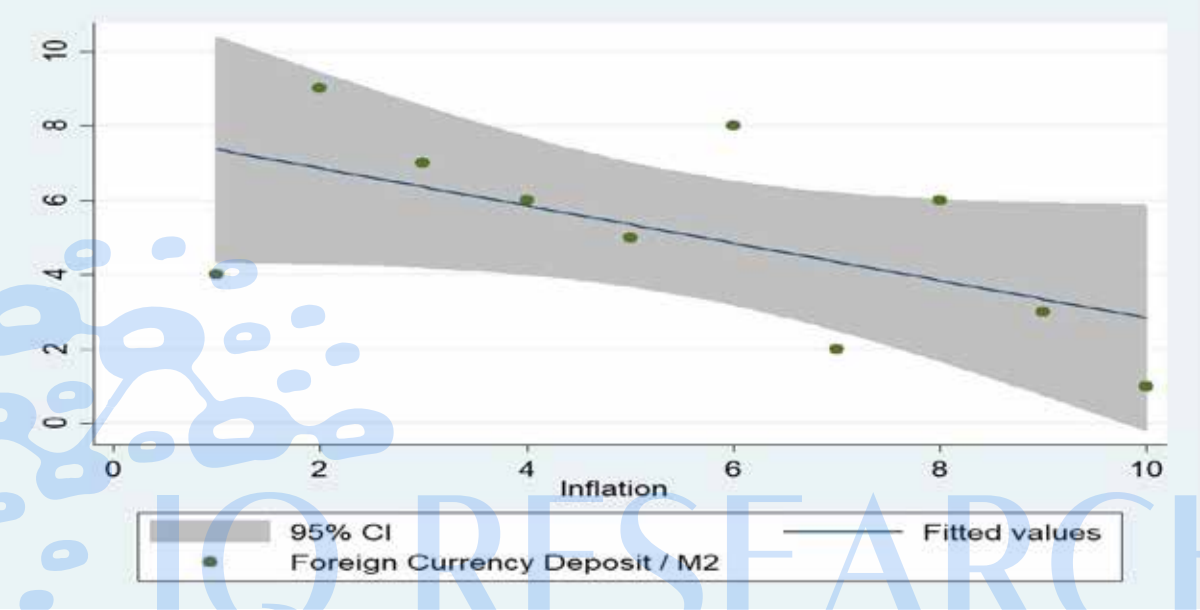
Source: **Author's based on the NBC data and STATA's illustration**

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.

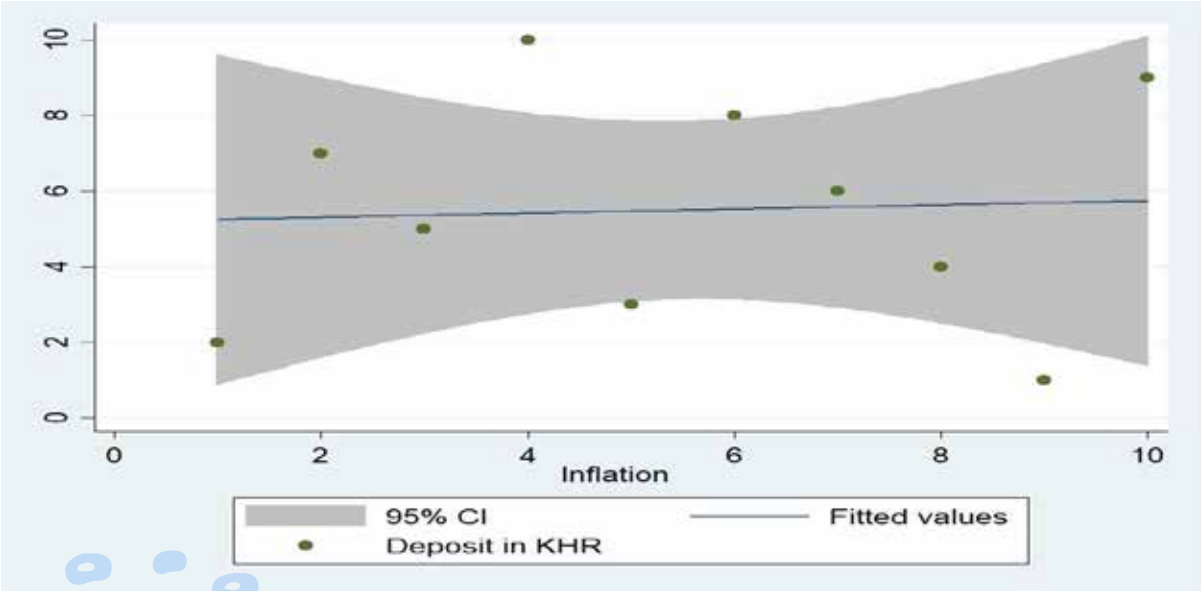
Figure 3.3: The relationship of foreign currency deposit and Inflation in Cambodia



Note: Both variables are in logarithm values.

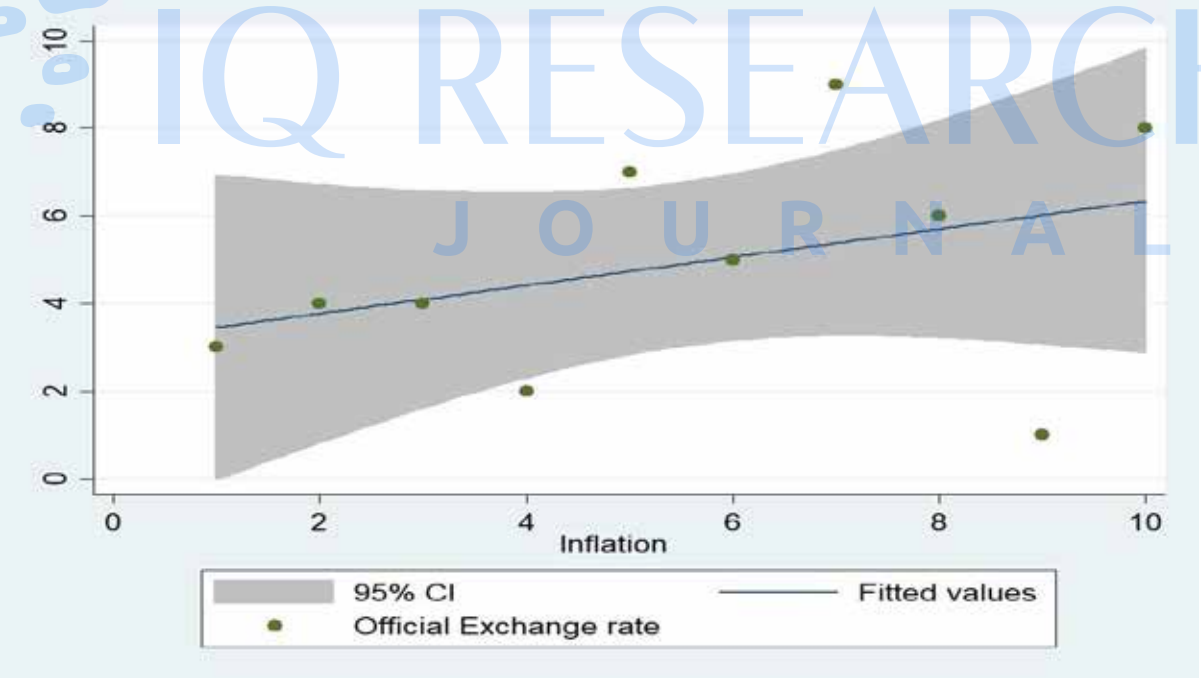
Source: Author's based on the NBC data and STATA's illustration

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



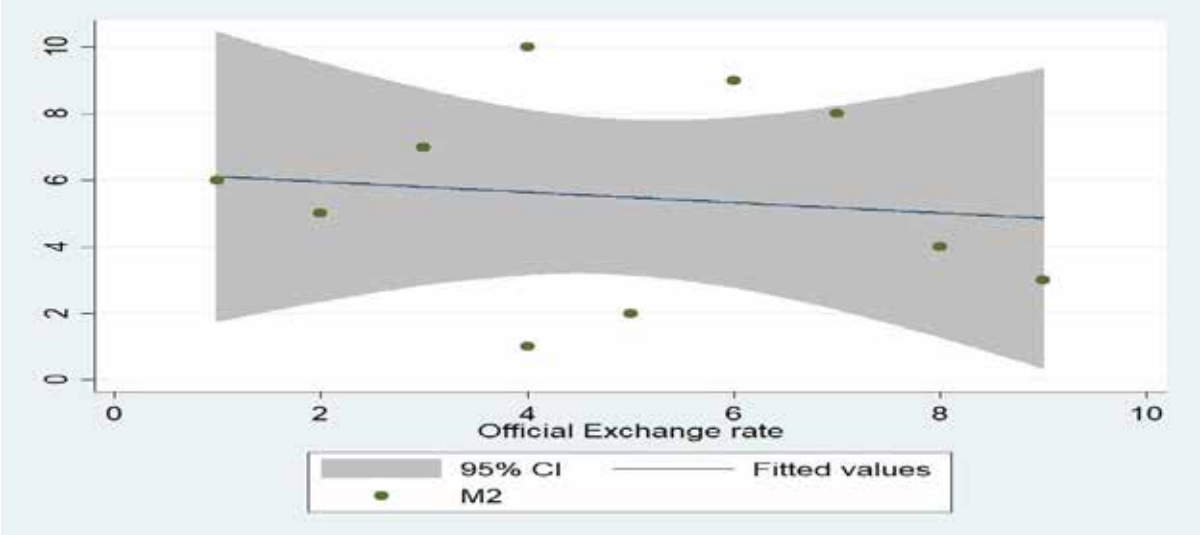
Source: Author's based on the NBC data and STATA's illustration

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

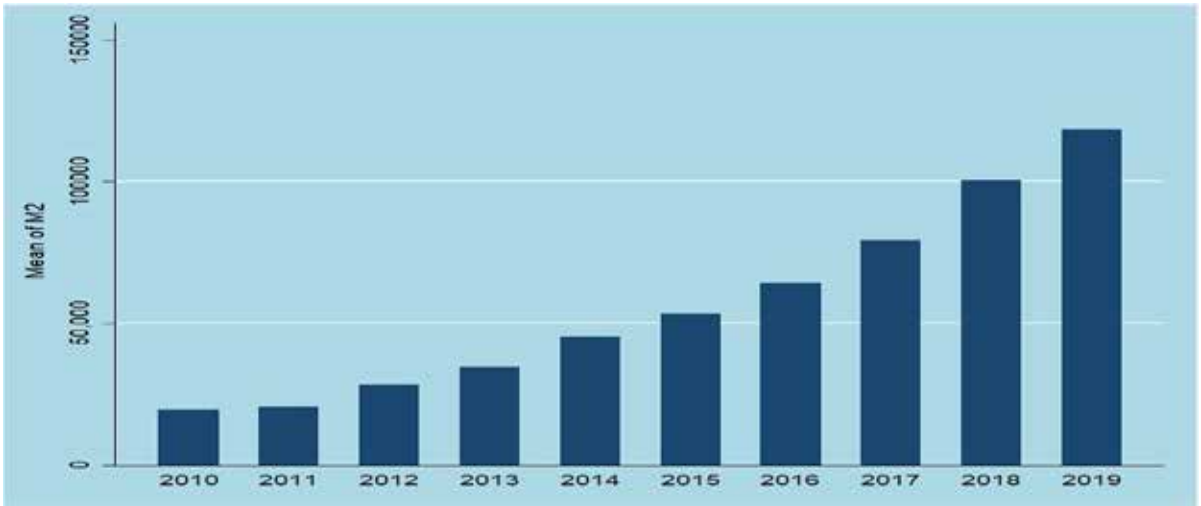
Figure 3.6: The correlation of broad money and official exchange rate in Cambodia



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)[109] 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

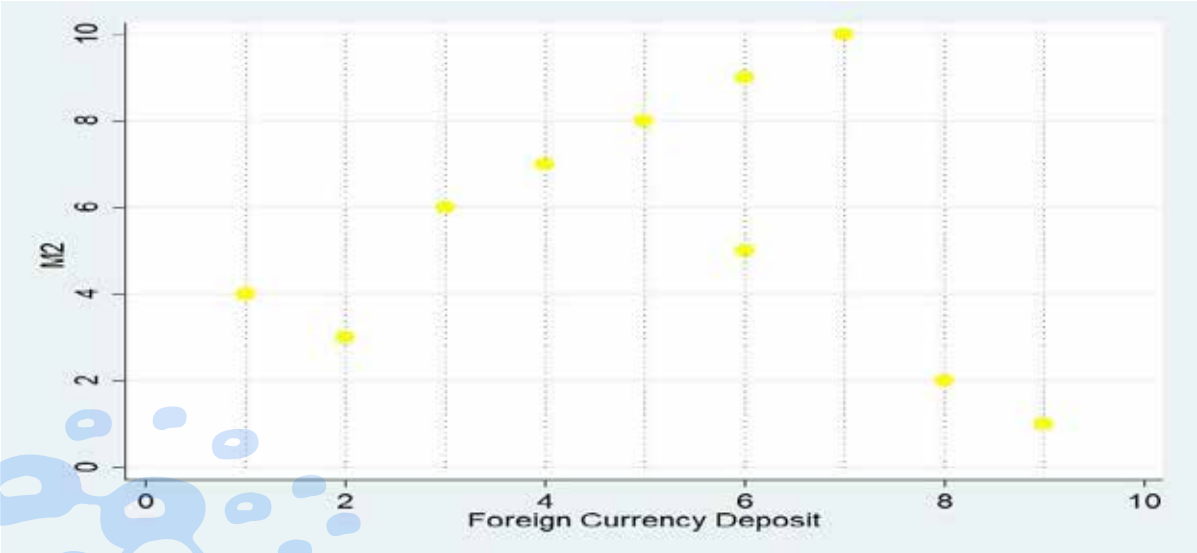
Source: **Author's calculation from NBC and ADB data from 1992 to 2015**

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

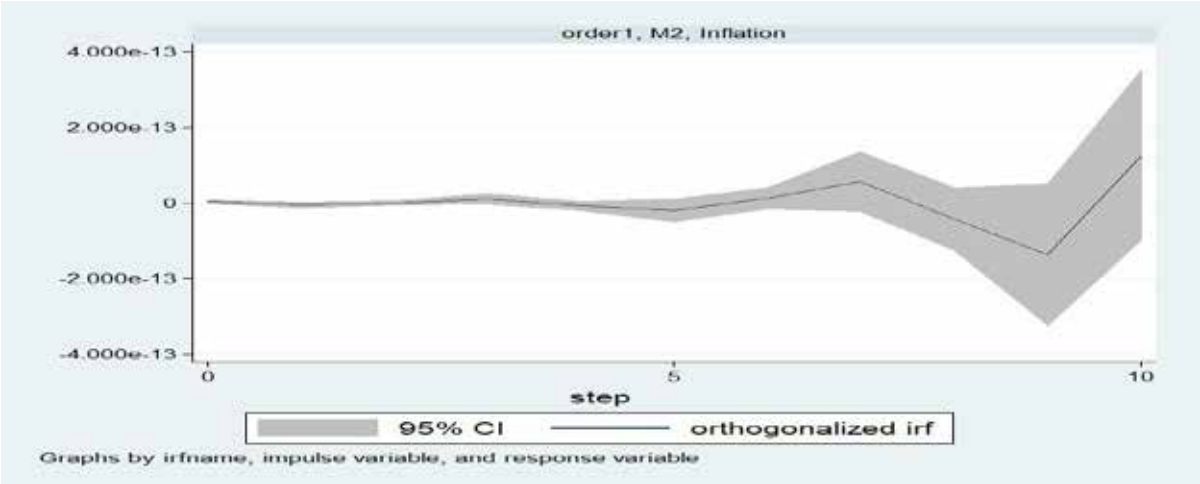


Source: Author's based on the NBC and ADB data

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.

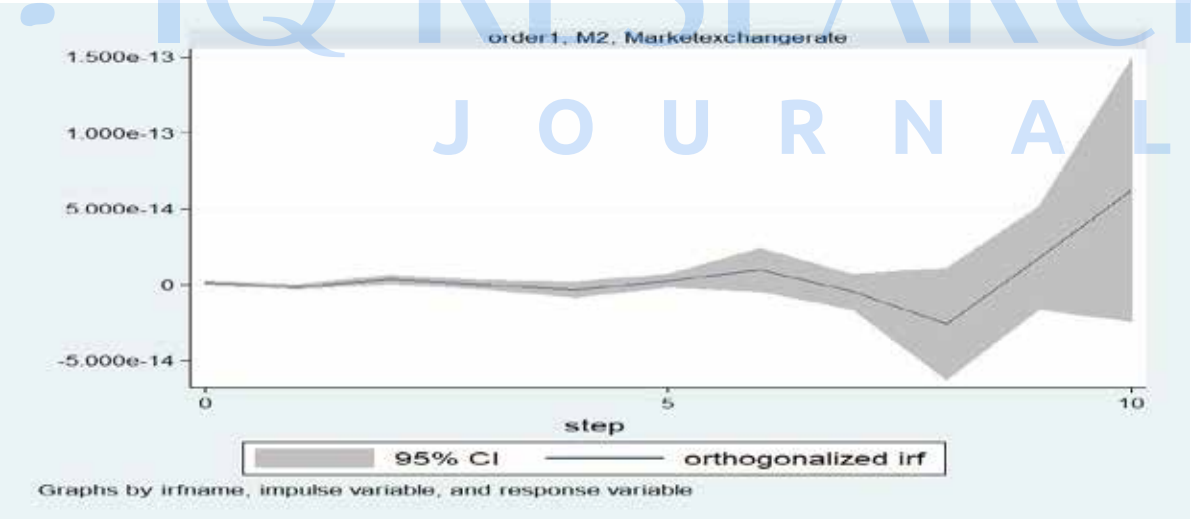
Figure 3.10: The Impulse Response Function (IRF) of M2 and Inflation after VAR Model



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

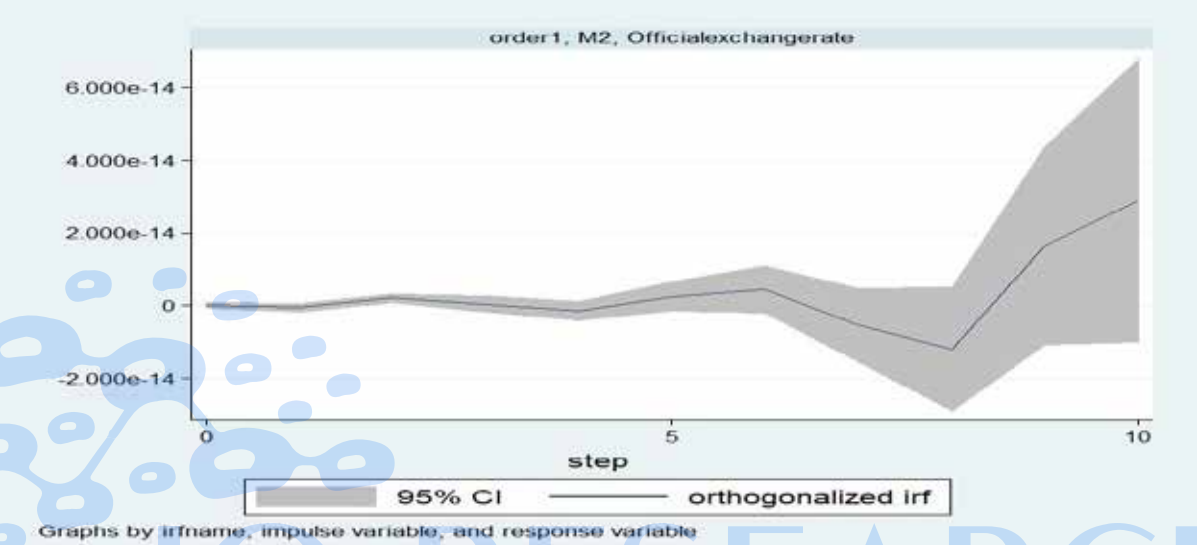


Source: Author's based on the NBC and ADB data

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**

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.

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

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. resides	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

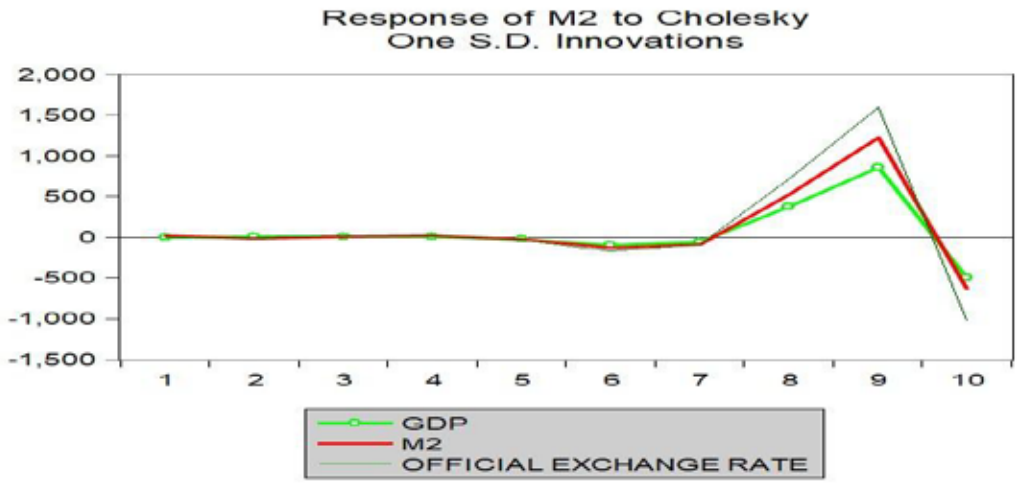


Figure 3.14: Response of exchange rate to GDP, M2, and Exchange Rate in Cambodia

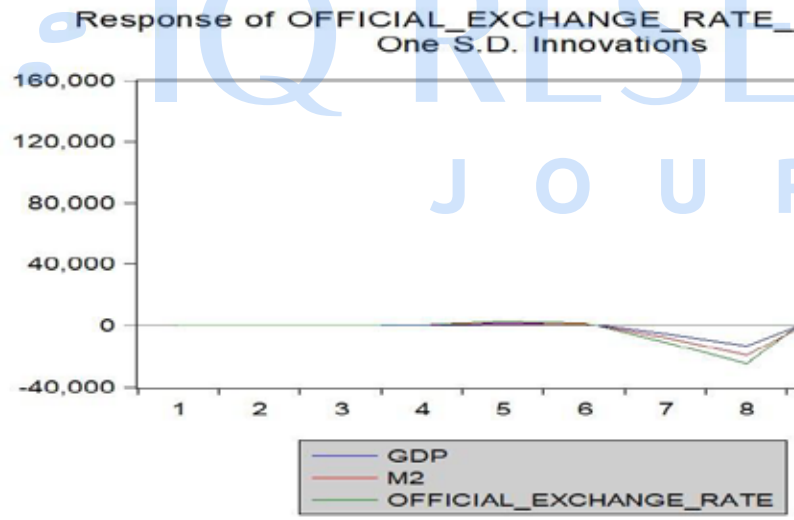


Figure 3.15: Response of expenditures to GDP, M2, and Exchange Rate in Cambodia

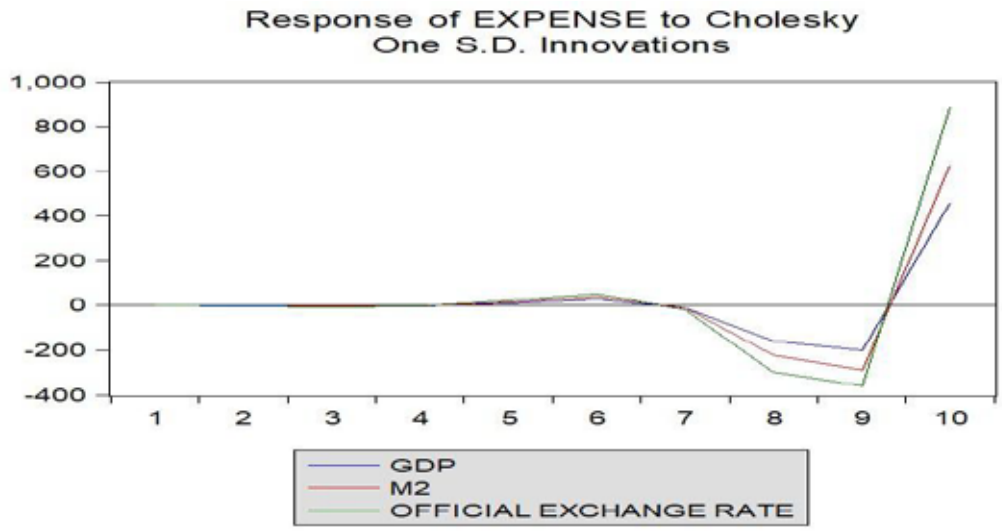


Figure 3.16: Response of Goods Export to Cholesky One S.D. Innovations

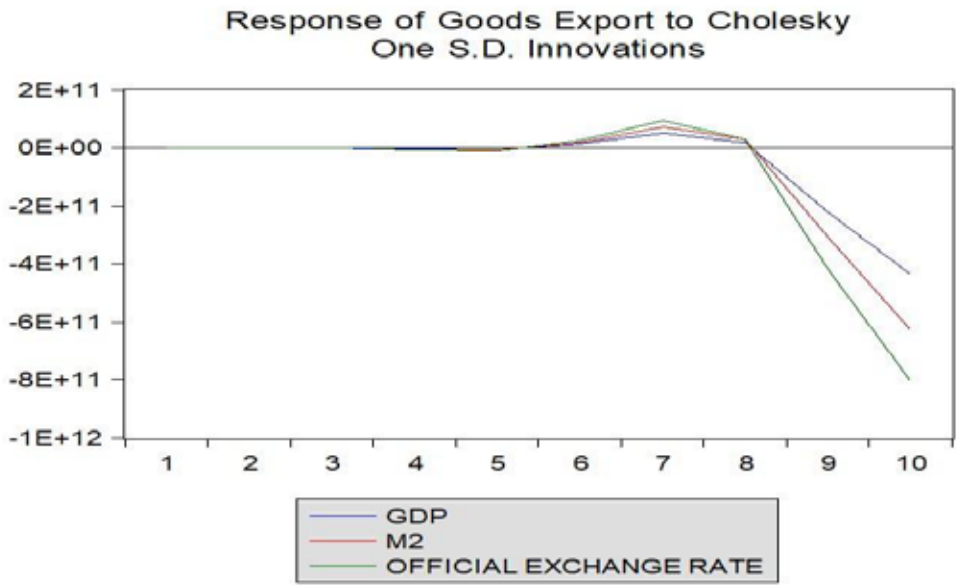


Table 3.4: Robustness Check: Ordinary least squares (OLS) regression

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.

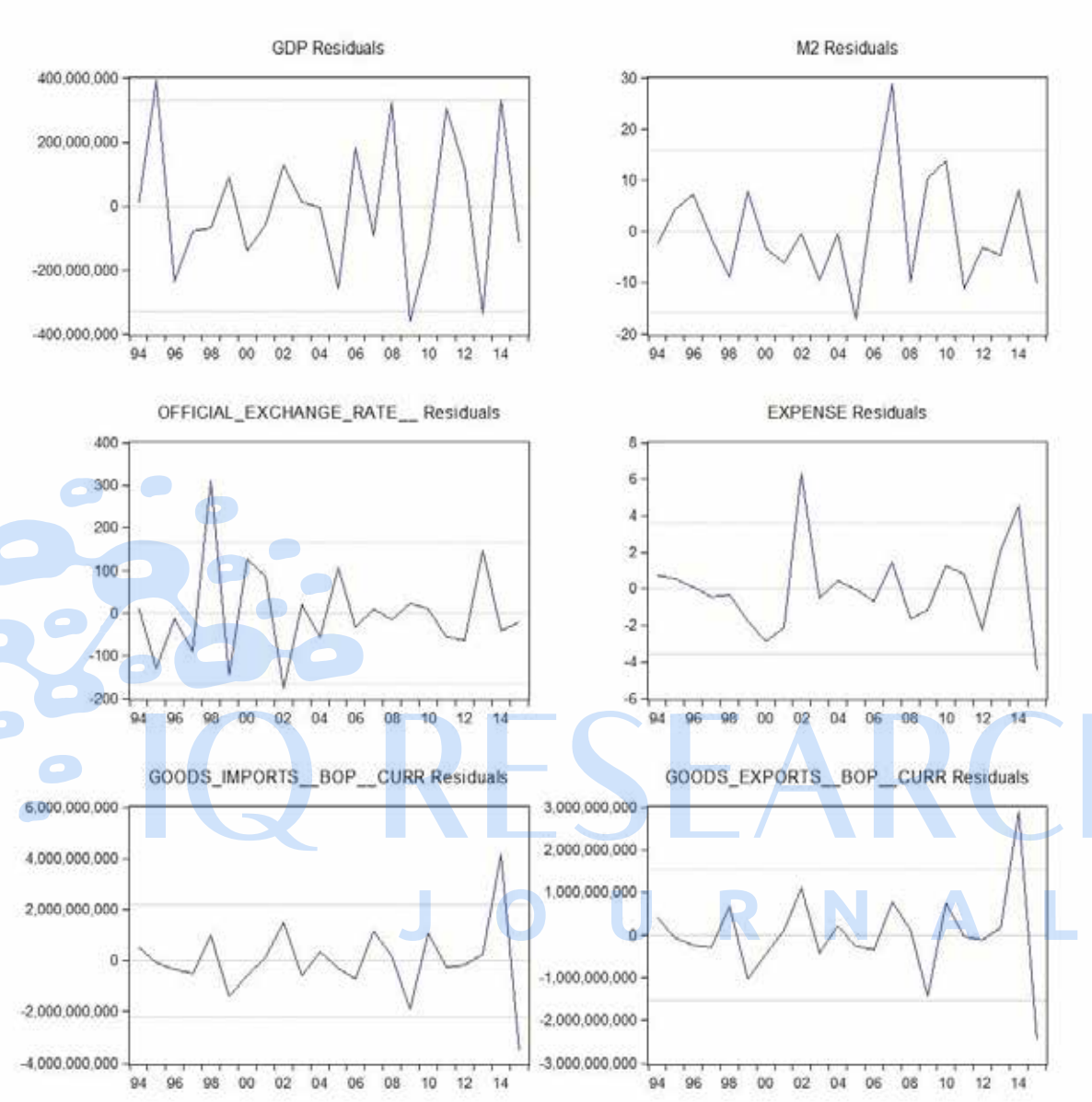
VCE cluster is used to proxy and control all equation problems to get a smooth result in the above table. Furthermore, STATA version 14 is implemented in this regression too.

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)[110].

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



CHAPTER 4

RESULT OF THE RESEARCH

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 assetsdenominated 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)[111], 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 zamaródzy and Sa, 2002)[112].

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-1980; 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)[113].

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)[114].

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.))[115].

Zykova, (2017) [116] 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,

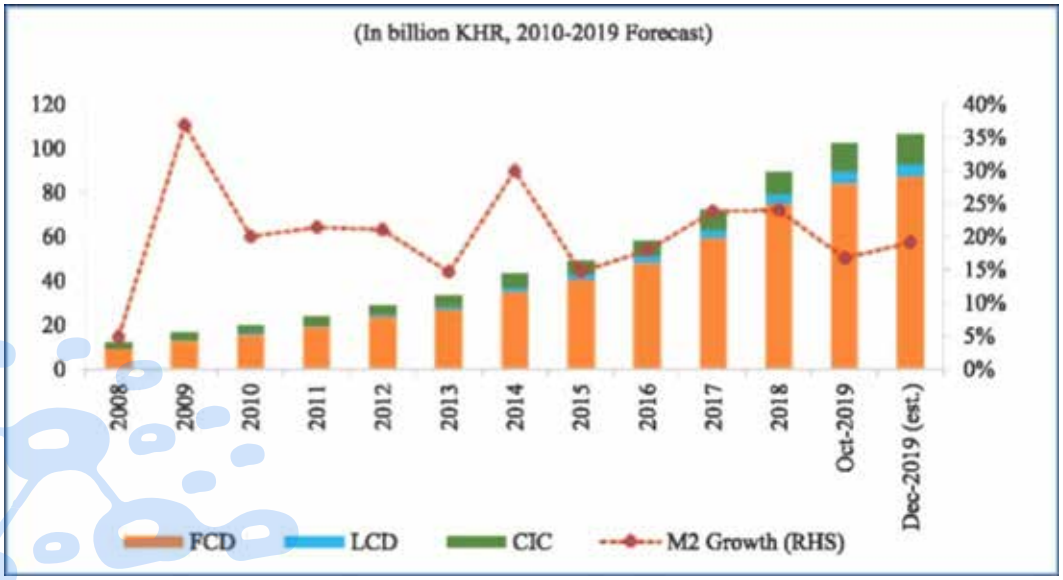
the share of Foreign Currency Deposits (FCDs) in broad money (M2) reached an all-time high of 82 percent (Hill and Menon, 2013)[117].

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).[118]

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).[119]

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)[120]. According to NBC (2019a)[121] 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).

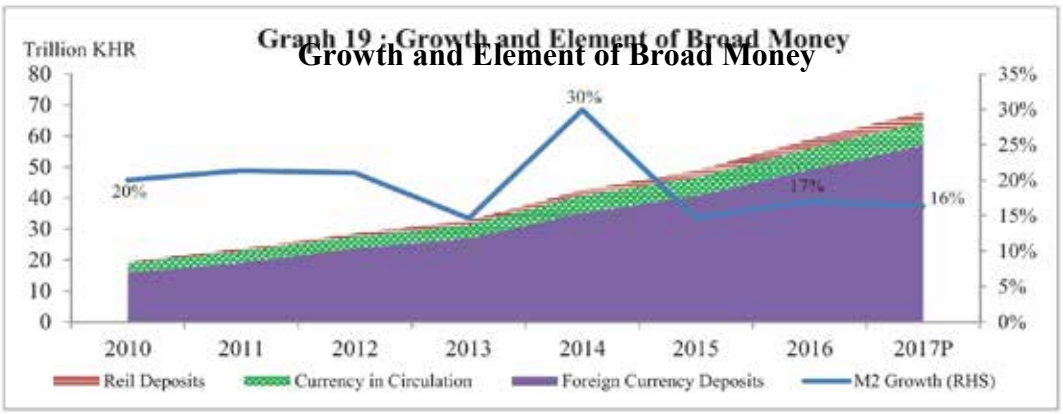
Figure 4.1: M2 Monetary Aggregate



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)[122].

Figure 4.2: Growth and Element of Broad Money

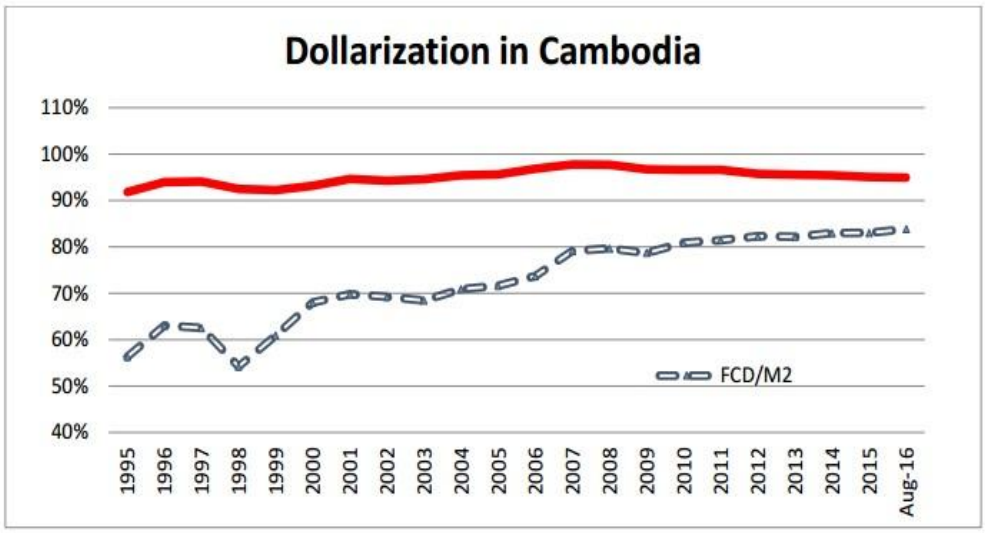


Source: National Bank of Cambodia

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)[123] 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)[124].

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)[125].

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)[126]. 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[127], 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)[128]. 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)[129]. Referring to Khmer Times (2017) [130], 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)[131]. 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) [132] . Cambodian people do not earn interest from money stock denominated in dollars. The net annual income forgot determined in the range of USD 20 to 90 million per year (IM et al., 2007b)[133].

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 deduced. Thereupon, the net international reserves of Cambodia have uninterruptedly increased since the 1999s. 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)[134].

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) [135] 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 currencydenominated 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)[136].

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)[137]. 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 ½ of 1 percent, and it intends to eliminate the spread (Odajima & Khou, 2016b)[138].

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)[139].

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)[140] 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)[141].

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 riels 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)[142].

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)[143] 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)[144]. With a high level of dollarization, Cambodia stands to profit from increased trade (Zamaroczy and Sa, 2002c).[145] 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) [146] . 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)[147].

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) [148] 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

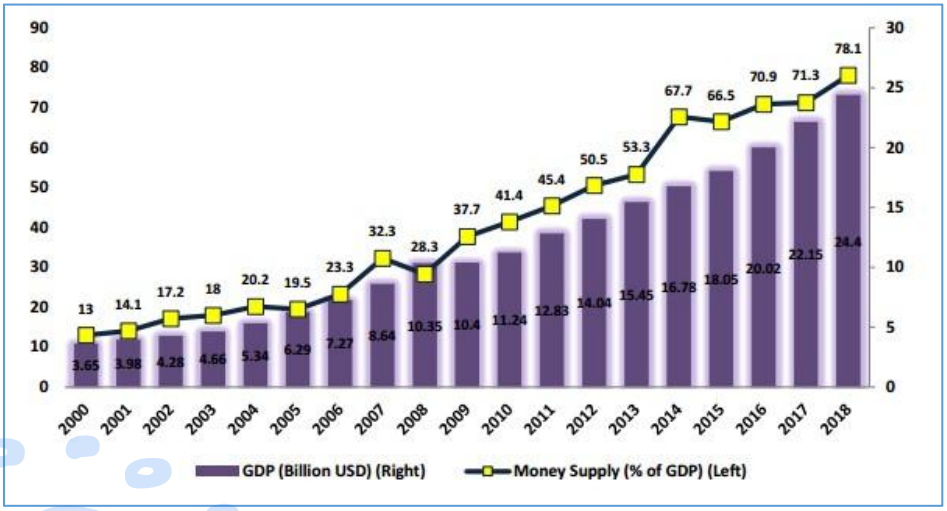
Dollarization has its roots in many of these circumstances, not so much in market failures as in policy failures, to the extent that legislation does not address evident imperfections. Creditors often internalize the underlying credit risk when deposits are guaranteed, or bankruptcy of private banks 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)[149].

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),[150] 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

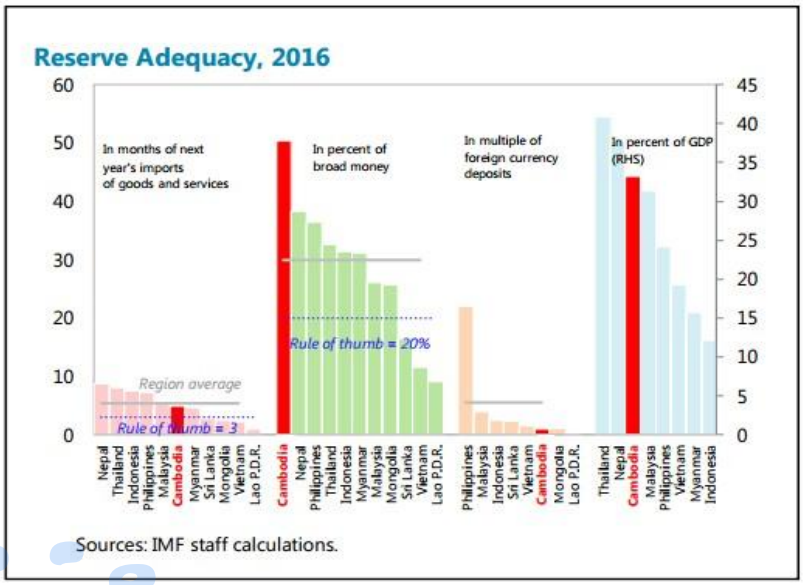
A central bank expands or contracts its base money supply to affect macroeconomic variables and ultimately achieve its desired goals, including attaining inflation targets, economic growth, and employment creation. Also, monetary policy affects exports and imports through the exchange rate channel. It 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)[151].

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)[152], 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)[153]. 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)[154].

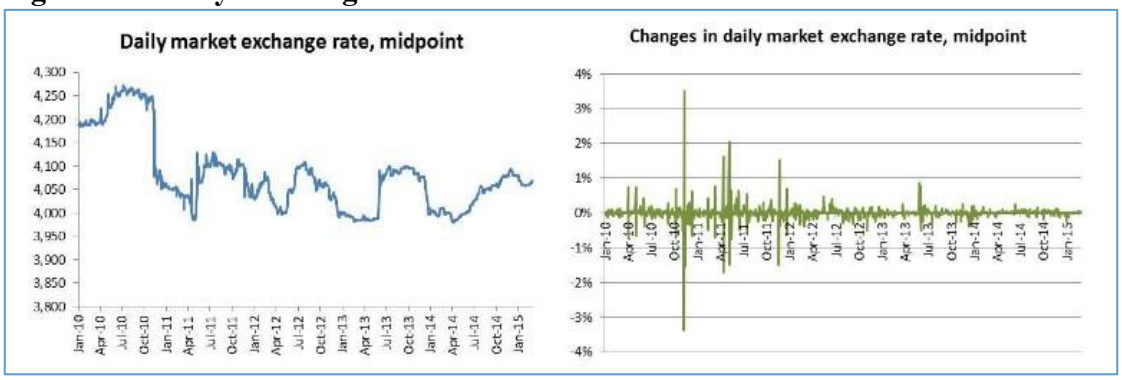
Generally speaking, people used the riel for food and beverage, alcohol and tobacco, water and electricity, and health, including toiletries. However, for house rent, communication, furniture and appliances, real estate, and related services are transacted in dollars. In contrast, riel is used frequently 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)[155]. *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)[156].

Luis Palacios-Salguero (2008)[157] 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.

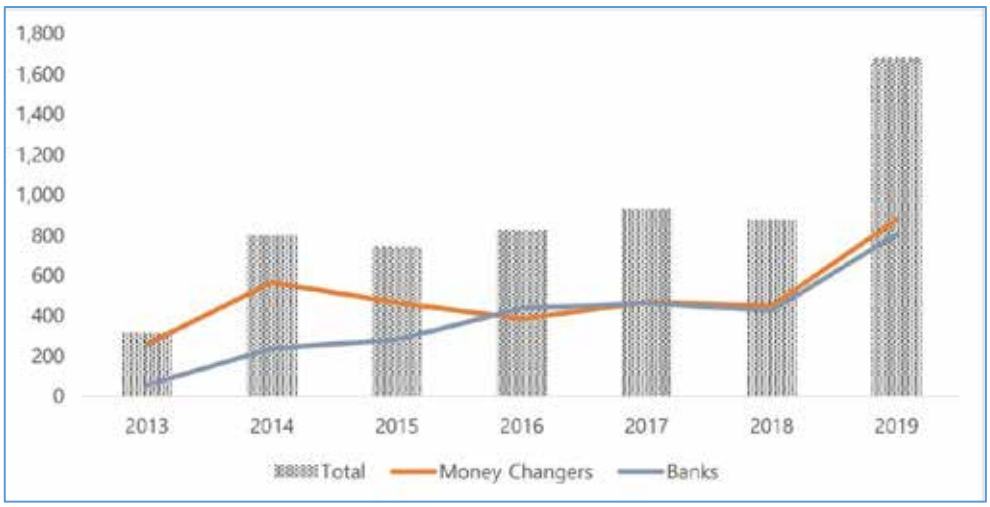
Figure 4.6: **Daily Exchange Rates and their Movement**



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)[158].

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)[159] 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)[160].

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) [161] 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)[162].

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)[163]. 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

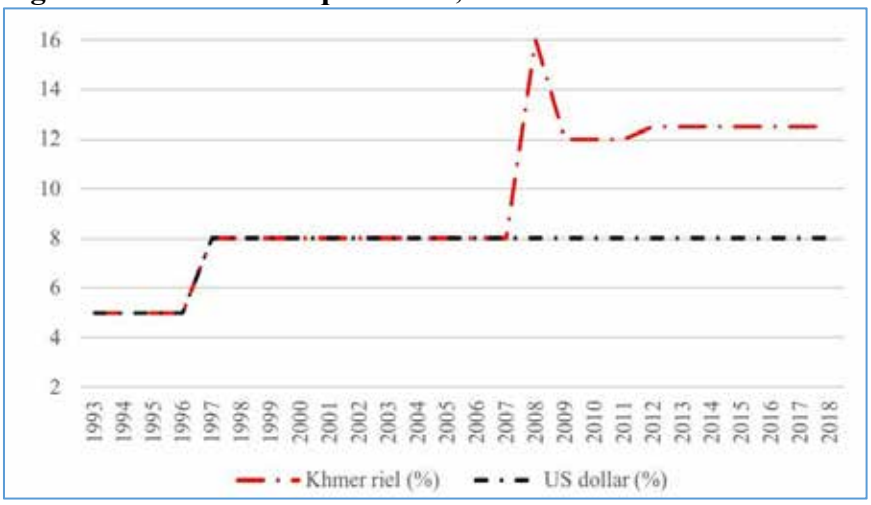
liquidity in the markets and promotes financial strength to meet its goal by changing the funding situation of financial institutions.

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).[164] 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)[165].

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)[166].

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 Crescenzio A. et al., 2021)[167].

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)[168].

Referring to Russell Shor (2020),[169] 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)[170].

4.5.4. Open-Market Operation

The Bank of Slovenije (2021)[171] 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 baking 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)[172].

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:
    - Marketing of securities issued by the RGC or public entities, and also function as a registrar and transfer agent; ○ 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, in open market operations, or in discounting operations, or credit extension to financial institutions (NBC Article 26, 1996c)[173].

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)[174]. 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)[175].

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)[176].

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 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)[177].

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 ○ 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 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 ○ Deposit temporary excess reserve funds at the central bank ○ Diminish risks connected with the supply of liquidity ○ 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.

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 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:

Interest = P x r x 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

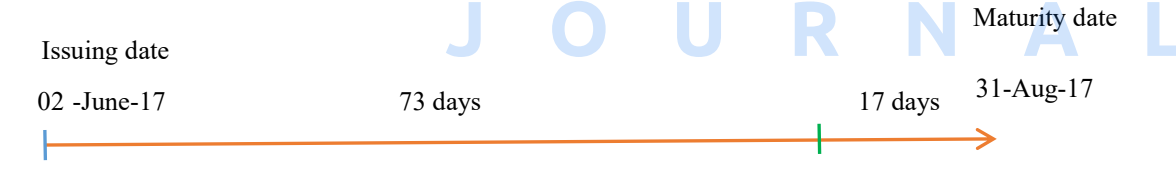
- Highly liquid: NCD is a short-term instrument, risk-free, and issued by the national bank. Thus, it can be traded in a greatly liquid secondary market.

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

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

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%.



$$Repurchasing\ price = \frac{Future\ Value}{[1 + \{Repurchase\ rate\ x\ (\frac{17}{365})\}]} \quad \frac{1{,}002{,}219.18}{1 + \{1.3\%x\ (\frac{17}{365})\}} = = \$1{,}001{,}612.72$$

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.

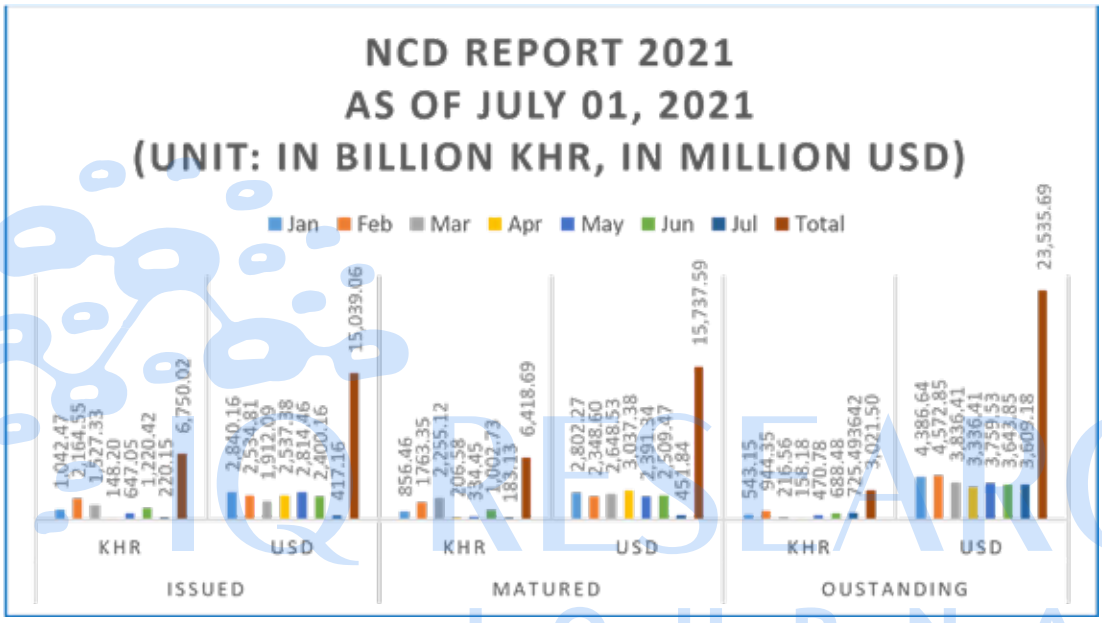
NCD is a short-term interest-bearing debt instrument issued by the NBC. National Bank issues this security in KHR and USD to resolve depository institutions to invest their short-term liquidity excess. Maturity of KHR/USD NCD starting from one week to one year with interest determined by NBC, which fluctuates 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)[178].

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) [179] , 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)[180].

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
Total	**48,560,000**	**3,662,570**	**3,848,255**

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)[181].

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-Dormbush 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)[182].
    - 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)[183].

- 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)[184]. 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 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

CHAPTER 5

CONCLUSION AND RECOMMENDATION

Cambodians utilize the US dollar as their currency all over the country along with baht near the Thai border like Koh Kong, Banteay Meanchey, Battambang, Kompong Som, Pursat province; the dong at the Vietnamese border like Takeo, Svay Rieng, Kampong Cham, Svay Rieng province; The Kip at Lao borders like Stung Treng, Ratanakiri, and Kratie province. We cannot de-dollarization shortly because it would destroy the confidence of local residents; therefore, the good choice was to encourage the use of home currency for the three functions of the money that would contribute to support sustainable economic growth.

5.1. 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 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.

5.2. Recommendations

Dollarization posed constraints on the national bank to conduct monetary policies, exposed the economy to shocks. It also hinders the central bank's capability to fulfill other vital roles to accomplish macroeconomic policy objectives.

The ultimate objective is to promote greater use of the riel currency in the economy because it can benefit a lot for the country. The Cambodian authorities should focus on market-based policies. We need to combine supportive and market-oriented policies as there is no silver bullet in encouraging the use of our domestic currency. Forced and rapid de-dollarization should be averted, and it has been unsuccessful elsewhere (Pum & Vanak, 2010)[185]. In addition, the high degree of dollarization constraints the effectiveness of the monetary policy. This situation is likely to persist in the RGC for many years. The current managed floating exchange rate regime offers some autonomy to NBC in setting its monetary policy. However,

many factors work against this, including a shallow financial market, a high exchange rate passthrough, weak monetary institutions, and a dollarized credit market. We suggest some policies for Cambodia based on experiences from many successful de-dollarized economies or lowering dollarization in their countries as below.

5.2.1. A fully independent central bank

Central bank independence and the adoption of far-reaching institutional, policy, and operational reforms are necessary to shape credibility and improve monetary policy efficiency. Such reforms need to target the monetary policy constraints, addressing institutional and administrative weaknesses, financial sector segmentation, and measures to lessen dollarization.

The independence and reliability of the central bank must influence the formulation of monetary policy and public expectations about the efficacy of that policy. Reform of monetary policy instruments would help support monetary policy tactics (Pinshi, 2020)[186].

NBC also needs to strengthen its technical capacity to judge inflation developments through a systematic compilation and analysis of high-frequency data on economic activity. International experience proposes that dollarization tends to persist for a long time after stabilization, even when the duration of instability is prolonged. It also reveals that measures that provide the right incentives for national currency use are more effective than measures to force de-dollarization. The measures for de-dollarization need the adoption of macro-and micro-economic policies to enhance the attractiveness of the home currency versus the foreign currency (De Bolivia, 2012)[187].

Efforts to encourage de-dollarization - would also benefit the development of the financial sector. It can focus on pull factors (market-based de-dollarization measures) such as strengthening liquidity management and instruments, developing domestic currency and capital markets, and enhancing the adoption of the local currency. And rather than push factors (forced de-dollarization measures), such as compulsory use of domestic currency or regulations against the use of foreign currency, which in essence cause the holding of national currency assets. Proper sequencing is essential, and risks such as efficacy losses, capital flight, and banking sector instability need to be considered. Measures to force de-dollarization are not recommended in isolation from market-based measures. Nonetheless, these measures are

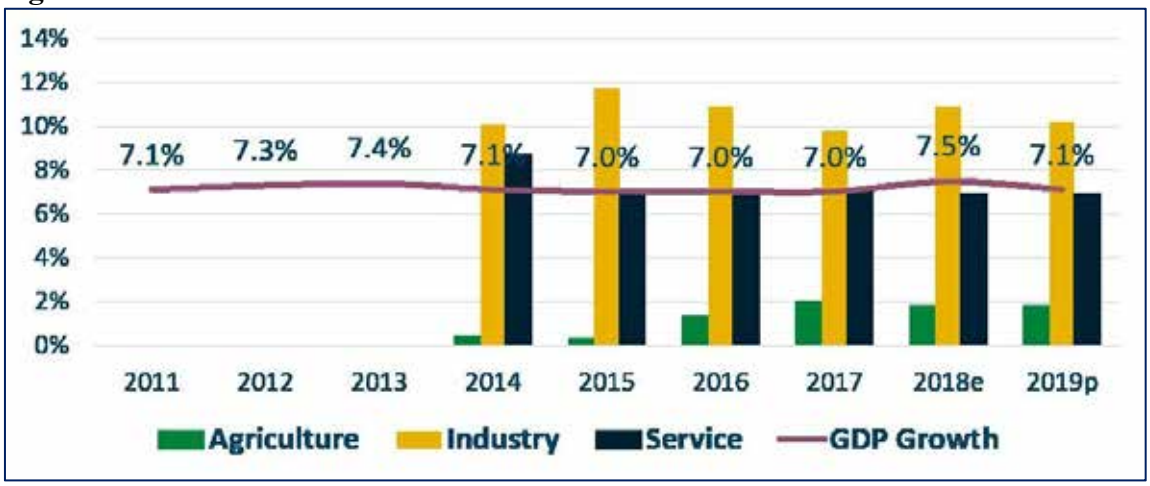
assumably demonstrated or even counterproductive except accompanied by a strong macroeconomic stabilization scheme (Imam, 2020a)[188]. The liberty of the central bank means not only the independence to decide how to continue its goals on the other hand also that other government bodies cannot easily reverse the central bank's decisions (Drazen, 2002)[189].

5.2.2. The macroeconomic environment

Cambodian has obtained macroeconomic stability over the past decade with low inflation as bellowed than three percent per annum. High growth with a GDP growth rate of around seven percent per year, as indicated in figure 5.1, and a credible fiscal position. The government authorities should desire to build upon this achievement, given that the limited monetary policy tools, the fiscal authorities' continuous buy-in through a prudent budgetary stance are essential. In similarity, establishing the reliability of monetary policy is also necessary. Because gaining such credibility takes time, monetary policymakers must be regarded as making appropriate policy decisions in light of economic developments and being accountable and independent.

Conspicuously, the Cambodian economy counseled rapid growth with an average of 7.6% per year from 1993-2003 and pursued to reach the high growth of over 10 percent per year between 2004 and 2007 and sustain to grow rate about 7% per annum from 2011 to 2019.

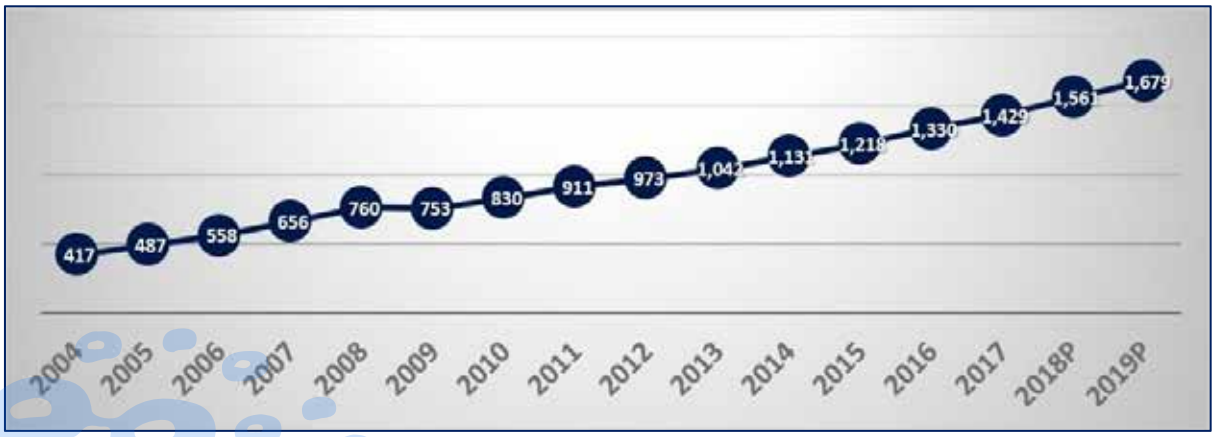
Figure 5.1: GDP Growth in Cambodia



Source: **Ministry of Economy and Finance**

Additionally, Figure 5.2 described GDP per capita has also steadily increased from $1,043 in 2013 to more than $1,561 in 2018 and extended to grow in the medium-term and approach around $1,679 in 2019 (CDC, 2020)[190].

Figure 5.2: GDP Per Capita in Cambodia



Source: **Ministry of Economy and Finance**

There are ways to promote the process of common de-dollarization, driven by economic reform, macroeconomic stability, improved institutions, political stability, and others, according to Jayant Menon, A senior economist for the Asia Development Bank said (VOA, 2020)[191].

We should coordinate a strategy to contract dollarization with an appropriate exchange rate policy. After dollarization has been pursued, retaining an independent monetary policy becomes complex, and exchange rate stability becomes a realistic option along these lines. In the lack of an explicit monetary framework, the reserve bank has sustained a relatively stable exchange rate against the buck, which served as the effective nominal anchor for nearly three decades. Despite the accomplishment of shallow inflation, the trend of dollarization has not slowed or reversed. Ize and Yeyati (2005c)[192] write dollarization hysteresis (the persistence of dollarization after years of restrained inflation rates) can derive from the efforts to stabilize the exchange rate. They further found that if the actual exchange rate is compatible with inflation, the American dollar becomes the favored currency. Consequently, the stabilization of the exchange rate can force dollarization and not be aligned well with a strategy of de-dollarization.

Moreover, they further argue that enabling the exchange rate to be more pliable adapts relative risks in favor of national currency. Kokenyne, Ley, and Veyrune (2010)[193] also address that retaining tendency in the exchange rate could compel dollarization by entrenching a constant appreciation or depreciation expectation. They stated that currency flexibility in either direction, with less bias toward currency devaluation, helps make FX risk more apparent and gives a disincentive to dollarization. Given that the endogeneity of exchange rate policy, the policy alone is not adequate for de-dollarizing. It must combine with and place in the context of other approaches to encourage the usage of the national currency.

5.2.3. The domestic financial market

A broad and liquid local financial market offers flexible alternative investment opportunities to greenback deposits. In this regard, the initiation of domestic currency-denominated securities could reduce US dollar-denominated assets. In the losses of belief in home-currencydenominated assets, a believable indexation system (either to the exchange or inflation rates, such as in Chile, Columbia and Nicaragua,) can enhance such assets (Menkulasi, Erasmus, & Leichter, 2009)[194].

For example the improved market development has helped all Sub-Saharan countries weaken dollarization over time, reflecting some financial enlargement and the healthy growth in GDP over the last decade. Developing local capital markets in home currency is crucial to generate the afford of financial assets in national currency. This allows the invention of a deep FX market and will be vital if the home currency becomes flexible and the development of hedging instruments to internalize the costs of dollarization (Imm, 2020b)[195].

The Cambodia's money market needs to develop further to help lower risks concern with the credit dollarization to non-tradable sectors and consolidate the interest rate approach of monetary policy transmission: one of the principal priorities is to optimize the money market's potential to foresee and target short-term liquidity. Presently, in Cambodia, there is no interbank market, and its evolution should be an antecedence for the mechanism of monetary transmission and liquidity management.

Many steps are taken in developing the interbank lending market, containing (i) establishing Monetary Policy Committee's ability of national bank to define alley of interest rates for

collaterized rediscount facility, (i) flourishing the NBC's expertise to anticipate daily outstanding balances to checking accounts of financial institutions that will be utilized to set up open market operations, (iii) organizing auctions of NBC certificate to help manage excess liquidity.

Enhance the quality and expand the denomination of home currency. The largest denomination of national money is presently equal to the US $25. The previous banknote quality was low, making it difficult to apply the home currency for most non-trivial transactions, such as in Cambodia. The government's biggest challenge would be paying for new banknotes.

Inspire business agents to invest in assets denominated in home currency: Despite the likelihood of a modest nominal devaluation of the riel compared to the dollar in short to medium term, riel and USD bank accounts do not reward equal interest rate. Because interest rates are unrestricted, this phenomenon is liable caused by a short of demand from banks for home currency and inadequacy of trust in it as a standard of deferred payment by the private sector. It may shift longer as financial markets develop and new products emerge, such as national currency-denominated indexed instruments.

5.2.4. Prudential regulation and financial policy

Several steps could help expand domestic currency intermediation and set up a liquidity line of defense:

- First, limiting a larger required reserve on foreign currency liabilities increases the cost of such liabilities. Therefore, the liquidity concern of dollarization (deposit runs) connected with such deposits is reduced. A lower fraction of required on the national currency helps generate an encouragement to trade in Khmer riel. NBC currently has a greater foreign currency required reserves than for riel (the required reserve for riel was 8 percent and for foreign currency was 12.5%) (NBC, 2012) [196] . Nevertheless, This isn't enough on its adequate to guarantee a significant shift toward the utilization of riel.
- Secondly, initiating a deposit insurance scheme could enhance more reliability in the banking system. The insurance coverage for the domestic banknote should be put higher than the overseas currency.

- Third, must retain enough level of balance of payment. Reserve assets play a crucial role in a dollarized economy. In the event of bank runs, they work for the purpose of liquidity advocate to banks. High coverage of reserve assets helps to decrease the awareness of a weak currency.

Encouraging the usage of the riel as a unit of account; regulations could require that all market prices be expressed in riels. For all accounting transactions, financial reporting, and government purposes, the riel is used. Our Khmer riel has already been utilized for taxation, which is a positive step forward. Additionally, riel usage can be boosted by circulating higher denomination bills and instituting a tax clearing on checks designated in foreign banknotes.

Policies to promote the consumption of riel as a medium of payment by making it more convenient and less expensive than foreign notes could be pursued: to demoralize the operation of foreign currency for settlements, for example, Peru imposed a 2% levy on checks assigned in foreign bills. The home currency might also be encouraged by making it available in convenient denominations continuingly. A policy that raises the storage costs of money or one that taxes specific transactions can affect currency acceptance decisions. Association with policy implementation, storage costs might be seen as reserve requirements or macroprudential policies that central banks typically apply. Evidence on emerging economies indicates the implementation would be more straightforward in the case of macroprudential policies for independent central banks than introducing a tax on transactions in multi-currency. For example, Argentina implemented a tax on foreign currency transactions, chiefly in dollars (Vidal et al., 2020)[197].

Multiple currencies add to banking sector vulnerabilities coming from currency mismatches, credit risk and exchange rate, and dollar non-performing loans, and risk-based supervision should assist better in monitoring risks incurred by banks when issuing credit. Banks should be subjected to strict regulations on foreign currency lending risks, accompanied by risks revealed to borrowers (Kokenyne, Ley, and Veyrune, 2010). The fast expansion of credit that drove inflation between late 2007 and early 2008 underlined the need for prudential controls and riskbased financial supervision.

Prudential supervision requires greater distinction. For instance, we introduce various collateral proportions and debt coverage ratios. Essentially in the most vulnerable segments such as consumer and short-term credit, restricting the allocation of multiple currency lending

in the most susceptible segments), arranging large-scale campaign to boost the domestic currency as the means of payments, by including the preventing the establishment of prices (tariffs, tax, and other payments) in a foreign currency.

5.2.5. Measures to encourage the use of Riel

It is time for Cambodia to lay down effective monetary policies to protect the country from shocks to support the economy that it may spread sustainably. Therefore, we should deal with some policies to encourage the adoption of riel to strengthen the economy's expansion. The considerable procedures or measures to promote the use of KHR riel would donate extensively to government policy formulation to support sustainable economic growth.

5.2.5.1. Incentive the use of Riel

The income of state-owned enterprises that provide utilities, including water and electricity, is exclusively in riel. They must still convert the KHR to USD to pay their vendors. They may be manifested to exchange rate losses and hazards as a result of these currency mismatches.

MFIs are attempting to mitigate the risk of currency mismatch by issuing credits in the same currency as their funding source (deposits and borrowing). The actions of micro-financial institutions imply that they are transferring the risk of currency mismatch onto the borrowers.

The encouragement of the use of the domestic currency for loans is also justified in this situation.

According to Sok Voeun, the interest rate is comparable while taking on a loan from outside the country, and we can access the native money in financial institutions. We incentivize residents to save in riel, and we offer a special rate for those who open their savings in domestic currency and for whom sources of income are to be paid in riel currency. We encourage riel borrowing with interest rates comparable to USD rates. In some situations, the interest rate for riel borrowing is set lower than the rate for USD-based borrowing. MFIs try to reduce taking out of loans in the US dollar by borrowing in riel and releasing loans in domestic currency to align with short to medium and long term strategies (Khmer Times, 2021)[198].

5.2.5.2. Enhance confidence in Riel

The first step should keep inflation manageable, and the riel should not be devalued intemperately. Till now, the stable exchange rate between the riel and the US dollar has served as an anchor of price stability and strengthened public confidence in the Riel. However, a more flexible exchange rate driven by economic fundamentals, with a tendency toward riel appreciation, is reasonable in the medium- to long term.

The Monetary Policy Committee of Cambodia (MPCC) will persist in stabilizing the exchange rate based on real economic change and enacted to continue boosting awareness of riel usage and follow through on enforcement requiring banks and micro-financial institutions to have at least 10 percent of their total outstanding loans in the national currency. Furthermore, according to In Channy, chairman of the Cambodian Association of Banks (CAB), Cambodians adopt the riel because of its familiarity - the ability to replace it if it is torn or otherwise destroyed. Most importantly, the high yield it delivers on deposits. Preferential loan interest rates would also benefit the demographic (Khmer Times, 2021)[199].

5.2.5.3. Improve price quotations on goods and services payments in Riels

The lines of ministries should moderately incentivize firms and sellers to quote the price and payments of goods and services in home currency and promote the payments of salaries and wages in national currency. These measures should progressively begin in both the public and private sectors. Ministry of Commerce (2017)[200] updated the existing old regulation since 2003. It states that "All goods and services offered in Cambodia must have price tags, and they must be in Riel," as seeing the essence of using the domestic currency in the economy. In other words, the regulation does not clear about the punishment when the business agents do not follow the rule, and it seems not firmly effective for implementation. In cooperation with the RGC, NBC plays an essential role as the monetary authority to ensure impartiality for buyers and sellers when the riels are used to pay for goods and services. When the fair and suitable exchange rate is determined, this can be used as strategies to work for the operation in local currency and reduce the use of the greenback and the level of dollarization. Moreover, this strategy might have convinced the residents who receive income in riel do not have to convert to US dollar, and payment directly is made in the riel (Lim, "n.d")[201].

5.2.5.4. Advance the opening of bank accounts in Riels

Reward firms or companies open bank accounts in riel and encourage domestic currency and general riel usage in salary payments. It would lower cash holdings and the hazards that come with them while also making it easier to use the Khmer riel through various payment methods. It could also address issues about the inconvenient nature of having too much domestic currency on hand to make significant payments or about the riel banknotes having too many zeroes. To achieve this end, the government, financial institutions, and companies should encourage the utilization of bank accounts denominated in Riels.

5.2.5.5. Improve the payment system and financial tools in Riels

The payments system is a critical part of the financial system's infrastructure that could diminish cash-based transactions. Additionally, it promotes the greater use of national currency if the system is designed to favor riel. Recently, an electronic retail payment system in the domestic currency has been introduced. And banks should put riel banknotes in their ATM with a few denominations suitable for usage for day-to-day activities like (10,000 riels, 20,000 riels, and 50,000 riels, further 100,000 riels). Moreover, to increase the value of the riel banknotes in circulation, NBC should consider producing larger denominations (for example, 400,000 Riels, equivalent to roughly 100$). As the value of financial and economic transactions tends to increase, NBC should issue larger denomination banknotes to meet the demand for higher-value notes. Finally, to reduce the direct usage of foreign currencies, money transfers or remittances should be made through established financial institutions or the engagement of agents.

5.2.5.6. Promote financial intermediation in Riels on a gradual basis

Typically, MFIs operate in riel as they provide more financial services to the poor than the formal banking system. Hence, banks and micro-financial institutions should incentivize measures taken to broaden their financial intermediaries in riel.

Given the growing number of dollarized countries, financial institutions must gently extend the share of their operations conducted in local currency. Subsequently, the central bank should consider promoting and forcing banks and financial institutions to operate in riel to a

certain degree. In 20017, the central bank mandated that microfinance institutions and rural credit operators should not charge interest rates not exceed 18 percent per year for any loan maturity operators (NBC, 2017) [202] . To do this because most rural debtors borrow funds from communities, and NBC wants them to access financial services reasonably. Further, OpenUCT (2017)[203] indicates that interest rate ceilings are often discussed as a practical approach to inhibiting lenders from charging immoderate interest rates. Still, Setting the rates too low may result in institutions not being able to cover their costs. Lowering interest rates may pressure MFIs to cut expenses, increase loan sizes, withdraw services from high-cost locations, or exit the market entirely. In January 2013, Zambia imposed a 42 percent interest rate ceiling of lending interest rate on microfinance institutions (Philippine News Agency, 2020)[204].

Khmer Time (2018) [205]states that advancing hedging tools enable banks and financial institutions to get riel liquidity when their sources of funds are in foreign currency. By making credit available in the domestic currency to commercial banks and microfinance institutions, the LPCO tools attempt to increase the riel liquidity of the country. Through its liquidity-providing collateralized operation, NBC has disbursed more than 238 billion riels ($58.5 million) in 2018's first half.

In particular, broaden the reserve requirement ratio on riel and US dollar deposits so that riel is more readily available to financial institutions for credit distribution. Starting in April 2020, the Reserve Requirement Ratio (RRR) was diminished by NBC from 8% for national currency and 12.5 percent for foreign currency to 7% for both domestic and foreign currencies for six months (NBC, 2020)[206]. In order to entice the segment of households, the authority should grant deposit schemes that promote riel deposits. This type of project may offer better preferential interest rates than the market rate and be structured; consequently, individuals who save in such a scheme for a longer period of time may be eligible for preferential riel borrowing. According to the policy, as mentioned above, the Phillip Bank offered a greater interest rate on riel deposits as 16 percent per year for maturity 18 months up.

5.2.5.7. Enhance foreign exchange markets

We need a legal wholesaler of the FX market to absorb foreign currency inflow and deliver it when demand responds to the importer and other worldwide transfers. Because Cambodia’s

foreign exchange market is predominantly a retail one rather than a formal one, foreign currency inflows can conduct outside the banking system. Subsequently, their transactions are principally in cash, and this favors the persistence of dollarization. According to Kou and Okuda (2017), NBC should further set up the foreign exchange market in the direction of the wholesale and formal market in which banks play a crucial role in responding to the demand for Riels and efficiently absorb foreign currency inflows from the economy.

5.2.5.8. Further developing interbank and money markets

The formal interbank lending market would authorize banks and financial institutions to manage riel liquidity better and enhance them to use home currency in their operations is underdeveloped. Several large banks are involved, there are established relationships through credits and deposits; alternatively, there are constrained, and at the same time, the market lacks several essential instruments.

NBC has paid great attention to the establishment of the market through the commencement of a new tradable debt instrument, the Negotiable Certificate of Deposit (NCD). Moreover, the inauguration of the Liquidity-Providing Collateralized Operation (LPCO) project aims at allowing local financial institutions to borrow funds in riel at low-interest rates to cover their payments and service obligations using NCD as collateral. A practice the NBC is keen to promote along with greater adoption of riel currency (B2B, 2016)[207]. These operations may help Cambodia's interbank and money markets flourish. The method also offers the national bank indirect influence over the country's money supply to establish a benchmark interest rate. Treasury security in home currency, in particular, should be introduced to boost riel demand.

But, we encounter some principal challenges such as the lack of confidence among financial establishments, unavailability of other financial instruments such as government bonds, and infrastructure of the interbank market is still limited even if the regulatory laws and platforms are subsequently in place. Therefore, we have to build up confidence among banks, and introducing government security is a vital step in order to improve the current inactive interbank market. Design brokers in the interbank lending market due to small transactions between banks that cannot give enough commission to brokers. NBC can help by developing a team that plays a primary role as brokers, matching the financial institutions that intend to supply funds with ones needed funds in the market. In response to this matter, Cambodia

Microfinance Association can also act as a broker to provide credit guarantees for its members to build up reliability on financial institutions. They were further improving the NBC platform to allow banks and financial institutions to transact directly and smoothly with each other.

5.2.5.9. Beyond progress securities market

There have been eight firms with a stock exchange listing since the security market was established. In other words, the first challenge of the security market in Cambodia is most businesses are unprepared for the stock exchange in terms of transparency and tax compliance. Second, the security sector must compete with the real estate industry, which profits from speculation and often haphazard development. Third, the general population in Cambodia is still unaware of the situation. Fourth, supervisory authorities must provide more support to help boost this sector (Cambodianess ThmeyThmey, 2019)[208].

In the future, when the government calls for sustainable financing, it should seek options for long-term investment plans that local debt financing will reduce dependence on foreign debt. And it diminishes risks associated with exchange rate fluctuations such as those the government is currently facing. The Phnom Penh Post (2021)[209] describes two main challenges of the capital market we tackle and need to overcome. On the supply side, there are still a few financial options available onboard. Even though we have eight equities and nine bonds listed companies, the total is still small. Bonds do not contribute as much to the secondary market as equities do. We require more stock and other new participants. The top and fundamental difficulties to be resolved include low stock valuation, high IPO (initial public offering) costs, and tax issues. On the demand side, even if liquidity has increased, it must maintain a certain level to capture the attention of foreign investors, distinctly institutional investors.

5.2.5.10. Fiscal support for the Riel

The budget system is one of the key grounds for intensifying the use of home currency because enthusiasm and positive attitudes from the government are prerequisites for public awareness and understanding of commitment to change. The government may have a significant role to play in creating demand and supply in local currency through fiscal measures. Afterward, public sector income from taxes and non-taxes is mostly in national

currency. However, some profits are still collected in US dollars, such as entrance fees to tourism sites, airport taxes, visa fees, rents, etc. On the expenditure side, though all public wages are in home currency, some public consumption and most public investments are paid in foreign currencies. If all revenue collection and payments for consumption and investment are in riels, the government would increase the demand for, raise the supply of riels in the economy, and consider expenditure associated with donorassisted or NGO projects.

Phnom Penh Post (2019)[210] states that It will be time to conductive to push the government's riel program as macro-economic parameters of Cambodia illustrate that the current market is relatively ready for the national currency to be the primary medium of exchange. The ratio of Cambodia riel in household and enterprise income and expenditure increased slightly between 2014 and 2017, according to a joint poll by NBC and the Japan International Cooperation Agency (JICA). By mobilizing resources in home currency, the government may also establish a market skeleton in riel to offer financial support for infrastructure development and minimize foreign debt.

5.2.5.11. Promote public awareness and participation

The public has to be conscious of the roles and usefulness of the native money and the government's policies and promote the preferential use of the national currency. NBC integrates with the Ministry of Education to teach financial literacy as a school subject to increase students' understanding of money. Usually, the Riel Day Campaign celebrates the anniversary of the re-introduction of the riel was organized in different locations, including universities and shopping malls. Raising youth's affection toward riel is still a big challenge. NBC opens for the public to visit the Preah Srey Icanavarman Museum, known as the SOSORO Museum, dedicated to the Kingdom's currency and economic history. Also, many financial institutions help promote riel awareness of young people, like providing a higher interest rate on saving accounts in riel to attract them to adore their currencies (Khmer Times, 2021)[211].

5.2.5.12. Intensify cooperation for the execution of the successful measures

Finally, promoting home currency usage is a macroeconomic issue that needs collaborative efforts to arrange and perform consistent policy and actual measures. Meanwhile, the cooperation framework must cover all relevant parties' inputs in the public and private sectors. Hence, national policies to inspire the adoption of riel are needed to urge the partnership of all stakeholders. Like the Ministry of Education should require private and public schools to get tuition fees in national currency, the Ministry of Tourism should advise all agents' tours to accept only domestic money and so on.

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ABBREVIATION

- ADB : Asian Development Bank
- AFC : Asia Financial Crisis
- ASI : Assets Substitution Index
- ATMs : Automatic Teller Machines
- AIC : Akaike Information Criterion
- AMA : Repo Master Agreement
- BOK : Bank of Korea
- BOT : Bank of Thailand
- BRP : Bilateral Repurchase Agreement
- BND : Business News Daily
- CMA : Cambodia Microfinance Association
- CPI : Consumer-Price Index
- CEECs : Central and Easter in European Countries
- CDC : Council of Development for Cambodia
- CSI : Currency Substition Index
- EBAs : Everything but Arms
- EDC : Electricite du Cambodge
- ECB : European Central Bank
- ESAF : Enhanced Structural Adjustment Facility

- FI : Financial Institution
- FX : Foreign Exchange
- FCC : Foreign Currency in Circulation
- FEFSA : Foreign Exchange Fund Special Account
- FCD : Foreign Currency Deposits
- FSR : Financial Stability Review
- GDP : Gross Domestic Products
- GSPs : Generalized System of Preferences
- IRF : Impulse Response Function
- IMF : International Monetary Fund
- IRF : Impulse Response Function
- KPI : Key Performance Indicators
- LIBOR : London Inter Bank Offered Rate
- LPCO : Liquidity Providing Collateralized Operation
- MEF : Ministry of Economy and Finance
- MDI : Microfinance Deposit-Taking Institutions
- MFIs : Microfinance Financial Institutions
- MLF : Marginal Lending Facility
- NBC : National Bank of Cambodia
- NCD : Negotiable Certificate of Deposit
- NPLs : Non-Performing Loans
- NSDP : National Strategic Development Plan
- OCC : Office of the Comptroller of the Currency
- OMO : Open Market Operation
- OSD : Offshore Depository Accounts Held by Domestic Residents
- P.D.R. : Lao People's Democratic Republic
- RBI : Republic Bank of India
- REPO : Repurchase Agreement
- RRR : Reserve Requirement Ratio
- RS : Rectangular Strategy
- RGC : Royal Government of Cambodia

- SMEs : Small and Medium-Sized Enterprises
- TD : Total Deposit
- UNTAC : United Nations Transitional Authority in Cambodia
- VAR : Vector Autoregressive Model

TABLE

FIGURE

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