2020 BOK Knowledge Partnership Program

with Cambodia

Monetary Operations and FX Policy

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Monetary Operations and FX Policy

BANK OF KOREA

서울대학교 산학협력단
SNU R&DB Foundattion

National Bank of Cambodia

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Executive Summary

The Cambodian economy since the mid-1990s has shown strong annual growth in the range of 7–8 percent. Furthermore, its macroeconomic stability is seen through a stable inflation rate of around 3 percent and a non-volatile foreign exchange (FX) rate. Despite the superb performance of the real economy and macroeconomic management, the underdeveloped financial sector remains a serious challenge for the Cambodian economy. Continued weakness of the financial sector could raise skepticism over Cambodia staying on the path of sustainable economic development. The country's heavy reliance on U.S. dollar in regular trading and financial asset transactions (e.g., over 80 percent of bank deposits are in USD) substantially limits the autonomy of Cambodian monetary authorities. This high dependence on U.S. dollar makes it difficult to implement effective monetary policy to manage the business fluctuations and to respond potential financial crises. Without effective instruments of monetary policy, proper provision of liquidity and credit to the real economy is difficult and the growth of real sector is vulnerable to financial or external shocks. Because high dollarization is a critical barrier to sustainable development, weaning Cambodia off the greenback is a crucial challenge in order to continue the country's economic growth.

Yet simple de-dollarization incurs the risk of rattling Cambodia's sound macroeconomic stability unless the institutional and operational frameworks for monetary and foreign exchange policies and the supporting financial instruments are sufficiently developed. This report focuses on the development of institutional and operational frameworks for both types of policies and financial instruments to ensure effective progress of the Cambodian economy toward gradual and successful de-dollarization.

This report is divided as follows. Chapter II provides discussions on designing foreign exchange policy for Cambodian monetary authorities to achieve de-dollarization. This chapter assesses the Cambodian foreign exchange market and studies the determinants of USD-denominated deposits, which would illuminate the current conditions of the Cambodian dollarization. Combining this analysis with the Korean experience in foreign exchange policy, the recommendation is that Cambodia gradually shift its de facto fixed exchange rate regime to a more flexible floating exchange rate regime, being backed by macro-prudential policy to minimize the risk of financial disturbance.

Chapter III discusses setting the policy rate for effective monetary policy in Cambodia, reviewing the country's monetary policy framework and instruments focused on negotiable certificates of deposit (NCDs), the liquidity-providing collateralized operation (LPCO), and the marginal lending facility (MLF), and comparing them with the monetary policy framwork of Korea. Several policy instruments are suggested to strengthen open market operations in Cambodia such as expanding the LPCO to a repo market, the development of long-term NCDs, and the introduction of a government bond market.

Chapter IV explores practical methods to promote FX and currency swaps as risk management instruments for facilitating the implementation of the foreign exchange and monetary policies. The development of Cambodia's swap market is reviewed and potential lessons from the Korean experience in such development are applied to the Cambodian case. The chapter also recommends how Cambodia should build the infrastructure for an FX trading platform and promote market makers, along with support policies.

I. Introduction

1. Summary of KPP Cambodia

Cambodia has a population of 16.7 million, is located in the lower Mekong River of the southern Indochina Peninsula, and is undergoing a transformation from an agricultural-based economy into one oriented toward manufacturing and the service sector. The country during 2015–19 showed annual growth of an average 7.1 percent, with inflation also stable at around 3 percent over the same period. Such rapid but stable growth is mainly due to increases in domestic demand and exports. Consumption in Cambodia is being driven by high wage growth and public investment and foreign demand for exports by shipments of clothing and footwear products and an influx of tourists from China.

Despite stable growth, the Cambodian economy is facing difficulty in implementing monetary policy due to its high dependency on USD. The Cambodian riel (KHR) and USD are both used in the country, but the latter is far more dominant. The Cambodian payment and finance sectors are highly dependent on USD, and more than 80 percent of loans and deposits at Cambodian banks are in the American currency. In addition, the KHR-USD exchange rate is generally fixed and thus the fluctuation range is always stable. Thus dollarization of the Cambodian economy has had a positive effect on stable inflation and the country's international credibility, but can pose problems such as making independent monetary policy difficult and reducing seigniorage. Thus the Cambodian government and the National Bank of Cambodia (NBC) must carefully consider what the proper policies are.

Specifically, the Cambodian economy's high USD dependence and the low circulation of the domestic currency KHR have resulted in the link of the country's market interest rate to that of the US Federal Reserve, and thus the NBC cannot independently devise a policy rate. In addition, high dollarization limits the central bank's role as the country's ultimate lender, exposing the economy at large to the risk of speculative redemption because of the fixed exchange rate.

Meanwhile, the Cambodian government and the NBC are seeking to lower the

economy's dependency on the greenback by requiring loans to have a certain ratio of KHR and fostering use of the domestic currency on the financial market. These efforts have born little fruit, however. Against this backdrop, the NBC requested policy advice on the theme "Monetary Operations and FX Policy" based on Korea's experience, through the 2020 Bank of Korea Knowledge Partnership Program (KPP). The program has three sub-sections: 1) devising foreign exchange policy to achieve the policy objective of de-dollarization; 2) setting the policy rate for effective monetary policy in Cambodia; and 3) promoting currency and FX swaps.

2. Progress in KPP Cambodia

The Bank of Korea (BOK) selected Seoul National University's (SNU) Research and Development Business Foundation to implement the KPP with Cambodia in 2020 through open competitive bidding. The foundation comprises experts from various fields as shown in <Table 1-1>. A highly qualified research team was formed based on each member's expertise in Korea's financial and monetary policies and experience gained from projects related to the Cambodian economy. In addition, experts including SNU professor Moon Woo Sik, a former member of the BOK's Monetary Policy Board, were invited to provide more insightful and effective advice on policy.

<Table 1-1> 2020 KPP Cambodia Research Team

Theme	Researchers
Devising FX policy for policy objective of de-dollarization	Yeo Eunjung (Chung-Ang Univ.)
Setting policy rate for effective monetary policy in Cambodia	Kim Young Sik (Seoul Nat'l Univ.)
Promoting currency & FX swaps	Kang Kyeong-Hoon (Dongguk Univ.)

Because of the COVID-19 pandemic, this year's KPP with Cambodia could not hold major events such as field trips to Cambodia and Cambodian researchers visiting Korea.

Accordingly, most activities were done through videoconferencing after consultations with the BOK and the NBC. Major events were promoted through videoconferencing, but substantial efforts went toward conducting the research as accurately as possible through active communication between Korean and Cambodian researchers and the establishment of an online data-sharing platform. The project remains at the middle stage, and if the COVID-19 situation improves, the final reporting session will be held in Cambodia. The main activities carried out so far are as follows.

A. Preliminary Meeting

On April 29, 2020, the project held its preliminary meeting via videoconferencing. Participants from the BOK, the NBC, and the foundation's research team discussed issues including the project's background and purpose and introduced both the Korean and Cambodian researchers. In addition, the Korean researchers specified the NBC's demands through a Q&A session, in which both sides agreed to prioritize the development of policy tools to lower dollarization in Cambodia over the short term, rather than give mere policy advice. The NBC also requested policy recommendations for the short to medium term rather than a long-term plan. Finally, discussions focused on the recommendations of Cambodia-based experts by field and schedule. The list of variables needed for the study was clarified through discussions on available data, and the terms of reference (TOR) were concluded to specify tasks for the NBC's research participants and reward system by research theme, as shown in <Table 1-2>.

<Table 1-2> 2020 KPP Cambodia Research Team (NBC)

Theme	Researchers
Devising FX policy for policy objective of de-dollarization	Lay Sok Heng (NBC) Nob Pechsreyleak (NBC)
Setting policy rate for effective monetary policy in Cambodia	Chea Yuthan (NBC) Vann Tolakham (NBC)
Promoting currency & FX swaps	Long Vibunrith (NBC)

B. Kickoff Seminar

Early in the project, Korean researchers sought to make a field trip to Cambodia in late June. Because the COVID-19 situation did not improve, however, both the field trip and the kickoff seminar were conducted through videoconferencing on July 28. Researchers from both countries shared their progress in the project according to the following sub-themes: 1) devising foreign exchange policy for the policy objective of de-dollarization; 2) setting the policy rate for ensuring effective monetary policy in Cambodia; and 3) promoting currency and FX swaps. They confirmed that the data necessary for writing research reports will come late and agreed to remain flexible according to the COVID-19 situation vis-a-vis the schedule of progress and to give notice of all schedules.

C. Interim Seminar and Capacity Building Workshop

On September 25, 2020, the Interim Seminar was held as a videoconference. The researchers from both nations exchanged feedback on the interim research results and discussed the content to be included in the final report. Due to the pandemic, the seminar was conducted online but participants from both sides still confirmed cooperation through two-way communication and the taking of group photos.

The Capacity Building Workshop was held in two rounds of six sessions considering the schedules of Korean instructors and Cambodian participants. To ensure an effective workshop, the SNU research team invited top-rated Korean experts in currency and foreign exchange. Each session helped raise not only the theoretical competency of participants but also their practical capacity, and the Cambodian side expressed high satisfaction with the workshop.

<Table 1-3> 2020 Cambodia KPP Capacity Building Workshop Program

Date	Program	Lecturer
September 22	Lecture (1) Theory and Practice of Monetary Policy: Focusing on Fed	Jinill KIM (Korea Univ.)
	Lecture (2) Exchange Rate: Theory and Policy	Soyoung KIM (SNU)
September 23	Lecture (3) Monetary Policy under De-dollarization	Woosik MOON (SNU)
	Lecture (4) Status of Interbank Swap Market, Consideration for NBC Swap Market	Woong Ryeol KIM (Bank of Communications)
October 22	Lecture (5) Monetary Policy Effectiveness under Dollarization, Case Studies on De-Dollarization Policies	Jong Chil SON (Hankuk Univ. of Foreign Studies)
	Lecture (6) Implementation of Monetary Policy in Korea	Dongwook SHIN (Sang-Myung Univ.)

The lecture dubbed “Theory and Practice of Monetary Policy” focused on the roles of the central bank and monetary policy based on the case study of the US Federal Reserve. During the lecture “Exchange Rate: Theory and Policy,” participants held in-depth discussions on the types of exchange rate policies and institutions. “Monetary Policy Under De-dollarization” was a lecture on policy mechanisms for de-dollarization, and discussion of the topic “Status of the Interbank Swap Market and Consideration of the NBC Swap Market” provided consultation on the policy direction of the NBC, along with practical knowledge on swap markets. And the final lectures “Monetary Policy Effectiveness under Dollarization and Case Studies on De-Dollarization Policies” and “Conduct of Monetary Policy in Korea” centered on monetary policy as implemented in Korea and other countries.

D. Final Seminar

The Final Seminar is scheduled for December 2, 2020. The NBC had requested the event's postponement from November due to COVID-19. Accordingly, the contract for the event was extended after consultation with and approval by the BOK to allow its rescheduling. The seminar will share the final results of the KPP with Cambodia and discuss plans for policy implementation by the NBC. In addition, selected panel of external experts who participated in the capacity building workshop will serve as commentators in the Final Seminar to provide advice to improve the quality of the final report. We will also collect the overall feedback from the NBC about their learning experience and the help that they get from the BOK KPP with Cambodia, so that we can identify the issues that would help improving on future BOK KPP projects.

3. Implications and Expected Results

The Cambodian economy is seeing rapid development of its financial sector, so stable management of the industry is crucial. The country's high dependence on USD for payments and assets imposes fundamental restrictions on financial policymaking and implementation, especially for monetary policy and foreign exchange. Cambodia's dollarized economy posed little problem before due to the solid growth of the real economy, but reliance on the greenback amid the process of a developing economy due to rapid growth has accelerated rather than declined despite stable inflation management. Furthermore, dollarization is evolving in a direction that renders independence in devising monetary policy practically impossible.

The Cambodian economy seeks to develop its financial system and infrastructure to resolve these challenges as well as achieve de-dollarization. Because of the high dependence on the greenback, however, pushing for a de-dollarization policy under the country's existing economic structure is difficult. Another problem is the uncertain

impact of de-dollarization on the real economy, but a more fundamental issue is how Cambodia should pursue monetary and foreign exchange strategies while pursuing de-dollarization. Because the NBC has had limited experience in implementing policy in both sectors, proper understanding of these issues must precede the setting of principles for policy instruments and institutional infrastructure.

The KPP with Cambodia assesses the country's monetary and foreign exchange policies, reevaluates them from the perspective of de-dollarization, and shares analyses of Korea's experience to improve the effectiveness of Cambodia's policy actions. This will not only stimulate the use of the Cambodian currency KHR but also enhance the effectiveness of the NBC's monetary and foreign exchange policies. This will eventually allow the Cambodian economy to enter the stage of "sustainable economic development" from that of "early leap" based on macroeconomic stability.

Specifically, the project seeks solutions to the following three topics for the development of Cambodia's monetary and foreign exchange policies. First, what is the most effective foreign exchange policy for pursuing de-dollarization and how can it be implemented? Second, a proposed mechanism would see the setting and adjustment of policy interest rates for the NBC to effectively implement monetary policy. Dollarization means management of the foreign exchange rate is ultimately in the hands of inflation policy, but when pursuing de-dollarization, the recommendation is to implement monetary policy in a way to prevent the collapse of price stability. And third, the project proposes setting up and running a swap market to tackle the instability of the Cambodian currency's value, which could occur if the market exchange rate fluctuates while de-dollarization is being pursued, as well as the potential for instability in the financial market's liquidity supply. In addition, policy means for operating FX and currency swaps will be presented considering the structure of the Cambodian financial sector.

In addition to the recommendations mentioned above, this advisory program has Korean and Cambodian researchers studying all three topics related to monetary and foreign exchange policies. And a capacity-building training program aims to strengthen the competency of NBC staff.

By achieving the aforementioned goals through knowledge exchanges between the central banks of both countries, the KPP with Cambodia has as its ultimate goal the development of goodwill and understanding between Korea and Cambodia through boosting “win-win” economic exchanges and external cooperation.

II. Foreign Exchange Policy toward De-dollarization Goal

1. Background

Forty years after its rebirth, the National Bank of Cambodia has encountered both success and challenge.[1] Among its main achievements were its relaunch from scratch and the reissuance of the domestic currency riel (KHR) after a five-year absence from circulation during the nation's civil war.[2] Soon after its currency liberalization in January 1979, Cambodia had neither a central bank nor a national currency, so people resorted to bartering using gold, jewelry, or even goods.[3] When the KHR was re-issued on March 20, 1980, the public welcomed the new banknotes because they offered better settlement options than bartering. Yet in certain parts of the country, bartering remained in practice throughout the 1980s. The reconstruction of the central NBC and the banking system was quite challenging, with a lack of sufficient physical and human resources due to the killing of many intellectuals by the Khmer Rouge. With little knowledge, expertise, and experience, the country found it impossible to restore its banking system to its level before 1975. Twenty years after the revival of both the NBC and the domestic currency, sweeping fiscal reform in Cambodia has allowed a plethora of legal tools, expertise, and mechanisms to be used in the implementation of monetary policy.

The NBC, however, faces lingering challenges that hinder its ability to further advance the economy. A major obstacle is the high use of foreign currency in the economy. Public confidence in KHR eroded when the banking system collapsed and the national currency was abolished under the rule of Khmer Rouge leader Pol Pot, leading to the use of other

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1) The National Bank of Cambodia (NBC) was established in 1954 after the country gained independence from France. Political upheaval and civil war forced the central bank to close in the mid-1970s, however, leading the collapse of the Cambodian banking system and the abolition of the national currency. The NBC was relaunched on October 10, 1979.

2) The central bank was called the People's Bank of Kampuchea but its name was restored to the original National Bank of Cambodia on January 30, 1992.

3) Some people hid or buried gold chains or jewels before evacuating from cities to the countryside. After the Khmer Rouge fell, they recovered their valuables by digging them up.

currencies like the USD, THB and VND in Cambodia. The lack of a Cambodian currency was highly associated with slow economic recovery after the country's liberation. Foreign currencies were used during the 1980s, especially in border areas, alongside the domestic currency. The use of foreign currencies, especially USD, emerged as a nationwide phenomenon in 1991, when peacekeeping forces of the United National Transnational Authorities in Cambodia (UNTAC) came to Cambodia to organize the country's first election and brought an estimated USD 1.7 billion (Tal and Dabadie 2007).[4] Given the weak confidence in KHR and hyperinflation as well as huge fluctuations in the foreign exchange rate in the early 1990s, the greenback was the Cambodian public's choice for use in savings and daily transactions.

Gardère (2014) describes the 1980–91 period as "wasted growth and the beginning of liberalism." The Cambodian economy was initially collectivized and centrally planned under vague political ideology. The domestic currency was reintroduced six months after the NBC's reestablishment, but real confidence in KHR did not return during the period before the Khmer Rouge took over. Initially, the national banking system had a mono nature in which the NBC performed both central and commercial banking functions. In the late 1980s, several measures sought to open up the economy and attract foreign investment, including reform of the banking system and linkage of the foreign exchange rate to the market. These structural reforms led to the reconstruction of the two-tier monetary and banking system. Gardère (2014) said the 1992–97 period marked "an advance toward a liberal market economy and macroeconomic stabilization." The two main issues were hyperinflation and dollarization. In the early 1990s, government revenue depended mainly on financing from the central bank given low tax revenue and a shortage of international assistance. Tal and Dabadie (2007) found that the huge increases in money supply of 241% in 1990 and above 200% in 1992 sharply devalued KHR and resulted in three-digit hyperinflation.[5] As a result, macroeconomic

4) The amount of USD inflow was equivalent to two-thirds of GDP in 1993 and not converted into KHR before circulation.

5) In addition, millions of USD from 1992 to 1993 were injected into the economy by UNTAC. Furthermore,

stabilization and market liberalization required the standardization of the Cambodian banking system.

The NBC conducted sweeping reforms including the adoption of a genuinely liberal two-tier banking system in 1992, followed by the enactment of new laws and regulations.[6] A law on the NBC's organization and conduct adopted on January 26, 1996, stipulated the central bank's clear roles and duties and granted it autonomy. The Foreign Exchange Law of August 22, 1997, further backed this measure, followed by other laws and regulations. Furthermore, a variety of monetary policy instruments was developed to ensure price stability.

The high degree of dollarization, however, means the NBC cannot conduct monetary policy effectively. In a highly dollarized economy like Cambodia's, proper foreign exchange management is a key tool in monetary policy.

Cambodia has two types of exchange rates, the official one and that of the market. The official KHR-USD exchange rate is determined by the NBC's Official Exchange Rate Determination Committee and announced early on the morning of a working day.[7] The official rate, which is usually lower than the market's, is calculated based on the rates of the greenback against the national currency on at the three main markets in Phnom Penh —Olympic, Orussey, and Central—three times per day: morning (7 a.m.–8 a.m.), noon (1 p.m.–2 p.m.) and afternoon (4:30 p.m.–5:30 p.m.) using the average selling and buying rates (Pum and Vannak 2010).

The market rate is generally determined by KHR supply and demand, which are affected by seasonal factors. Figure 2-1 shows high demand for KHR to pay taxes, generally in March, followed by the Khmer New Year holiday in April, when people visit their hometowns. KHR demand rises again on the Pchum Ben holiday in September or

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based on the estimate by the International Monetary Fund, the Cambodian economy had roughly USD 1.2 billion in circulation in early 1995 and USD 2.9 billion in early 2001 (de Zamaróczy and Sa 2002).

6) After its relaunch, the Cambodian banking system was formally in one-tier form, in which the NBC was both the central and a commercial bank to provide loans, deposits, and payment transactions.

7) The Official Exchange Rate Determination Committee is comprised of staff from the departments of issuance, banking operations, exchange management, economic research, and international cooperation.

October and during the harvest season for trading agricultural products in November and December. In contrast, KHR depreciation mostly happens in August. Overall, the seasonal patterns of exchange rate movement in Cambodia suggest that the foreign exchange market relies more on cash-based retail transactions (Kubo et al. 2019).

<Figure 2-1> Daily KHR-USD Market Rates, January 2015 to May 2020

Source: National Bank of Cambodia

2. Overview of Cambodia's Foreign Exchange Market

The foreign exchange market in Cambodia has two major players: banks (commercial banks and MFIs) and money changers. Under Article 5 of the Foreign Exchange Law (1997), authorized banks can buy and sell foreign currencies from the market and conduct international settlements between residents and non-residents. Based on a *Prakas* (a Cambodian regulation related to banking or finance) on money changer licensing or authorization and existing laws and regulations, money changers must obtain before conducting business an NBC license or authorization to buy and sell banknotes and traveler's checks. Money changers, on the other hand, can be classified as licensed or authorized. Those who are licensed have more privileges than authorized money changers,

given that the former can participate in the KHR auction of the NBC and receive training in detecting counterfeit currency.[8]

The foreign exchange market in Cambodia is dominated by money changers and overshadowed by small retail transactions (IMF 2012; Kubo et al. 2019). As of late 2019, the country had 2,913 authorized money changers, with 38 licensed/authorized papers given to legal entities, 30 to banks, 26 to microfinance institutions (MFIs), and 2,819 to authorized money changers (NBC 2020). Within the last few decades, the number of businesses has jumped significantly as that of licensed banks, MFIs, and other legal entities have increased tenfold, while the number of authorized money changers has surged 300% (Table 2-1). A combined 2,764 authorized money changers were in the provinces, including 500 in Kampong Cham, 416 in Kampong Speu, and 311 in Siem Reap (Figure 2-3). Yet some money changers did not apply for either license or authorization in the foreign exchange market. Most of these unofficial operators are small and their transactions are mostly between USD and KHR.

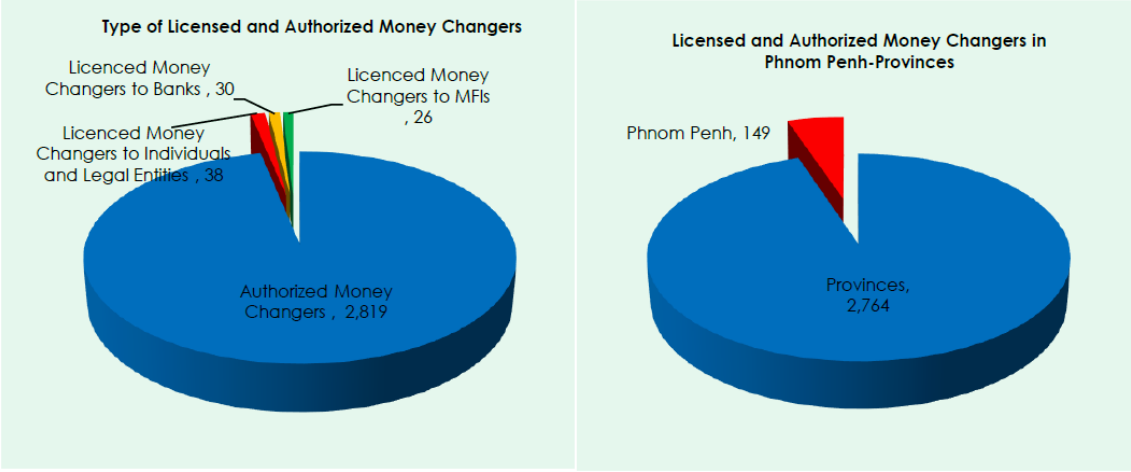
8) A *Prakas* (banking or financial regulation) released in October 2009 required anyone applying for a money changer's license in Cambodia to have a minimum paid-in capital of KHR 80 million (approximately USD 20,000) kept with the NBC permanently and pay a licensing fee of KHR 1.2 million (USD 300). To obtain an authorization document, however, no minimum paid-in capital is required, but the annual fee is KHR 200,000 (USD 50). Appendix II. A provides detailed information on the requirements and rights of licensed and authorized money changers.

<Table 2-1> Types of Money Changers in Cambodia 2010–19

No	Type	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
1	Licensed (bank, MFI, legal/natural person)	9	39	73	66	69	77	71	77	73	94
2	Authorized (approval document)	974	1,588	1,532	1,610	1,706	1,933	2,322	2,401	2,706	2,819

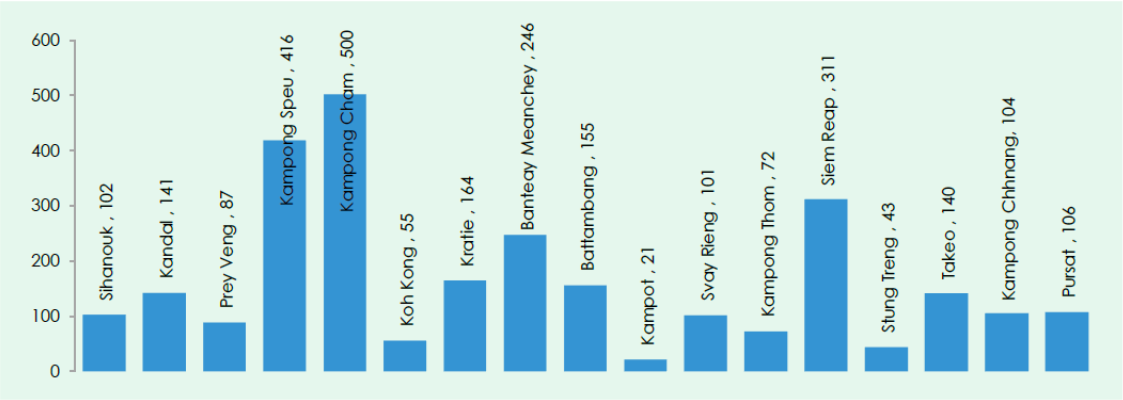
Source: NBC's Annual Supervision Report 2010–19

<Figure 2-2> Types of Licensed and Authorized Money Changers in Cambodia in 2019



Source: NBC's Annual Supervision Report 2019

<Figure 2-3> No. of Authorized Money Changers in Cambodian Provinces



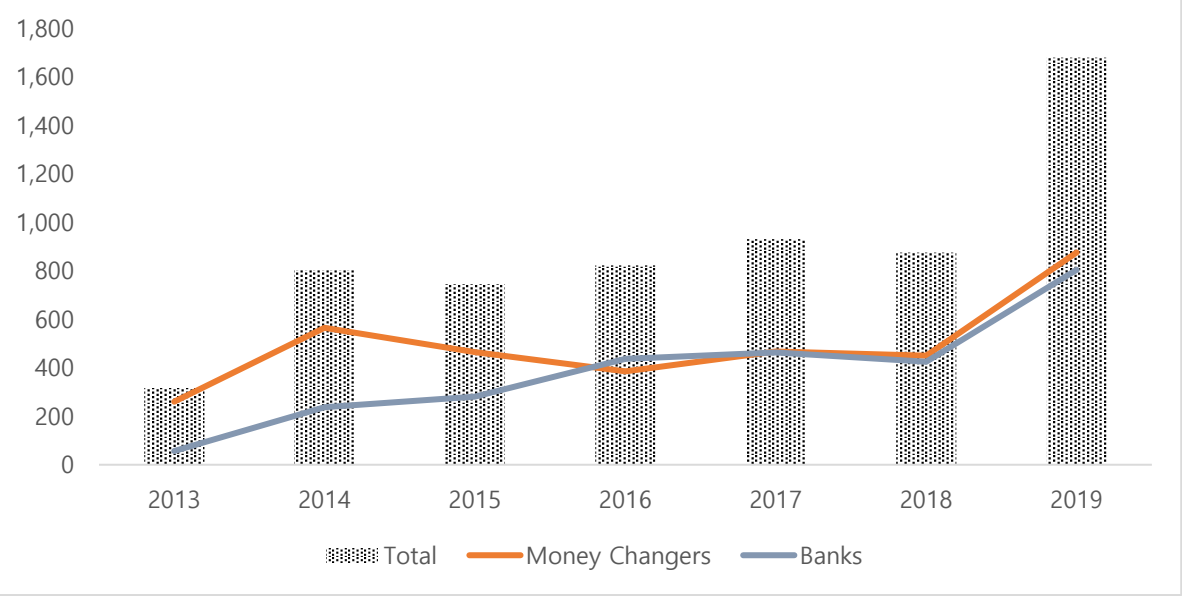
Source: NBC's Annual Supervision Report 2019

In Cambodia, money changers are more popular among the public for buying and

selling foreign currencies than banks (Kubo et al. 2019). This is because money changer stalls are conveniently located near markets or main streets and customers need not fill out documents. More importantly, money changers are seen to offer more competitive foreign exchange rates than banks. Yet the difference in the rates between money changers and banks is under 0.2%. Kubo et al. (2019) said a sample of exchange rates from nine banks and 11 money changers collected on September 12, 2018, found that the rates offered by the money changers varied from KHR 6–15, while those of banks ranged from KHR 12–35.

Transaction on the Cambodian foreign exchange market thus remains relatively small and are mostly in cash (IMF 2012, Kubo et al. 2019). Cash transactions are still popular even for companies and businesses. Kubo et al. (2019) said money changers are the main suppliers of cash for companies with a high proportion of cash payments. In Cambodia, the market for non-cash-based foreign exchange is not well-developed though the NBC tries to keep the retail and wholesale markets separate. Because the interbank market is also underdeveloped, the NBC must deal directly with money changers through auctions for KHR. In 2018, the central bank purchased USD 875 million from commercial banks and money changers (Figure 2-3). The volume of foreign exchange transactions with banks declined in 2018 from 2017 because banks could obtain KHR from the NBC through a variety of channels like the liquidity-providing collateralized operation (LPCO).

<Figure 2-4> Buying and Selling in Foreign Exchange Market (Million USD)



Source: National Bank of Cambodia

3. Challenges and Constraints of Cambodia's FX Policy: De-dollarization

Foreign exchange policy is one of the NBC's primary instruments to achieve price stability. Basically, the central bank intervenes in the foreign exchange market by buying and selling USD with licensed money changers and banks, allowing the government to absorb and inject KHR liquidity into the economy, balance the adjustment of real KHR supply and demand, and maintain a stable KHR-USD exchange rate. Over the last decade, the exchange rate has remained stable, with fluctuations remaining at under 3% because of the NBC's system of a "managed floating" exchange rate. But 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. The interbank market featuring foreign currency deals among banks remains underdeveloped. The domestic foreign exchange market is cash based and deals in small retail transactions (IMF 2012; Kubo et al. 2019). Basically, money changers are the main

suppliers of cash to businesses, with a higher proportion of cash payments out of their overall expenditures, leading to a currency mismatch (Kubo et al. 2019). Money changers deal more with cash-based transactions than banks and tend to offer competitive exchange rates.

Second, too many money changers hinder fiscal policy toward stimulating the use of the domestic 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. Thus, people have no incentive to hold their national currency because they can easily convert USD into KHR without having to wait or travel far. In most cases, civilians as well as tourists can make payments in USD. Furthermore, the stable nominal exchange rate allows them to carry more greenbacks without fear of exchange rate risk.

Third, the system of a managed floating exchange rate can apply pressure to foreign exchange reserves. In a highly dollarized economy like Cambodia, one argument says such reserves should be increased to guard against exchange rate volatility. As a source of such volatility, dollarization could hinder the development of the foreign exchange market (Yinusa 2008; Mengesha and Holmes 2013). Lay et al. (2012) empirically tested the relationship between dollarization and exchange rate volatility in Cambodia, and found that dollarization causes KHR depreciation as well as intensifies rate variability.

Fourth, the foreign exchange market is exposed to speculative attacks due to 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 predict moves on the market. Yet in a highly dollarized economy such as Cambodia, serious mismatches of currency and maturity do not occur, lowering the threat of speculative attacks. Cambodia's managed floating exchange rate has played a key role in building investor confidence in a risk-free rate. Clear evidence over the last 20 years shows how a stable KHP-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 USD, the adoption of a stable exchange rate is thus preferred as it poses no disadvantage to KHR users and could also stimulate the use of the domestic currency. Going forward, however, the prices of goods and services are increasingly being quoted in KHR under law and promoted by the NBC, thus a more volatile rate is preferred to disincentivize users of the greenback.

4. Overview of FX Market and Policy in Korea

A. Introduction

In Korea, the foreign exchange market consists of over-the-counter (OTC) markets and exchanges. The former feature foreign exchange banks that cater to clients such as importers, exporters, travelers and nonresidents, and an interbank market in which such banks deal with each other. The banks mainly participate in the interbank market to dispose of open positions arising from transactions with non-financial sector customers such as companies and nonresidents.

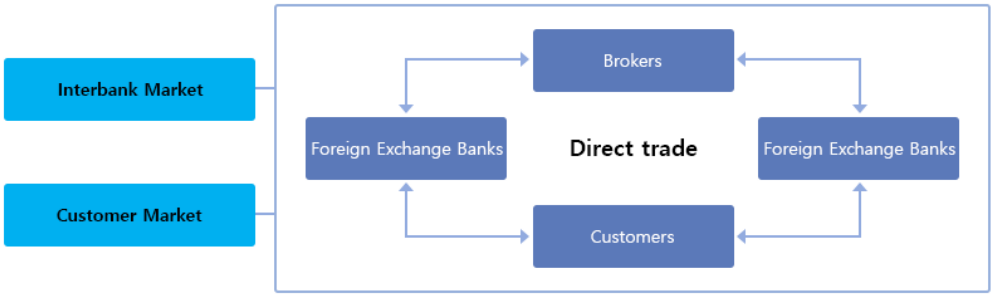
Most interbank transactions are conducted through brokers. Foreign exchange brokers play an intermediary role between foreign exchange banks without holding any positions. To run a foreign exchange brokerage, authorization is required from the Ministry of Strategy and Finance. Korea has 10 such brokerages.[9]

Financial institutions participating in the interbank foreign exchange market run the autonomous Seoul Foreign Exchange Market Committee. Foreign exchange brokers, the Bank of Korea, and the government also participate in the committee, which energetically seeks to develop the foreign exchange market through the active participation of the private sector.

9) Seoul Money Brokerage Services, Ltd.; Korea Money Broker Corporation; ICAP Foreign Exchange Brokerage, Ltd.; Tullett Prebon Money Brokerage (Korea), Ltd.; GFI Korea Money Brokerage, Ltd.; Nittan Capital Money Brokerage (Korea), Ltd.; Tradition Korea; BGC Capital Markets & Foreign Exchange Broker (Korea), Ltd.; KIDB Money Brokerage Corporation; IPS Corporation.

In December 2001, the committee drew up a Code of Conduct with the standards of major financial markets abroad as its benchmarks. It also set up two subcommittees, one for improving market practices and the other for market surveillance and dispute resolution (Seoul Code of Conduct).

<Figure 2-5 > Structure of Korean Foreign Exchange Market



Source: Bank of Korea website 2020

B. Foreign Exchange Rate System

Korea's foreign exchange policy emphasizes market principles in regulation according to the expansion of economic scale and external opening and quantitative and qualitative development of the financial and foreign exchange markets. In the 1990s, free capital movement and liberalization began in the country, and after the Asian economic crisis erupted in late 1997, the exchange rate system was changed to one using a freely floating rate. The goal of foreign exchange policy also emphasized market stability over an international surplus through measures such as alleviating rate volatility.

As capital movement between countries was further loosened, the impact of foreign capital inflows on the Korean economy increased. While the positive effects such as economic growth and development of the financial market due to capital liberalization increased, so did difficulties in macroeconomic management such as currency expansion, soaring asset prices, and heightened volatility in the exchange rate. Accordingly, the Bank of Korea (BOK) and the government strengthened regular monitoring of foreign capital

inflows. A new computer network for foreign exchange allowed close monitoring of detailed information on the flow of foreign capital, and a system to concentrate foreign exchange information in institutions let the BOK focus on and manage such data. Since the end of the 1997–98 Asian crisis, foreign exchange reserves have steadily increased to ensure external payments in emergencies. The reserves can help raise national confidence as well as stabilize exchange rates in the event of a private foreign exchange shortage.

After the 2008 global financial crisis, global recognition of the importance of macroeconomic stability spread thanks to its role in reducing systemic risk and promoting primary risk prevention efforts such as stabilizing macroeconomics and proper management of foreign exchange reserves. Accordingly, the discussion has been centered at international organizations, and Korea is striving to improve its macro-prudential policy through two measures to mitigate capital outflow fluctuations. In addition, strengthening international financial cooperation through measures such as the creation of a global financial safety net is increasingly important.

Not until February 1980 did Korea replace its fixed exchange rate system with one pegging the KRW to a basket of currencies, permitting the rate to fluctuate against major currencies. Under this system, the basic KRW-USD rate was calculated as the weighted average of two baskets: the SDR basket and a trade-weighted one comprising major trading currencies. An adjustment factor called the policy variable was also added:

$$\textbf{Exchange Rate} = \alpha \cdot \textbf{SDR basket} + \beta \cdot \textbf{TWB} + \textbf{P}$$

where $\alpha+\beta=1$, TWB: Trade weighted basket, P: policy variable.

In March 1990, the multiple-basket pegged system was replaced by the Market Average Exchange Rate System (MARS), in which the exchange rate was, in principle, determined by the interplay of foreign exchange supply and demand in the domestic market. Under this system, the interbank spot rate was allowed to move within an upper and a lower limit around each day's basic exchange rate. In December 1997, the daily fluctuation limits for the interbank exchange rate were abolished, making Korea's exchange rate a free-floating system (Table 2-2).

<Table 2-2> Change in Foreign Exchange Rate Bands

Effective dates	3.2 1990	9.2 1991	7.1 1992	10.1 1993	11.1 1994	12.1 1995	11.20 1997	12.16 1997
Band width (%)	± 0.4	± 0.6	± 0.8	± 1.0	± 1.5	± 2.25	± 10.0	± free

Source: Bank of Korea website 2020

Customer rates are decided independently by each foreign exchange bank and revised based on the movement of the interbank spot rate. The basic KRW-USD (market average) rate is determined as the transaction volume-weighted average of the rates applied to the previous business day's transactions between foreign exchange banks through brokers.

C. Prudential Regulation of Foreign Exchange Market

The foreign exchange position of a foreign exchange bank is the difference between its foreign currency assets and liabilities resulting from foreign currency trading. Limits are placed on the daily foreign exchange positions that such a bank may hold to encourage sound management through preventing exchange rate risk caused by heavy or overexposed positions and prevent disruption to the foreign exchange market as a result of abrupt shifts in the banks' foreign exchange positions.

Any overbought or oversold positions must be within 50% of capital as of the end of the previous month. A foreign exchange bank must maintain reserves worth a prescribed proportion of its foreign currency deposit liabilities in the form of foreign currency deposits with the central bank. The minimum ratios of reserves relative to resident foreign currency deposits are the same as those for domestic currency deposits, like 2% for time, installment savings, and certificates of deposit and 7% for demand deposits. The ratios of reserves relative to foreign currency deposits by nonresidents and other banks are both 1%.

<Table 2-3> Reserve Requirements for Foreign Currency Deposits

	Resident	Nonresident, Banks
Time deposit (maturity of over 1 month) Installment savings deposit (maturity of more than 30 days), certificates of deposit (maturity of more than 6 months)	2.0%	1.0%
Other deposits including demand	7.0%	1.0%

Source: Bank of Korea website 2020

Limits are placed on the daily positions of foreign exchange derivatives that a foreign exchange bank may hold. The intent is to contain an excessive increase in short-term foreign debt as companies conduct forward exchange transactions to hedge foreign exchange risk. The derivatives position of a bank must be within a specified level relative to its equity capital at the end of the previous month (40% for domestic banks and 200 percent for foreign bank branches).

Financial institutions must pay a foreign exchange stability tax of 0.1% on the balances of their non-deposit foreign currency liabilities with remaining maturities of under a year. The tax's purpose is to curb excessive foreign borrowings and encourage financial institutions to lengthen their foreign debt structures. The collected tax is used to provide foreign currency financing to financial institutions in times of crisis. The foreign currency liquidity coverage ratio (LCR) is a regulation to strengthen the resilience of foreign exchange banks against liquidity shocks and promote the building of liquidity buffers against short-term liquidity crises. A foreign exchange bank needs a sufficient amount of high-quality liquid assets that are easily convertible into cash to meet its liquidity needs over 30 calendar days to prepare for conditions of significant liquidity stress.

<Table 2-4> Foreign Currency Liquidity Coverage Ratio (LCR)

Target	Banks*
LCR	Stock of high-quality liquid assets/total net cash outflow over next 30 calendar days (cash outflows minus cash inflows)
Required ratio	40–60% (2017) → 50–70% (2018) → 60–80% (2019)

*Except 1) commercial banks with foreign exchange debts of under 5% of their total debt and USD 500 million or less in foreign exchange debt, 2) the Export-Import Bank of Korea, and 3) branches of foreign banks operating in Korea

5. Implications from Korea's Experience

A. Overview

As mentioned earlier, Cambodia has a highly dollarized economy and the domestic currency is used side by side with the greenback. Over 80% of Cambodian bank loans and deposits are made in USD, and the credibility of the banking system is solid. The Cambodian economy's heavy dependence on the USD, however, renders its monetary policy ineffective and reduces its monetary seigniorage. Accordingly, the government and its central bank continue to pursue policy to reduce the country's dependence on the USD. Dollarization has positive effects such as price stability and the boosting of confidence of international investors, but its side effects include limited effectiveness of monetary policy and the reduction of possible securities.

Cambodian policymakers are seeking to lower dollarization through mandatory use of a select percentage of KHR credit and fostering the domestic currency in the financial market, but this will be hard. The NBC has adopted a limited foreign exchange policy by operating a managed floating rate system. Over the past 10 years, the KHR-USD exchange rate has remained stable, reaching a record low 3,984.0 in February 2014 and a record high of 4235.0 in August 2010.[10]

10) https://data.imf.org/regular.aspx?key=61545862

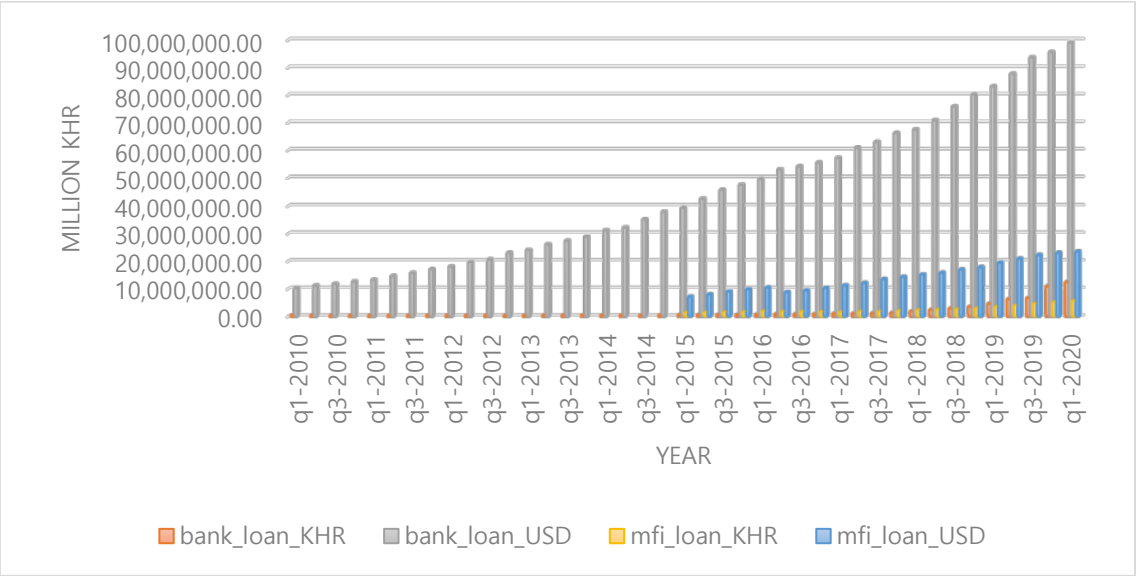
B. Analysis of Financial Dollarization

Given the Cambodian economy's fast growth rate, global factors promoting de-dollarization such as low global interest rates, low risk aversion by investors (low VIX), and high raw material prices as specified in the next subsection[11] are generally considered favorable for de-dollarization policy. Over the past five years, the economy's growth exceeded 7%, the highest in Southeast Asia. Among global factors for de-dollarization mentioned above, low international interest rates and low-risk aversion by investors are favorable, but fears over a global economic slowdown have lowered raw material prices. Yet analysis and evaluation are necessary regarding how foreign investment attraction and price stability, two effects of dollarization, contribute to the high growth rate.

By contrast, the weakness is that demand for credit and domestic loans, especially those denominated in KHR, remains insufficient partly due to high foreign direct investment (<Figure 2-6>). <Figure 2-6> presents the size of bank and MFI loans both in USD and KHR. Nevertheless, <Figure 2-7> presents real GDP, the size of loans from both banks and MFIs, and loans to real GDP ratios. Over the past two or three years, KHR-denominated loans have risen at a faster rate than real GDP growth. This suggests that the NBC's strategies to promote the domestic currency are quite effective, thus providing favorable conditions to implement de-dollarization policy.

11) Section C has a detailed explanation on global factors for promoting de-dollarization.

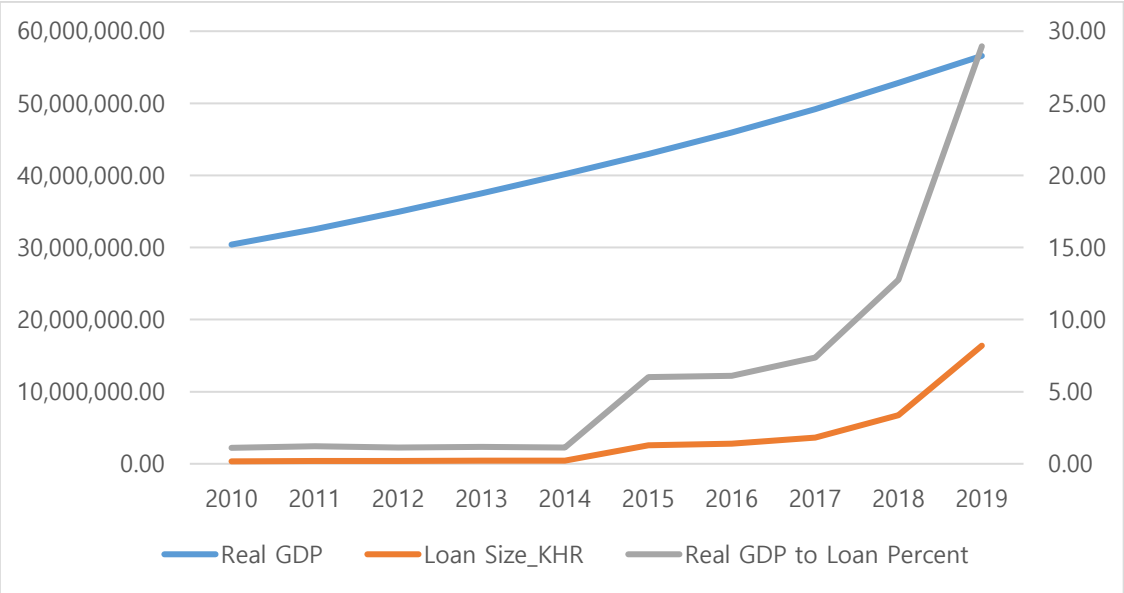
<Figure 2-6> Sizes of Loans from Banks and MFIs (USD and KHR)



Note: Author's presentation based on NBC data

<Figure 2-7> Real GDP, Loan Size in KHR, Loans to Real GDP Ratios

(Unit: LHS – Million KHR, RHS - %)



Note: Author's calculation based on NBC data

This subsection features a simple regression analysis on how financial dollarization in Cambodia is affected by domestic and global factors using Cambodian data. Following

Catão and Terrones (2016), deposit dollarization[12] is employed to measure financial dollarization. The usual first step is to test the presence of unit roots in deposit dollarization ratios and not reject it as frequently noted by prior studies. This implies the "dollarization persistence phenomenon" mentioned by Catão and Terrones (2016).

Furthermore, the lack of robust evidence of co-integration between deposit dollarization and its potential explanatory variables leads to estimating regression in first differences. The dependent variable is the quarterly change in the deposit dollarization ratio and explanatory variables are domestic factors such as forecasts of real GDP growth one year ahead, differences in real exchange rates, foreign direct investment (FDI), deposit/loan interest rates and global factors, VIX, three-month Libor rate for USD, and the real metal index to affect deposit dollarization.

According to the regression results shown in <Table 2-5>, global factors such as international interest rate matters and VIX affect financial dollarization in deposits[12] more than the domestic factors specified in the analysis. Variables in real GDP growth forecasts matter to an extent but the sample is missing many variables.[13]

12) Since VIX is significantly associated with financial de-dollarization in just one analysis (1), the result is not as robust as the Libor rate.

13) For the analysis with the deposit/loan interest rate variable, the number of samples for the variable was only 30, so it was excluded from the study.

<Table 2-5> Regression Analysis of Deposit Dollarization in Cambodia

	(1)	(2)	(3)	(4)	(5)
Required marginal reserve in FX (difference)	.0064 (0.10)	.0615 (1.05)	.041 (0.70)	.05327 (-1.03)	.01884 (0.39)
Real GDP growth (1-year forecast)	-.045 (-0.80)	**-.0994*** **(-1.77)**	**-.1093*** **(-1.89)**		
Real FX rate (logs, lagged difference)	-.0206 (-0.00)	3.245 (0.74)	1.483 (0.34)	-4.806 (-1.29)	-1.4867 (-0.39)
VIX (logs avg. difference)	**.430*** **(1.96)**	.3432 (1.54)	.2060 (0.75)	-.0547 (-0.25)	-.1135 (-0.51)
Metal P (logs real, difference)	.9687 (1.66)	0.8580 (1.34)		**1.0556*** **(1.84)**	
Libor rate (USD 3-month avg. difference)	.2856 (1.58)	**.4506***** **(3.98)**	**.4675***** **(4.00)**	**.42166**** **(2.52)**	**.36015**** **(2.69)**
FDI (logs, diff)		-.3513 (-0.88)	-.3687 (-0.82)		-.0777 (-0.14)
Obs.	48	40	40	73	49
Adj. R-squared	0.65	0.79	0.77	0.47	0.69

C. Implications for Cambodia's Foreign Exchange Policy

Suggesting the setting of market-oriented foreign exchange rates and building an appropriate system seeks to improve foreign exchange policy in line with gradual progress in de-dollarization. Under the assumption that Cambodia plans to gradually implement a de-dollarization policy, examination of prior case studies is necessary to decide which foreign exchange policy to execute. From the early 2000s to just before the 2008 global financial crisis, the trend of de-dollarization spread worldwide but its appeal mostly contracted or disappeared after the crisis such as in Turkey, Argentina and Russia (Catão and Terrones 2016). Peru was considered to have successfully promoted a de-dollarization policy. Domestic macro-prudential measures in Peru raised the relative cost of USD-denominated loans and its introduction of and compliance with inflation targeting were deemed effective. And aside from domestic variables affecting de-dollarization, low global interest rates, low risk aversion by investors (low VIX), and high prices of raw material prices[14] were other factors.

A dollarized financial system inherently carries significant risk including the potential for large mismatches between the share of dollar-denominated liabilities and that of dollar-denominated assets.[15] This leads not only to a possible run on dollar deposits not fully backed due to a fractional reserve banking system, but also causes larger income losses to banks when exchange rates fluctuate. These risks can trigger generalized bank runs under uncommon preconditions (Rajan and Tokatlidis 2005).[16]

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14) Low international interest rates: Generally, lowering the cost of external financing in USD promotes foreign borrowing in the greenback, and this tends to replace USD-denominated deposits. Low investor aversion to risk: The classic effect of increasing the risk aversion of global investors is to make them focus on a safe currency, and the greenback is generally considered the safest. High commodity prices: These contribute to de-dollarization by raising the value of the domestic currency.

15) The Cambodian economy is highly dollarized, but serious mismatches between currency and maturity do not occur, according to the NBC. The net open position of foreign exchange is 5 percent of the banking sector's combined assets.

16) Rajan and Tokatlidis (2005) argued that a strong correlation exists among the suspension of capital flows to a country, the extent of dollarization of the country's banking system, and the prevalence of banking crises. In particular, when the domestic currency is significantly devalued, the degree of USD-

In dollarized economies such as Cambodia, the choice of exchange rate systems includes the same general considerations as non-dollarized economies, but the prevalence of currency substitution (using dollar-denominated assets in transactions) tends to strengthen the fixed exchange rate system (IMF 1999).[17] Most countries with a high level of dollarization adopt a fixed exchange rate system (Rajan and Tokatlidis 2005). Cambodia uses a managed floating rate system, but this can be considered as a practical fixed rate system that determines and announces exchange rates through daily NBC-related meetings. Such negotiations protect the economy from the effects of potentially excessive movements in exchange rates and fluctuations in the money market, and can be an effective means if extreme inflation occurs. Yet these implications do not apply when dollarization leads to asset substitution (holding USD-based assets as a means of value storage), as in the Cambodian case.

Over the long term, the Cambodian government and its central bank will continue promoting the KHR and macro-prudential policy,[18] while reviewing the need to introduce and gradually implement inflation targeting with a floating rate system. Accompanying macro-prudential policy actions necessary by lowering the degree of dollarization include an upper limit on the ratio of loans to collateral value, adjustment of required capital, and expansion of supply for USD investment.

Inflation targeting by the central bank strengthens the means of storing the KHP's value as a reliable system that ensures stable and low inflation. A major potential shortcoming of inflation targeting in a dollarized economy, however, is the risk of financial instability due to exchange rate fluctuations if targeting rates is abandoned

based loans determines the degree to which the financial system is exposed to systemic credit risk. This is because such loans simply transfer currency risk to non-USD-producing borrowers by putting greater (exchange-related) credit risk on the bank.

17) The theoretical literature suggests that a key implication of currency substitution is that the volatility of a floating exchange rate tends to be greater (IMF 1999).

18) If the NBC fails to actively push for a policy to promote KHR, the value of storage of KHR as the domestic currency could fall. The experience of Peru illustrates that de-dollarization is achieved through macro-prudential regulations—especially through higher loan provisioning and high capital requirements on USD-based loans—and the introduction of inflation targeting.

(Calvo and Reinhart 2002). Exchange rate volatility under inflation targeting is not always higher than that under non-inflation targeting (Edwards 2006). Floating exchange rates are well suited for small and open economies and those with a high level of dollarization (Ize and Yeyati 2005; Palacios-Salguero 2008).[19]This is consistent with the trilemma of exchange rate theory, which means only two of three goals can be chosen at the same time: free capital movement, monetary policy autonomy, and a fixed exchange rate. Thus if Cambodia chooses independent monetary policy and free capital movement, this suggests the abandonment of a fixed exchange rate.

Though the NBC's foreign exchange system was finally changed to one using a floating rate, development of a market-oriented exchange system is being considered depending on the degree of de-dollarization in a transitional period. As adopted by Korea in the 1980s, an exchange rate system suitable for Cambodia's economic and financial environment should be adopted and advanced by including policy consideration in the average of exchange rates linked to multiple baskets. Cambodia has no effective wholesale foreign exchange market that is not cash based. Developing such a market is thus an urgent task. For the sake of efficiency, banks and MFIs should handle non-cash foreign exchange transactions and develop the wholesale foreign exchange market, and money changers can mostly focus on cash exchange transactions. Obviously, these should be accompanied by the creation and fostering of an interbank market. Another recommendation is to benchmark the Korean experience in developing a market-oriented foreign exchange policy, such as the formation of the Foreign Exchange Steering Committee of the Korea Federation of Banks.

To lower its high degree of dollarization, Cambodia could promote the use of KHR in

19) Since "predicted dollarization" increases with inflation volatility and decreases with the volatility of depreciation of the real exchange rate, stable inflation and a fluctuating real exchange rate should be associated with low dollarization (Ize and Yeyati 2005). The combination of inflation targeting (to the extent that it reduces inflation volatility) with a floating exchange rate (to the extent that it increases real exchange rate volatility) should foster the use of the domestic currency and discourage that of the foreign currency. Palacious-Salguero (2008) said the most important finding in their study was that a flexible exchange rate system is the best policy for providing a greater level of (conditional) welfare to the domestic economy than from the fixed exchange rate regime, a result consistent with conventional wisdom.

real and financial transactions[20]. First, for real transactions, Cambodian fiscal authorities can initiate economic development projects using KHR for payments. Another option is to improve the payment system (e.g. credit cards) based on KHR. Second, incentives are needed to encourage deposits in the domestic currency while discouraging USD-denominated deposits by widening the differences in interest rates between deposits in KHR and those in USD or providing tax breaks for interest income in KHR. Third, disincentives for converting USD into KHR are needed by gradually replacing money changers with banks and MFIs. Imposing transaction costs on currency conversion to widen buy and sell differentials can discourage the reception of USD in transactions.

As mentioned earlier, Cambodia needs a macro-prudential policy that suits its economy. For example, a macro-prudential stability levy on USD-denominated deposits and loans can be adopted depending on economic and financial conditions. Korea imposed such a levy on marketable receipts (short-term foreign currency borrowings), which are considered to have high systemic risk, after the 2007-2008 global financial crisis. The main objective is lengthening the maturity structure of foreign currency borrowing, which turned out to be particularly effective in reducing short-term FX liabilities for foreign bank branches (Ahn et al., 2019). Other potential capital controls that Cambodia considers to adopt is capital control for exports (and/or imports) (Ahn 2016). For a small open economy, export receipts can be a non-negligible source of foreign currencies (and money supply), thus being important to keep track of them. It requires the use of Letters-of-Credit for export (and/or import) transactions. It was only in 1992 that capital control for export receipts was gradually relaxed in Korea, and that for imports payments was gradually relaxed in 1998. Since 1999, foreign exchange was completely liberalized.[21] Concluding currency swaps between the NBC and the central banks of other countries with high currency reliability among those active in trading, including Korea's, can improve the credibility of the Cambodian currency.

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20) Anonymous referees' helpful comments for this section were highly appreciated.

21) Prof. JaeBin Ahn's helpful comments at the final seminar are highly appreciated.

<Table 2-6> presents a roadmap for suggested de-dollarization and a foreign exchange policy in Cambodia by stage, and presents the essential conditions of internal and external factors.

<Table 2-6> De-dollarization via Foreign Exchange Policy based on Changes in Major Domestic and Global Factors

	Domestic factors				Global factors	
Hori-zon/factors	Macro-prudential policy	Inflation-targeting (free-floating FX system)	High demand for credit in KHR	Other policies	Low global interest rate	Low risk aversion by investors
Current	10% required loans in KHR (1)	Managed floating rate (close to fixed)	Low demand		USD 3-month Libor rate*: 1.529	VIX about 30 (still uncertain)
ST & MT	More macro-prudential policies (2~3)	Managed floating (multi-basket)	Medium demand		Similar to current rate	VIX lower than 20
LT	More macro-prudential policies (more than 3)	Free floating	High demand		Similar to current rate	VIX lower than 20

Notes: The macro-prudential policy includes an upper limit on the ratio of loans to collateral value, adjustment of required capital, and expansion of supply for USD investment. VIX values of greater than 30 are generally linked to large volatility resulting from increased uncertainty, risk and investor fear. VIX values under 20 generally correspond to stable and stress-free periods in markets (Investopedia 2020, https://www.investopedia.com/terms/v/vix.asp).

* Q1 2020 USD 3-month Libor rate: 1.529% (FRED).

III. How to Set Policy Rate for Effective Monetary Policy in Cambodia

Cambodia's financial system and economy are advancing at a rapid pace, so the country needs policy rate setting that can steer the economy toward sustainable growth. This process is never easy for the National Bank of Cambodia (NBC), however, as the country's dollarization has undermined the central bank's effort in implementing monetary policy. Therefore, the NBC must create a framework in which it can influence the market rate for KHR and to an extent USD. Based on the Bank of Korea's experiences with interest rate-oriented monetary policy, we can make proposals for feasible operations of interest rate-based monetary policy in Cambodia such as setting the policy rate and open market operations (OMO).

1. Monetary Policy Framework of National Bank of Cambodia

Monetary policy in Cambodia is formulated and implemented by the National Bank of Cambodia (NBC). The NBC's mandate under the Law on the Organization and Conduct of the National Bank of Cambodia is to "determine and direct the monetary policy aimed at maintaining price stability to facilitate economic development within the framework of Cambodia's economic and financial policy."

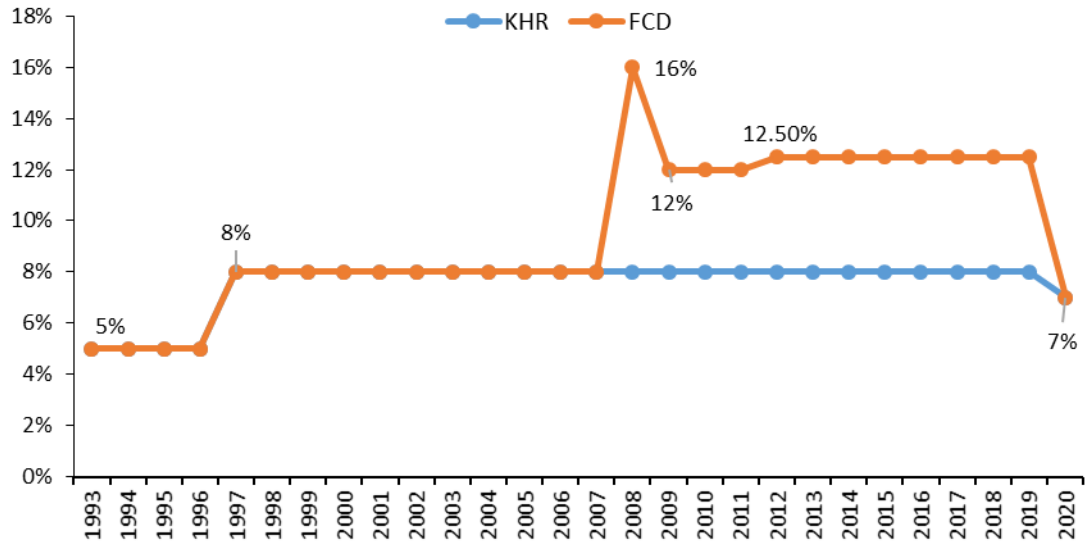
Under the main objective of maintaining price stability, the NBC has three main policy tools: the reserve requirement rate, foreign exchange intervention, and OMO (through instruments such as overdraft, negotiable certificates of deposit, liquidity-providing collateralized operations and marginal lending facilities).

A. Reserve Requirement

The NBC uses the reserve requirement as both a macroprudential and monetary policy tool. It requires banks and microfinance institutions (MFIs) that accept deposits to keep a portion of their customers' deposits and borrowings at the NBC. From 1993 to 1998, the

NBC set the required reserve ratio (RRR) at only 5% but later raised it to 8% to enhance confidence in the banking system and safeguard against risks during the Asian financial crisis. In 2008, the RRR on foreign currency deposits was doubled from 8% to 16 % in the wake of the global financial crisis, while the RRR for KHR remained at 8%. The increase in foreign currency RRR did not interrupt bank lending because banks held substantial excess reserves.

<Figure 3-1> Reserve Requirement Rate (1993–2020)



Source: National Bank of Cambodia

Amid the fears over the global financial crisis in 2008, the NBC raised the RRR as a prudential measure for foreign currency deposits and borrowings; the rate went up to 16%, of which 8% bore three-fourths of the one-month SIBOR. In 2009, the foreign currency RRR was cut to 12% before inching back up to 12.5% in 2012. The NBC maintained a relatively low RRR on KHR deposits from 1998 to promote lending in the Cambodian currency. For reserve requirements on foreign currency deposits, 8% will bear no interest, while the remaining 4.5% will bear interest at half of the one-month SIBOR. In September 2018, however, renumeration of the 4.5-percent portion of the RRR was suspended and the reserve requirements for both KHR and foreign currencies bore no interest.

B. Open Market Operations

The main instruments of open market operations (OMO) are overdraft, negotiable certificate of deposit (NCD), liquidity-providing collateralized operation (LPCO), and marginal lending facility (MLF).

Overdraft

This is available to all NBC counterparties, but structurally used for clearing purposes, with NCDs used as collateral against use. The facility provides overnight funds at 6% for KHR and 8% for USD-denominated borrowings. The MLF is primarily used by banks for clearing purposes but can also be accessed for short-term liquidity shortages. The facility used to be for emergency lending, but with the introduction of emergency lending assistance, it is also for regular liquidity needs.

The availability of a short-term lending facility is a welcome step, and as the central bank seeks to mop up high levels of excess reserves, the availability of the MLF will help achieve that goal. As the NBC seeks to lower the amount of excess reserves in the system, banks urgently require access to short-term liquidity smoothing facilities to better manage their reserves. The acceptance of NCDs as collateral by this facility is an important step, with the benefit of supporting NCD demand.

The interest rate charged for overdraft use should be lowered to reflect both the short-term nature (overnight) of the borrowing and the zero-collateral risk (NCDs). Charging a more measured rate of interest for this facility is in line with the objective of lowering the high level of excess reserves, as banks would not hold such excess if they could borrow from the NBC at a sensible rate. This would also serve as a benchmark interest rate for short-term collateralized borrowing on the market.

Negotiable Certificate of Deposit (NCD)

The negotiable certificate of deposit (NCD) was introduced on September 9, 2013, to foster the development of the interbank market and give banks the means to manage their

liquidity. The certificate is also a tool for the central bank to absorb excess liquidity in the banking system and reallocate financial resources among financial institutions, as well as serving as collateral for facilities provided by the central bank such as the LPCO and MLF. Financial institutions can use their excess reserves to buy NCDs with varying maturities ranging from two weeks to a year.

An NCD is a short-term, interest-bearing debt instrument issued by the NBC in both KHR and USD to help commercial banks and microfinance institutions (MFIs) invest their excess liquidity over the short term. The minimum denomination for an NCD is KHR 200 million or USD 50,000. The maturity of a KHR-based NCD ranges from two weeks to a year, whereas that of a USD-denominated NCD ranges from two weeks to six months. A one-year NCD was issued to provide banks with longer maturity security to invest and facilitate the collateralization of the liquidity-providing collateralized operation (LPCO) extended to one year. NCDs cannot be returned to the NBC before maturity, but can be transferred to a third party who must enter Repo Master Agreement witnessed by the NBC.

The interest rates of NCDs are primarily determined by the NBC based on the length of maturity. The rates fluctuate daily according to market conditions and are quoted every working day on the NBC website (www.nbc.org.kh). The interest amount is calculated based on the number of days of each year (365 or 366). Initially, the interest rate for a USD-based NCD was half SIBOR whereas those for KHR-based NCDs were:[22]

Maturity	2 weeks	1 month	2 months	3 months	6 months	9 months	1 year
Interest	0.85%	0.90%	0.95%	1.00%	1.20%	1.55%	2.00%

An NCD with longer maturity receives a higher interest rate relative to that with shorter maturity. Data in 2017 and 2018 found that interest rates for KHR-denominated NCDs of all maturities varied from 0.69 to 3%, while those for USD-denominated NCDs of all

22) On January 8, 2014, the NBC announced that it would use LIBOR instead of SIBOR.

maturities remained relatively stable at 0.24–1.31%. Higher interest for KHR-denominated NCDs could suggest that the associated risk or cost of holding such securities is higher than that of holding USD-denominated ones.

<Table 3-1> shows that the interest rate for KHR-denominated NCDs is twice that of USD-denominated NCDs for all maturities. Though both NCD types bear relatively higher interest rates for the maturities of 6 (182 days) and 12 months (364 days), shares of their annual sales in total annual-issued value were much smaller at 0.1% and 0.8% respectively for KHR-based NCDs and 1.8% and 0.5% respectively for USD-NCDs in 2018. NCDs in KHR with maturity of one, two, and four weeks contributed to approximately 90% of the total value of NCDs issued in 2018, while KHR-denominated NCDs with three-month maturity comprised about 8% in the same year. Meanwhile, NCDs denominated in USD with one-month maturity accounted for half of the total value of NCDs issued in 2018, while those based in USD with maturity of one or two weeks or three months took up around 48%.

<Table 3-1> Avg. Interest Rates for NCDs by Maturity in 2018

Maturity (days)	KHR-based NCDS (1)	USD-based NCDs (2)	Spread (1)-(2)
7	0.53	0.27	0.26
14	0.55	0.29	0.26
28	0.80	0.34	0.46
91	1.02	0.77	0.25
182	2.96	0.89	2.07
364	2.25	1.08	1.17
	Annual weekly average (Mn KHR)	**Annual weekly average (Mn USD)**	
7	60,192	51	
14	60,234	102	
28	84,248	434	
91	17,657	62	
182	138	8	
364	1,857	2	

Source: National Bank of Cambodia (2019)

Advantages of NCD

- **No credit risk:** Because NCDs are issued by the NBC (supported by Prakas B-5-010-183 on the Issuance of Tradable Securities), the investment has no credit risk.
- **Interest earned:** An NCD is an interest-bearing instrument so banks who invest their excess reserves in NCDs will earn interest. The interest is paid on the maturity date to the account of the NCD's owner at the NBC. The interest rate for NCDs is comparably higher than that of term deposits, and is calculated as follows:

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

where: "P" is the principal amount, "r" is the annual interest rate expressed as a percentage divided by the number of days in a year, and "t" is the NCD's tenor.

- **Highly liquid:** NCD is a short-term instrument, risk free, and issued by the central bank, thus it can be traded in a highly liquid secondary market.
- **Repurchasable by NBC:** In the interim, the NBC can repurchase an NCD at a discount if the NCD's owner faces difficulty finding a counterpart. The repurchase formula for buying back an NCD is:

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

- **Transferrable:** The NCD's owner can transfer it to any party at any time in the interbank market. The NBC will transfer ownership once it receives notification from the buyer and seller.
- **Use as collateral:** NCDs can be used as collateral for a credit facility from the NBC and on the interbank market such as the liquidity-providing collateralized operation (LPCO).

Disadvantages of NCDs

Despite its many benefits, an NCD incurs the following risks:

- Maturity is determined by the NBC, and thus investors might be unable to invest funds with a maturity as desired.
- The NBC sets the interest rate that is fixed for the NCD's entire term, thus investors cannot get a higher interest rate if that of the market rises.
- Any request to sell an NCD back to the NBC is subject to the latter's discretion. The central bank encourages investors to sell NCDs on the interbank market.
- The buyback price for an NCD is subject to the holding period and the NBC's

discount rate.

- At the time of investment, an investor could face interest rate risk due to market volatility.

Subsequent Improvements to NCD

Since the NCD's launch, the NBC has conducted several policy revisions to make the instrument more attractive on the interbank market. These measures are classified by their date of implementation below:

- October 16, 2014

- Made fixed deposits in banks and financial institutions with the NBC less attractive by freezing interest rates and penalizing early redemption (forfeit of interest and penalty of KHR 500,000 or USD 125 per certificate)

- Raised the interest rate on an NCD by 50 basis points from ½ to ¾ of LIBOR, which would then be higher than that of a fixed deposit

- Agreed to buy back an NCD before maturity at a competitive price subject to NBC conditions

- Opened an online trading platform on the NBC website so that NCD holders can view NCD characteristics and prices

In addition, the minimum certificate amount of USD 500,000 is understood to preclude the participation of smaller banks.

- **October2015:**

– Reduced the face value of a KHR-based NCD from KHR 2 billion to KHR 200 million and that of a USD-denominated NCD from USD 500,000 to USD 50,000

– Terminated fixed deposit formerly provided to banks and MFIs by the NBC and provided only NCDs instead

- **October 5, 2016:**

– Launched weekly issuance of NCDs with selling scheduled every Wednesday, a move aimed at developing the interbank lending market by promoting a secondary market for short-term interest-bearing certificates

- **June 18, 2017:**

– Shortened maturity of both KHR- and USD-based NCDs on a weekly basis to 7, 14, 28, 91, 192, or 364 days; this enabled better matching with the issuance dates of LPCOs

- **August 11, 2017:**

– Launched the National Bank of Cambodia Platform (NBCP), an online trading platform for NCDs

- **November 8, 2017:**

– Lowered interest rate 50 basis points for both KHR- and USD-denominated NCDs

– Set the difference between buying and selling interest rates (both types of NCDs) at 25 basis points

- **March 9, 2020:**

– Set difference of 15 basis points between buying and selling interest rates for NCDs (both types)

– Took the benchmark rate of 1/5 LIBOR for USD-denominated NCDs with

maturity of 7, 14, or 28 days; 1/3 LIBOR for USD-denominated NCDs with 91-day maturity; and 1/2 LIBOR for USD-denominated NCDs with maturity of 182 or 364 days

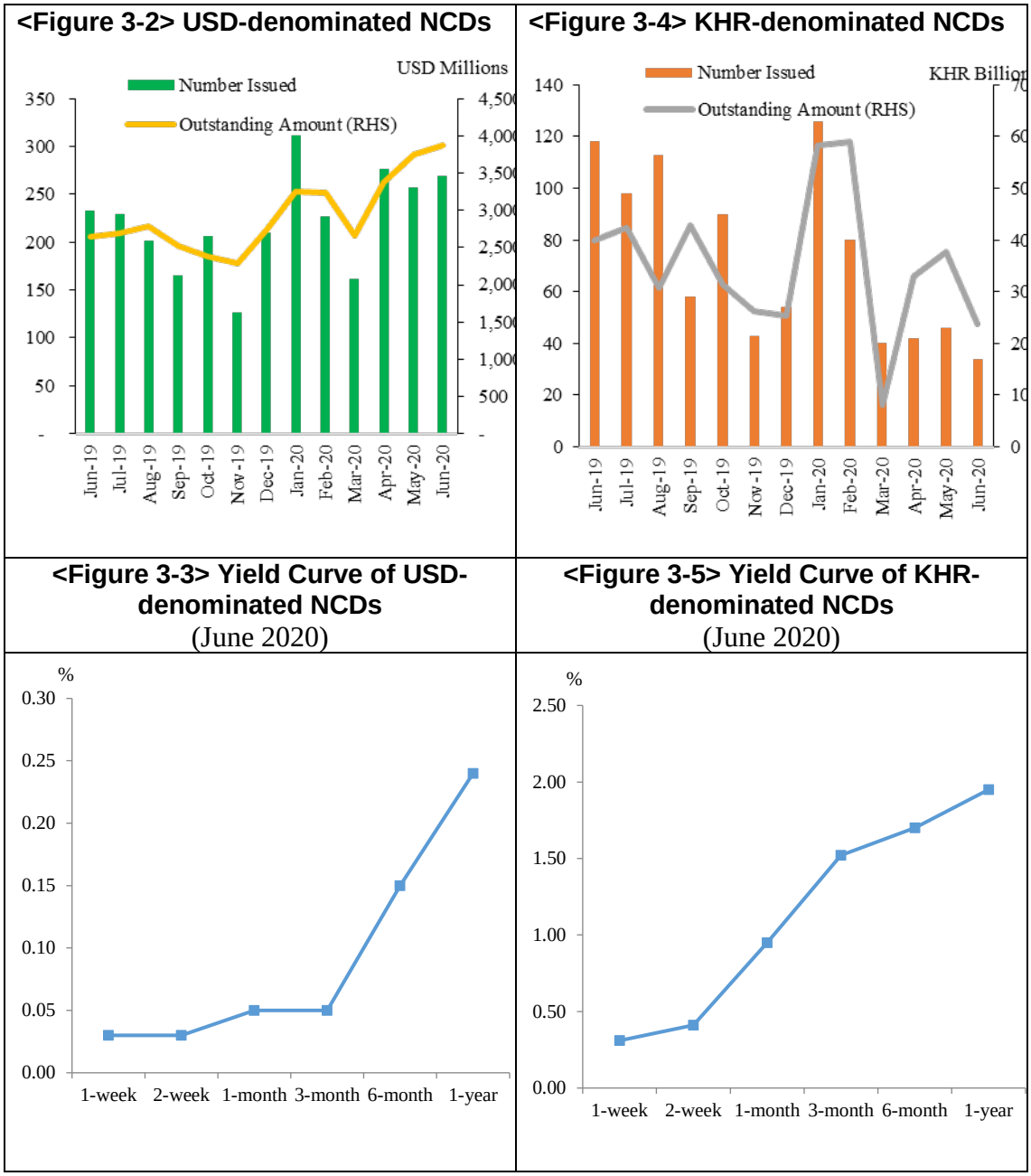
– Enabled the interest rate for KHR-denominated NCD to change in accordance with LIBOR and types of NCD maturity (see <Table 3-1> for details)

<Table 3-2> Interest Rates for NCDs (June 2020)

USD-based NCDs			
Tenor	Buying	Selling	
			Adjustment (required by top mgmt.)
1W	=Selling+0.15	1/4*Libor	-
2W		1/4*Libor	-
1M		1/4*Libor	-
3M		1/3*Libor	-0.05
6M		1/2*Libor	-0.05
12M		1/2*Libor	-0.05

KHR-based NCDs				
Tenor	KHR base rate (<LPCO rate)	Buying	Selling	
				Adjustment (required by top mgmt.)
1W	0.40	= Selling + 0.15	Change of Libor(T0&T1) + base rate	-
2W	0.50			-
1M	1.00			-
3M	1.60			-0.05
6M	1.80			-0.05
12M	2.00			-0.05

*** Difference in buying and selling is 15 basis points
Source: NBC



Source: National Bank of Cambodia

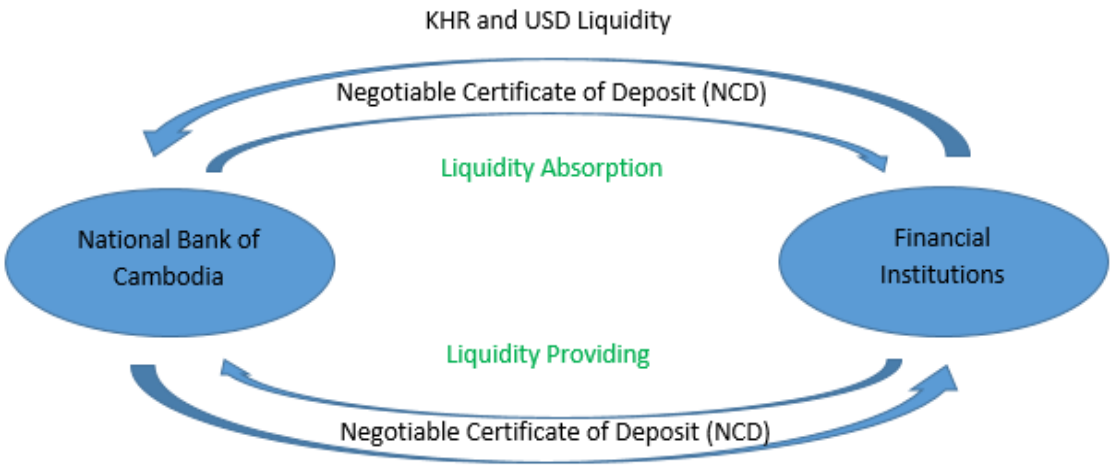
Liquidity-providing Collateralized Operation (LPCO)

The interbank market in Cambodia remains in the early stage of development with a low transaction volume. For that reason, many banks and microfinance institutions (MFIs) continue to buy and hold NCDs until maturity, whereas other financial entities lack

liquidity in KHR. This experience shows that the issuance of NCDs absorbs both USD and KHR liquidity from banks and MFIs. In order to enhance liquidity management by both banks and MFIs, help develop the interbank market, and promote the use of KHR, the NBC conducted its first LPCO on October 18, 2016 after the official announcement of the operation's launch on September 23, 2016. The LPCO was also introduced in response to liquidity demand in KHR by MFIs to help finance the agricultural sector, which was suffering from the El Nino effect.

The LPCO is an auction process that allows banks and MFIs to bid for a KHR liquidity amount within a large package set by the NBC for a three-month maturity and with the possibility of rollover at maturity with NBC approval. To join this operation, banks and MFIs must pledge NCDs as collateral with the NBC after winning bids.

<Figure 3-6> Liquidity-providing Collateralized Operation (LPCO)



The LPCO has the following functions:

- Create a benchmark rate for the interbank market and implementation of monetary policy
- Raise demand for NCDs as a guarantee tool for the interbank market
- Promote the use of KHR by providing liquidity in the domestic currency, which allows banks and MFIs to provide 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 in lending[23]
- Support the agricultural sector since it needs more funds to buy crops. A joint survey by JICA and the NBC found that KHR is mostly used in agriculture, so providing liquidity in the domestic currency will support financing in the sector.
- Contribute to lowering high interest rates

The Cambodian banking system has excess KHR liquidity, most of which is held by a few large banks. Thus, small financial institutions for years have had difficulty in accessing KHR liquidity and bear the high cost of KHR funding because of an inactive interbank market. Many microfinance deposit-taking institutions (MDIs) and microfinance institutions (MFIs) have experienced such a shortage in making KHR-denominated loans to the agricultural sector since most of their funds are in USD. The high cost of KHR funding for small financial institutions such as MFIs force such entities to charge high interest rates to rural borrowers.

To resolve this issue, the LPCO plays an important role in strengthening monetary policy through the injection of KHR liquidity into the financial system. Before launching this instrument, financial institutions needing KHR funds had to sign an agreement to obtain funding from other domestic financial institutions and international partners. Funding from these two sources, however, was limited and expensive. The LPCO is now a liquidity source for banks and MFIs to meet the ever-increasing demand for KHR, especially in agriculture, and has helped reduce the cost of KHR funding.

The LPCO has also helped narrow the lending rate spread between KHR and USD. The relative lack of funding sources in KHR is the primary reason for KHR-denominated loans having higher interest rates than those of USD-based loans. Thus an increase in

23) The NBC has introduced a Prakas (rule) that requires banking institutions to have at least 10% of their loan portfolios denominated in KHR.

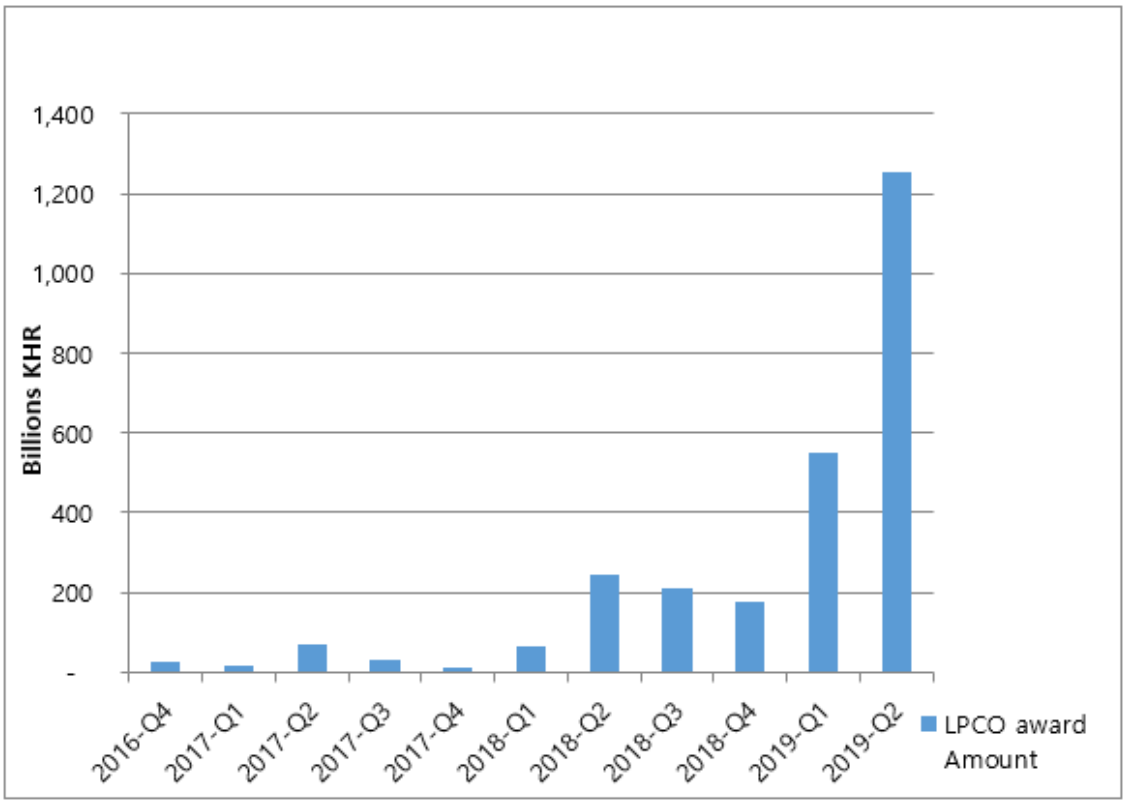
sources of KHR funds since the LPCO's introduction in late 2016 has contributed to narrowing the interest rate gap between KHR- and USD-denominated loans.

Furthermore, the LPCO has promoted the use of NCDs as securities that serve as collateral for repurchase (RP) transactions. The LPCO is considered an RP transaction because at maturity, financial institutions need to buy back the NCDs that they pledged as collateral. The LPCO is conducted through a Dutch auction once a month and its maturity must match that of the NCDs.

The placement of USD-denominated NCDs as collateral for an LPCO is subject to a haircut, or the difference between an asset's market value and the value assigned to that asset to calculate regulatory capital or loan collateral. An appropriate haircut is applied to USD-denominated NCDs to mitigate the foreign exchange risk. The LPCO was launched in 2016 with a tenor of three months and a haircut of 10%. In 2017, that tenor was raised from 3 months to 12. In March 2018, LPCOs with tenors of six and three months were introduced in addition to the year-long one, and the interest rate of a haircut was cut to 5% and further to 3% in late 2018.

Given market demand for liquidity in KHR, the NBC in 2019 increased the allotment amount to KHR 400 billion per auction and allowed two auctions per month. Banks and financial institutions were also allowed to roll over maturity by applying the last LPCO result. Cambodia now has 25 financial institutions taking part in in LPCO transactions—21 commercial banks and four microfinance deposit takers. Commercial and specialized banks and MDIs can join if they sign Master Agreement with the NBC, apply to use the central bank's platform NBCP, and set aside cash reserves for buying NCDs after auction days.

<Figure 3-7> Awarded Amount for LPCO



Source: National Bank of Cambodia (2019)

The interest rate of the LPCO seldom changes. The minimum rate for three-month maturity is 2.6%, 2.85% for six months, and 3.5% for 12 months. Figure 3-12 shows the LPCO bidding amount was slightly raised to meet market demand, displaying amounts from October 2016 until June 2019 by quarter. And a notable jump in the awarded amount at the bi-monthly LPCO auction occurred in the second quarter of 2019.

Marginal Lending Facility (MLF)

Banking and financial institutions in Cambodia frequently face liquidity shortages in the money and interbank markets. To tackle these problems, the NBC introduced the marginal lending facility (MLF) in 2019, a short-term liquidity instrument with an interest rate predetermined by the central bank and obtainable in exchange for collateral meeting the required criteria. Apart from dealing with liquidity shortages in the banking system,

the MLF also helps maintain short-term stability in interest rates on the interbank market and determines the interest rate corridor at a level deemed appropriate for economic fundamentals by the central bank. The facility's interest rate is considered a ceiling for short-term rates on the interbank market to prevent rates from overshooting. In doing so, banking and financial institutions avoid seeking liquidity from the interbank market if the interest rates on that credit are higher than those offered by the central bank.

The MLF is a standing facility offered by the NBC that counterparties may use to receive overnight credit in KHR at a pre-specified interest rate; it is subject to a requirement of having sufficient eligible assets as collateral. The roles of the MLF are as follows:

- Provide short-term liquidity in KHR to banks and financial institutions in need, with maturity of up to one week
- Help secure liquidity in KHR to banks and financial institutions unable to get it through LPCO because they could not bid to receive liquidity from an LPCO
- Establish an interest rate corridor; the NBC formally has no deposit facility, something that would form a standing facility "corridor" with the MLF. Still, de facto counterparties leaving their excess liquidity at 0% on their current accounts at the NBC are equivalent to a deposit facility at 0%, so a de facto corridor will form after an MLF is introduced.
- Create a tool providing liquidity in KHR to improve the effectiveness of liquidity management of KHR by banks and financial institutions
- Cap short-term interest rates on the interbank market

The MLF's characteristics are as follows:

- **Objective:** The MLF is a monetary policy instrument to help transmit the NBC's monetary policy and its liquidity management (and promote the use of the KHR in the banking system).
- **Eligible institutions:** All banks and microfinance counterparties recognized as

such by the NBC may access the MLF. The allotted liquidity amount under the MLF has no limit subject to the requirement of adequate collateral.

- **Maturity:** The maturity of credit extended under the MLF shall be overnight. The credit shall be repaid the next day on which payment systems are operational and at the time they open.
- **Interest rate:** The interest rate of the MLF shall be announced in advance by the NBC and calculated as a simple interest rate based on the actual 360 day-count convention. The NBC shall decide the MLF's rate on a regular basis and can change it at any time. Such a decision shall become effective from the following business day at the earliest. Until further notice, the MLF rate applied from [X] is [X]%.
- **Collateral requirement:** The NBC shall provide liquidity under the MLF through collateralized loans under the central bank's applicable regulatory arrangements. Counterparties must present sufficient eligible assets as collateral prior to using the MLF. The assets should be either pre-deposited with the NBC or delivered with a request for access to the MLF. Failure to comply with the obligation to put up sufficient eligible assets in advance as collateral will lead to financial sanctions from the NBC.
- **Eligible assets:** The NBC's negotiable certificates of deposit (NCDs) denominated in KHR and USD are the only eligible assets usable as collateral for the MLF. No haircut can be applied to a KHR-denominated NCD, and a haircut of 5% is applied to a USD-denominated NCD.

Table 3-3 summarizes the characteristics of NCDs, the LPCO, and the MLF as possible financial instruments for open market operations (OMO) by the NBC.

<Table 3-3> Summary of Instruments for OMO by NBC

	NCD	LPCO	MLF
Introduction date	September 2013	Late 2016	Late 2019
Purpose	• Develop money & interbank markets on secured bases • Reallocate financial resources among financial institutions • Provide additional option for liquid asset holdings • Deepen financial intermediation • Establish market-based instrument for monetary policy	• Set benchmark rate for market to serve conduct of monetary policy based on market mechanisms • Promote NCDs for use as collateral in interbank market transactions • Encourage use of KHR • Support agricultural development • Help lower interest rates for KHR-based loans	• Facilitate liquidity mgmt., promote use of KHR through overnight loan in banking system
Eligible security	N/A	• No haircut for KHR-based NCD • 3% haircut for USD-based NCD	• No haircut for KHR-based NCD • 5% haircut for USD-based NCD
Frequency of operation	• Weekly • Financial institutions can subscribe to NCD Wednesdays from 8 a.m.–2 p.m. • NBC issues NCD Thursdays	• Pre-announced schedule • 2 auctions per month • Auction session from 8 a.m. to noon • Results announced at 2 p.m.	Ad hoc
Counter-party	• Commercial bank • Specialized bank • Microfinance deposit-taking institution (MDI) • Microfinance institution (MFI)	• Commercial bank • Specialized bank • MDI	• Banks, financial institutions supervised, licensed by NBC
Settlement	T+1	T+2	
Maturity (days)	7, 14, 28, 91, 182, 364	91, 182, 364	

Auction procedure, basic interest rate	• Financial institutions need custodial account with NBC • Sufficient balance in current account required • Full amount of auction minimum rate • NBC to announce Wednesdays buy and sell rate on NBCP, NBC's official website. • Financial institutions can subscribe to NCDs on same day through NBCP • NCD issuance comes Thursdays	• Sign master agreement • Register with NBCP • Single-price Dutch auction • Minimum interest rate, other information announced at 8 a.m. on NBCP • Financial institutions can submit auction request through NBCP; if NBCP doesn't work, NBC to accept email or letter auction • All successful bidders can apply lowest interest rate	• Interest rate set by NBC
Remark	Financial institutions can redeem NCDs early by applying buy-back interest rate	Financial institutions can request rollover of LPCO at maturity date	No limit on liquidity amount except requirement of sufficient collateral provision

Source: Bank of Korea (2019)

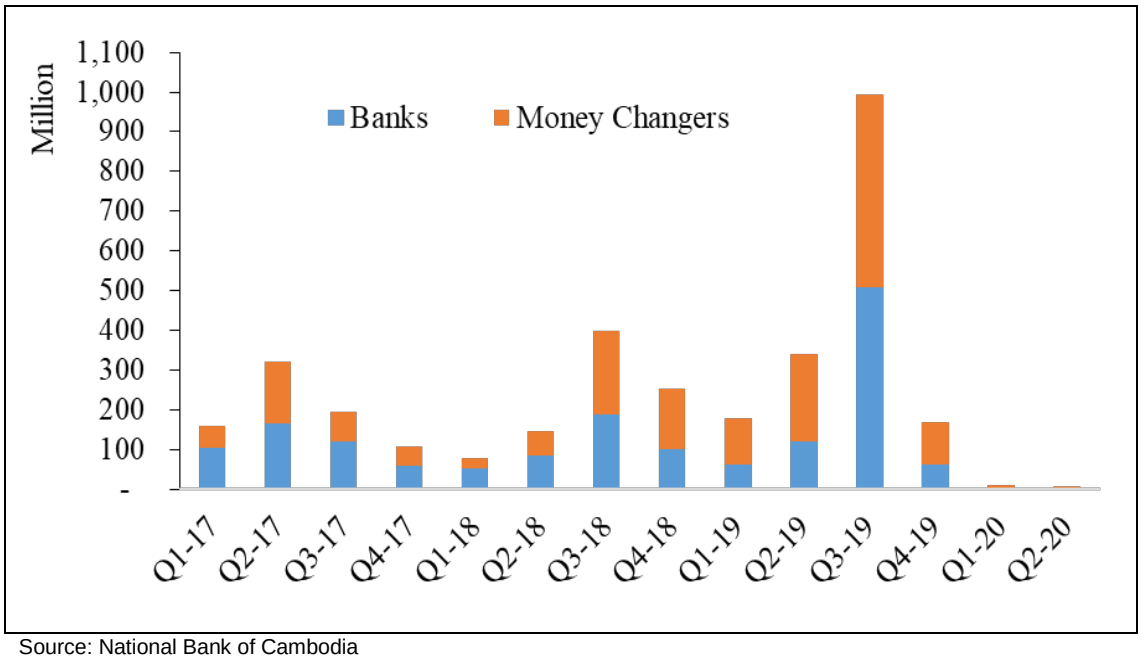
C. Foreign Exchange Intervention and Exchange Rate Policy

In a dollarized economy, the most effective policy tool of the central bank is usually the foreign exchange rate to maintain stability against a strong currency (USD), with the main objective of achieving price stability. Continuing to implement a managed floating rate regime, the NBC intervenes in the foreign exchange market by selling and purchasing KHR and USD with banks, microfinance institutions, and money changers to maintain the rate under the predetermined objective.

The NBC's official rate represents the bidding and asking prices of foreign exchange rates against the KHR for the central bank's transactions with third parties, serving as a benchmark for the private sector. The NBC sets the exchange rate through the following

process: (i) the rate is determined by the NBC's Official Exchange Rate Determination Committee, which comprises staff from relevant departments such as issuance, banking operations, exchange management, statistics, economic research, and international cooperation; (ii) the committee meets every weekday morning to set the official daily exchange rate by analyzing internal and external data. The rate is then posted every working day after approval from the Director General of the NBC's Central Banking Department; and (iii) if the exchange rate is volatile and out of the determined range, the committee can hold an urgent meeting on new strategies and approaches.

<Figure 3-8> Amount of USD Purchased by NBC (Q1 2017–Q2 2020)



Source: National Bank of Cambodia

2. Challenges and Constraints of Cambodia's Market-based Interest Rate Policy

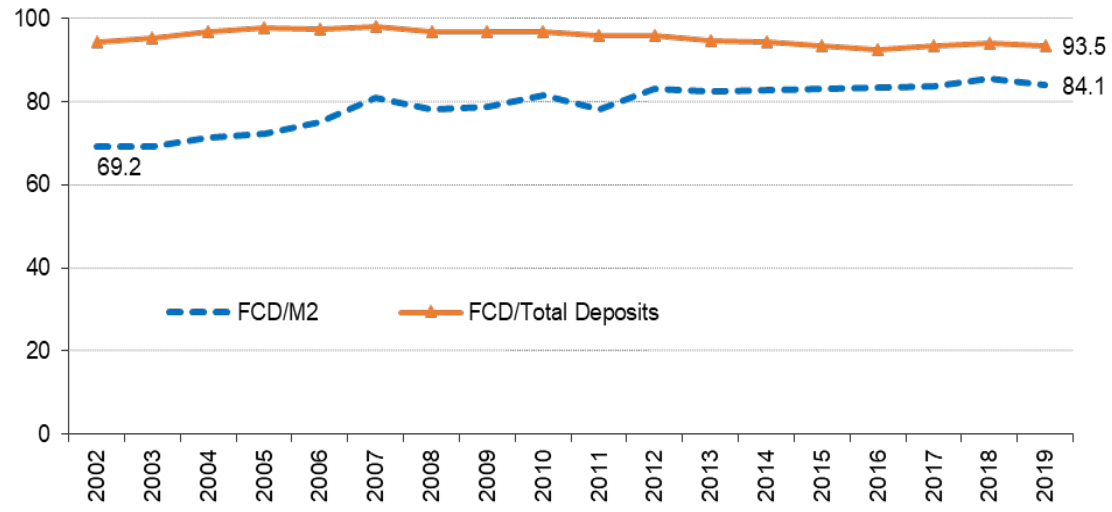
A. High Degree of Dollarization

To achieve preferred goals such as low inflation, a stable exchange rate, high economic growth, and full employment, a central bank conducts expansionary or contractionary monetary policy to influence the money supply. Mishkin (1995, 1996) and Weber, Gerke, and Worms (2009) said such a policy can affect the economy through channels including credit, interest rates, foreign exchange rate, and asset price channels. The central bank can boost economic growth by expanding the money supply to reduce interest rates and ease credit conditions to stimulate more consumption and investment. Meanwhile, monetary easing also fuels inflation as higher demand pushes up price levels. Yet if the money supply is reduced, the ensuing rise in interest rates will slow borrowing and spending and lower economic growth and employment, while reducing the inflation rate. Moreover, monetary policy can also affect exports and imports through the exchange rate since a rise or fall in the domestic currency's value makes domestic goods more expensive or cheaper than foreign goods. This can affect net exports and accordingly economic growth and price levels.

In a highly dollarized economy, however, where foreign currency is widely used in parallel with or instead of the domestic currency, monetary authorities have limited tools to directly affect overall monetary aggregates. The behavior of economic agents to hold assets denominated in foreign and domestic currencies affects demand for money and the exchange rate. The level of foreign currency in circulation cannot be accurately measured or effectively managed by a central bank, as people tend to hold a large portion of their funds in a foreign currency. In addition, the central bank is not a lender of last resort in a banking system with a large proportion of foreign currency in loans and deposits since the central bank lacks the authority to print foreign currency (Khou et al. 2015). Thus, the higher the degree of dollarization, the larger the foreign currency component in broad money and the harder it is for a central bank to implement monetary policy effectively.

Cambodia is known as one of the world's most dollarized economies, though its government has not officially adopted a policy to that end. Figure 3-9 shows that the country's degree of dollarization has remained extremely high, as the ratio of foreign currency deposits to broad money (FCD/M2) has stayed well above 80% and the ratio of foreign currency deposits to total deposits over 90%. Moreover, Tal and Dabadie (2007) and Naron (2012) said foreign currency account for about 90% of all currency in circulation, indicating small use of KHR in the economy. While USD transactions command the largest share of economic and financial transactions, KHR is commonly used for tax payments, the government's wage bills, and small transactions, especially in rural areas and agriculture. Given Cambodia's openness to international trade, tourism, foreign aid, remittances, and foreign direct investment, the country's dollarization is not expected to ease over the mid- to long-term. This will continue to limit the use of market-based instruments under the NBC's monetary policy framework.

<Figure 3-9> Degree of Dollarization in Cambodia



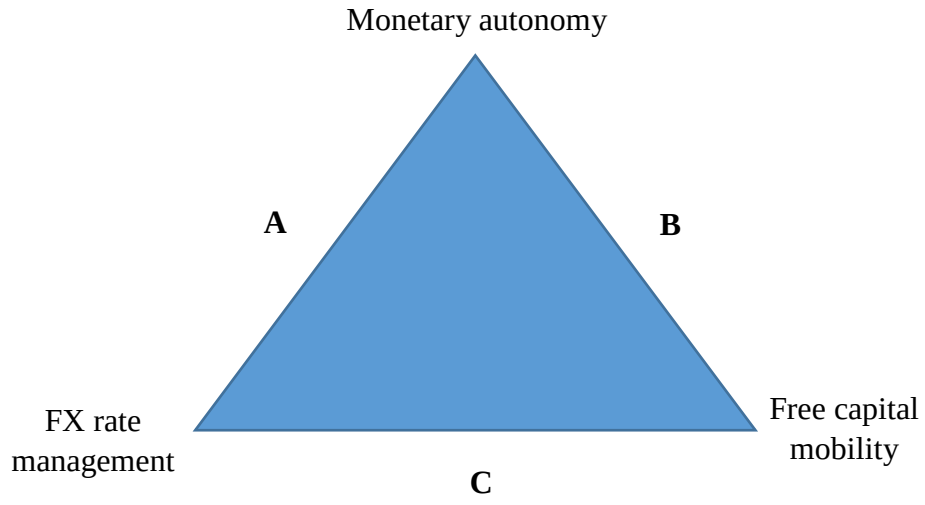
FCD = foreign currency deposits / M2 = broad money

Source: National Bank of Cambodia

B. Impossible Trinity

According to the "impossible trinity (macroeconomic trilemma)" concept, a country cannot control all three of the following variables at the same time: an independent monetary policy, a fixed exchange rate, and an open capital account. So, policymakers need to choose one side of the triangle to achieve two of the three objectives (Figure 3-10). To implement an independent monetary policy and control the value of the national currency (Side A), an economy cannot allow capital to flow freely. To gain monetary autonomy and free capital mobility means to allow the national currency to float (Side B). Openness to cross-border capital flows with a fixed exchange rate means no independent monetary policy (Side C).

<Figure 3-10> Macroeconomic Trilemma

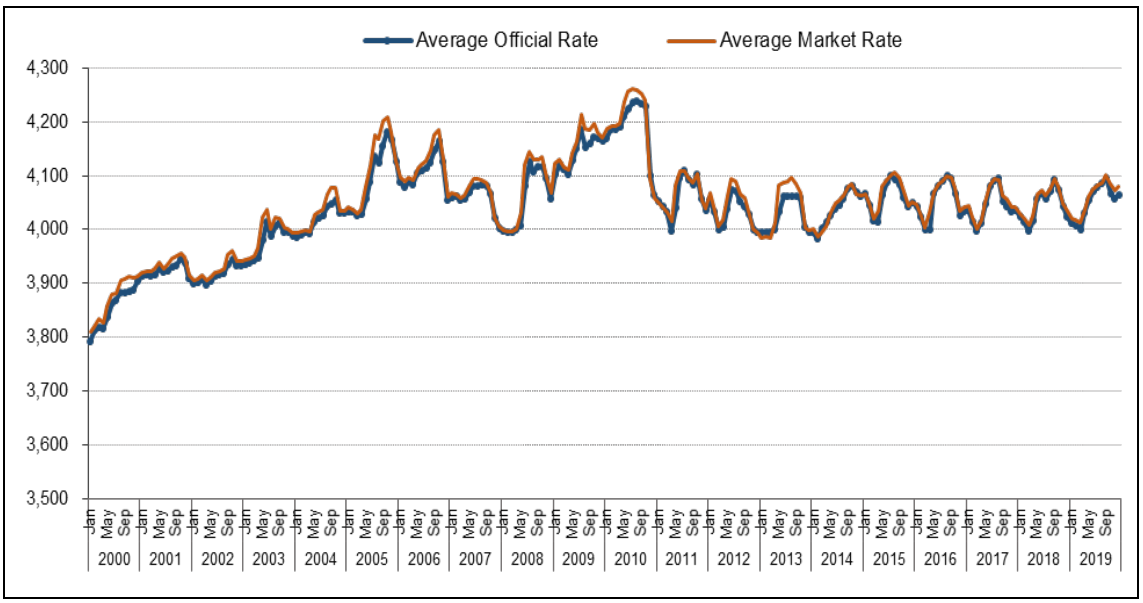


The National Bank of Cambodia (NBC) has adopted a system of a managed floating exchange rate as a key tool in monetary policy to promote price stability. To maintain rate stability based on market demand, the NBC normally intervenes in the foreign exchange market through purchases or sales of KHR with banks and major money changers. Figure

3-11 shows that the KHR-USD exchange rate remained stable over the last decade with a small fluctuation range of 4,000–4,100 riel per greenback, indicating a de facto fixed rate. The rate also slightly fluctuates by season as KHR tends to appreciate from October to April, when demand spikes to buy agricultural products, pay taxes and use small banknotes during major public holidays like Pchum Ben and Khmer New Year.

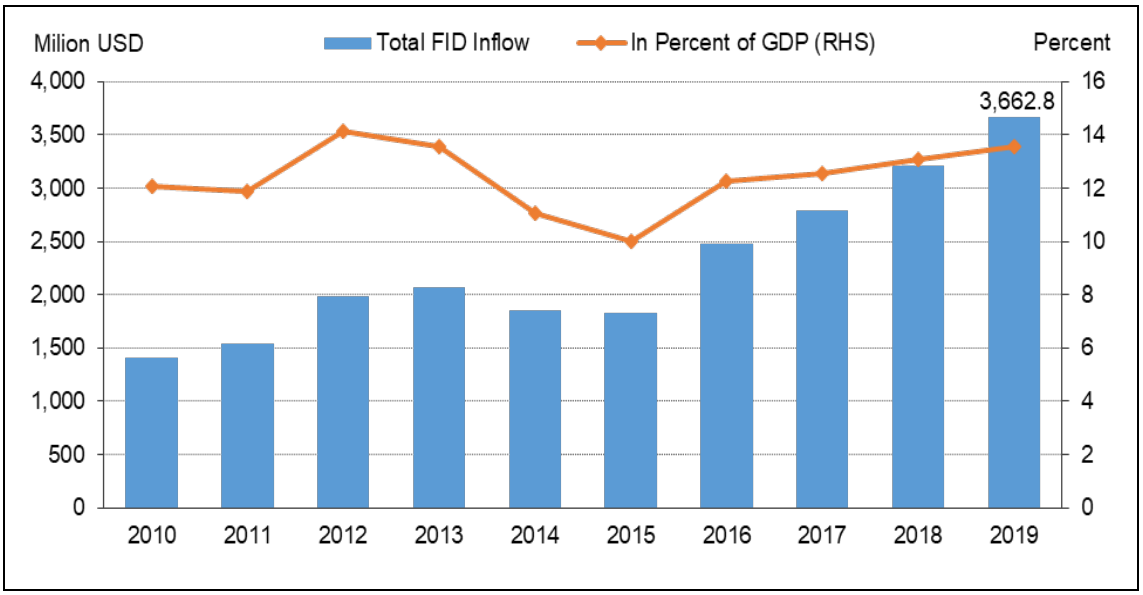
Meanwhile, the highly open Cambodian economy heavily depends on exports, particularly garments, tourism, and foreign direct investment (FDI) (Khou et al. 2015). Figure 3-12 illustrates that FDI reached USD 3,662.8 million or 13.6% of GDP in 2019, suggesting stable inflow of large foreign capital into this small economy. Thus, the impossible trinity concept implies that Cambodia cannot have an autonomous monetary policy since policymakers have pursued a stable exchange rate and free capital flows.

<Figure 3-11> Avg. KHR-USD Exchange Rate by Month



Source: National Bank of Cambodia

<Figure 3-12> Foreign Direct Investment in Cambodia



Source: National Bank of Cambodia

C. Underdeveloped Markets for Interbank and Government Bonds

Setting up solid and well-functioning interbank and government bond markets is crucial to facilitating a mechanism for monetary policy transmission. Central banks can set monetary policy tools to influence liquidity conditions in the banking system, while banks and financial institutions can manage their liquidity more effectively on an active interbank market. In addition, the availability of financial instruments like government or public bonds helps central banks conduct open market operations (OMO) by buying or selling securities with banks and financial institutions. Normally, the policy interest rate, a major tool of monetary policy in many countries, can be raised or reduced when central banks want to adjust the amount of reserves available in the banking and financial systems.

As highlighted in Cambodia's Financial Sector Development Strategy 2016–2025, the country's interbank and money markets remain in the early stage of development due to lack of an interest rate-setting mechanism, knowledgeable and professional staff and market participants, and other financial instruments as market options. The NBC has developed new market-based monetary instruments and platforms—namely the NCD,

LPCO and NBCP[24]—to encourage banks and financial institutions to conduct interbank transactions for effective liquidity management. Though these tools have spurred banks and financial institutions to directly participate in the auction process with the NBC, transactions in the secondary market remains limited as the lack of interbank market infrastructure means a high level of excess liquidity in the banking system (Bank of Korea 2019, p. 78).

The lack of a government bond market also hampers the NBC's ability to conduct OMO to adjust KHR liquidity in the banking system, which can consequently influence interest rates (Bank of Korea 2018, p. 48). Establishing this market will not only help raise funds, but also promote the use of KHR and serve as a secure financial instrument on the interbank market. Besides NCDs issued by the central bank, banks and financial institutions can have more options to park excess liquidity in government bonds, which are risk-free assets with longer maturity. Then these institutions can use government securities as collateral for interbank market transactions, particularly in the repo market. Moreover, the NBC can conduct OMO by selling or buying these securities to provide or absorb liquidity in the banking system. When banks and financial institutions actively participate in the interbank market, the central bank can also observe and adjust interest rates in the banking system according to market development and economic condition.

While corporate bonds have been developed, the Cambodian government is trying to establish regulations for issuing government securities. The success of the nation's first corporate bond issuance in December 2018 attracted several domestic companies looking for alternative financing sources to expand their operations (NBC 2019, p. 26). As of September 2020, three microfinance institutions (MFIs), two commercial banks and one import-export company have issued KHR-denominated bonds in Cambodia worth a combined KHR 572 billion (USD 140 million).

24) The NBC Platform is an online tool to allow financial institutions to trade their NCDs with one another by easing both the process of matching buyers and sellers and price negotiation, as well as executing transactions in real time.

Meanwhile, a bill on a law on government securities has been developed to help Cambodia's economic development and international relations. This is expected to usher in the era of government bond issuance, raise domestic financing, and reduce reliance on external borrowing. The bill was endorsed by the Council of Ministers on September 4, 2020, and awaits ratification by the National Assembly, after which the new law will replace the Law on Government Securities enacted in 2007. The historic issuance of government bonds is expected to start within the next two years, but the operational readiness of this market requires clarification through more guidelines and procedures for market participants.

3. Bank of Korea's Framework for and Implementation of Monetary Policy

From 1957, the Bank of Korea (BOK) operated monetary policy by setting money supply as a nominal anchor. The money supply indicator shifted from M1 to M2 and later to MCT amid changing circumstances in the financial market.[25] Specifically, reserve money was used as the operating target to attain a money supply target under the assumption that such money has a stable multiplier relationship with the money supply.

Financial innovation, however, made these indicators less effective as a nominal anchor. Following the Asian foreign currency crisis of 1997–98, the revision of the BOK Act specified price stability as the main objective of monetary policy. As a result, the BOK shifted from a system targeting monetary aggregates to one focused on inflation and adopted monetary policy oriented toward interest rates. The central bank has set its policy rate at a certain level and operated monetary policy to attain it. Specifically, the BOK employed the call rate target as its policy rate since 1998 before it has been changed to the Bank of Korea Base Rate since 2008.

25) MCT includes M2, certificates of deposit (CDs), and money-in-trust.

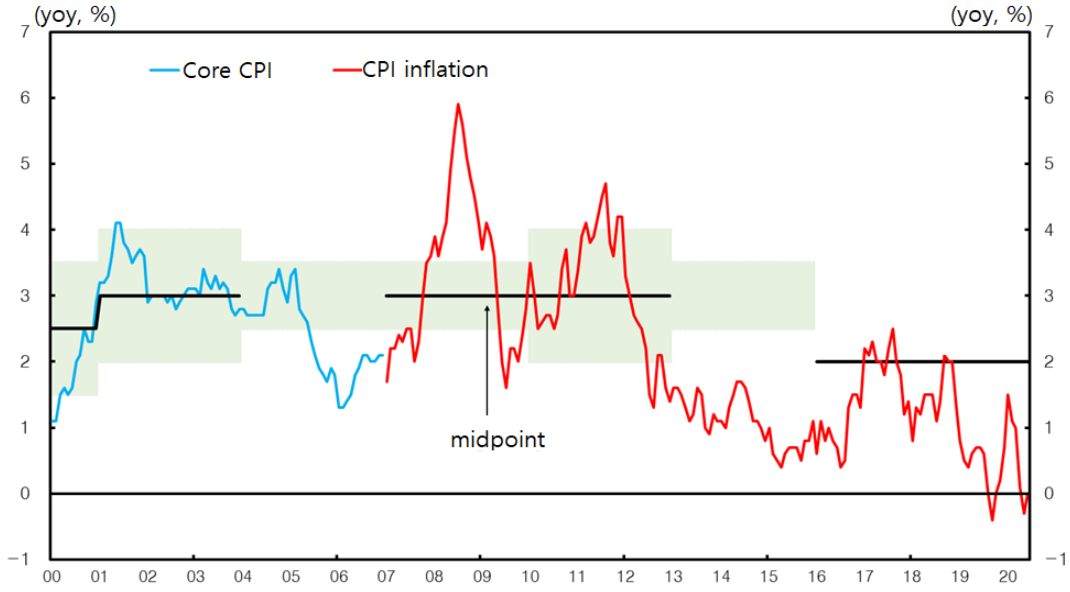
A. Inflation Targeting and Interest Rate-Oriented Monetary Policy

The BOK has inflation targeting as its monetary policy framework and sets an explicit inflation target on a three-year basis. The BOK conducts monetary policy accordingly to achieve the convergence of the actual inflation rate on the inflation target. To this end, the BOK sets its policy rate (the BOK Base Rate) and has the overnight call rate closely align with the BOK Base Rate using policy instruments.

Targeted and Real Inflation Rates

The BOK sets its inflation target level taking various factors into account such as price forecasts, domestic and foreign economic conditions, and the state of the financial market. The actual rate of CPI inflation recorded 7.5% in 1998 and 0.8% in 1999, both of which were below the lower bound of the targeted range for the annual inflation rate. This was due to unexpected changes in economic conditions so that the exchange rate, wages, and other production cost factors grew stable. The target index of the inflation rate changed from CPI inflation to the core inflation in 2000, which remained stable overall within its annual target range. From 2004 to 2006, a shift occurred from annual to a mid-term targeting system and the annual average core inflation rate remained at 2.3%, or slightly below the lower bound of its target range. Weak demand pressure and the strong Korean currency (KRW) caused price levels to go downward.

<Figure 3-13> Targeted and Real Inflation Rates in Korea



Note: The shaded area indicates the mid-term inflation target range.

Source: Bank of Korea's homepage

Figure 3-13 shows the reintroduction of CPI as the inflation target indicator in 2007, and from 2007 to 2009, prices rose an average of 3.3% per year, a rate within the inflation target range. Yet from December 2007 through April 2009, prices exceeded the upper bound due to soaring international oil prices and KRW depreciation following the 2008 global financial crisis. Despite the sharp increase in the prices of agricultural products in 2010, the annual inflation rate remained at its target midpoint of 3% but rose to 4% in 2011, exceeding the range's upper bound due to supply shocks including the sharp rise in international oil prices along with demand-side pressure.

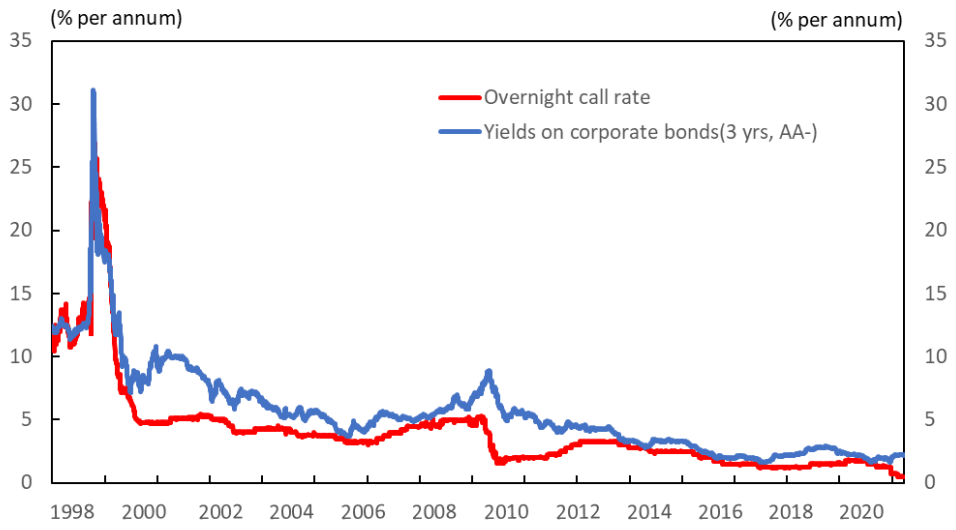
From 2012, the slowdown in the Korean economy and stable prices of international raw materials and agricultural, fishery, and livestock products quickly brought the inflation rate down to the lower bound (2%). CPI inflation rate remained below the lower bound of the target due to supply-side factors, including a decline in the prices of agricultural and petroleum products. Since 2014, CPI inflation rate has stood below the inflation target range mainly due to continuing downward pressure on demand and a decline in international oil prices.

Setup and Operation of Call Rate Target

Following the Asian foreign currency crisis that erupted in early December 1997, the BOK substantially raised the call rate to bring stability to the foreign exchange market. It pushed up the interest rate offered in its open market operations (OMO) and the overnight call rate to the upper limit of 25% per the Enforcement Decree of the Act on Interest Restrictions. This was soon followed by the rise of the overnight call rate to above 30%, with adjustment of the upper limit to 40%. Figure 3-14 shows that yields on corporate bonds also rose sharply. Though not explicitly saying so, the BOK from July 1998 began to present the operational direction of interest rates in its publication "The Direction of Monetary Policy for the Quarter."

As the domestic market for foreign exchange quickly regained stability, the BOK started easing its tight monetary policy. The reduction of the call rate target on September 30, 1998, was the first time for the BOK to use the rate as its official operating target. The BOK announced a cut in the interest rate offered in its OMO to the 7-percent level from the previous 8.1% to keep up with cuts by the US Federal Reserve and other advanced economies. As a result, the overnight call rate and other interest rates decreased simultaneously. Because the overnight call rate closely tracks the rate applied in OMO, this measure represented an important step toward a monetary policy regime that uses the overnight call rate as its operating target.

<Figure 3-14> Interest Rates after 1997–98 Asian Financial Crisis



Source: ECOS

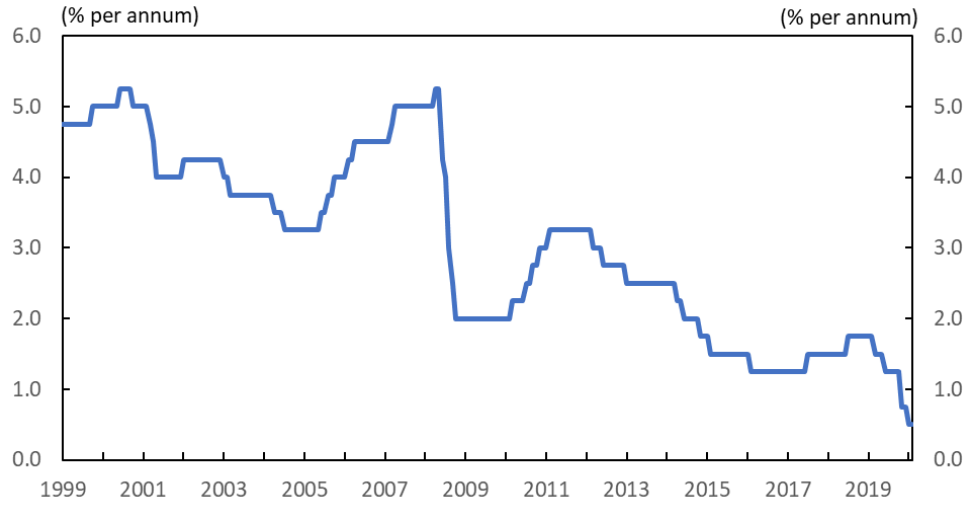
From early 1999, the level of the overnight call rate was given more emphasis in the publication "Monetary Policy Direction," with the rate decided at the monthly policy meeting of the BOK's Monetary Policy Board. A clearer statement that "the call rate will be stably operated at around the present level" was made at the board's meeting in May 1999. The call rate target was set at 4.75% because the rate had been moving around that level. Thus, the target functioned as the policy rate until it was replaced by the Bank of Korea Base Rate in January 2008.

Shift to BOK Base Rate

Call rate targeting greatly helped stabilize the Korean economy by allowing the BOK to stabilize prices and stimulate economic recovery. But the call rate stayed virtually fixed at the central bank's target level regardless of supply-and-demand conditions in the reserve market, resulting in the substantial weakening of the rate's fund-allocating role. And short-term fund transactions were excessively concentrated in the call market since the call rate served as the market rate for short-term loans. This had a negative effect on the development of other short-term financial markets, including that for repurchase

agreements (RP), and restricted the working of the monetary policy transmission channel running from policy rate modification to the real economy through the adjustment of long-term interest rates.

<Figure 3-15> Policy Rate Adjustments in Korea since 1999



Note: Changed from former call rate target to BOK base rate in March 2008

Source: ECOS

To tackle the problems associated with call rate targeting, the BOK in March 2008 replaced the call rate target with the central bank's base rate as its policy rate. The base rate is the reference rate applied in transactions such as RPs between the BOK and financial institutions, functioning as both the fixed rate for sales of securities to absorb excess liquidity and the minimum tender rate for purchases to provide liquidity. The call rate, however, is still considered the market interest rate that marks the point of departure for the transmission channel of monetary policy. Thus, the BOK is still trying to prevent the call rate from deviating greatly from the level of its base rate.

B. Implementation of Monetary Policy and Open Market Operations

The BOK's Monetary Policy Board sets the base rate eight times per year based on price movement, economic activity, and financial market conditions. The central bank attempts to steer the RP rate so that it converges with the newly set level of the base rate using monetary policy instruments.

After its establishment in 1950, the BOK had to rely on direct regulatory instruments such as setting the deposit and lending rates of commercial banks and controlling their lending scale. This proved effective in adjusting the money supply since the financial market was underdeveloped with no chronic excess demand for funds.

From the early 1980s, however, the expansion of the Korean economy and its structure fueled a growing need for operation under market principles. Accordingly, gradual deregulation of interest rates was pursued along with greater managerial independence for financial institutions, while monetary policy shifted to reliance on instruments for market-friendly indirect adjustments. As the money supply in the late 1980s expanded following the current account showing a surplus, market-based instruments for monetary policy such as open market operations (OMO), lending facilities, and reserve requirements were widely used to neutralize monetary expansion. The revised BOK Act that took effect in April 1998 specifies that the central bank must implement monetary policy in a market-friendly manner. Today, the BOK relies on indirect adjustment instruments such as OMO in implementing monetary policy.

OMO emerged as a major instrument of monetary policy in the 20th century. Since financial liberalization and innovation from the 1980s facilitated the development of financial markets, many countries have adopted OMO as their main instrument of monetary policy. Such operations are the policy instrument through which central banks purchase or sell securities including government and public bonds with financial institution in open markets such as those of money or bonds. Accordingly, the instrument leads to changes in funding conditions of such institutions and thereby adjusts reserves that they hold with the central bank and short-term interest rates.

OMO, however, does not allow the central bank to simultaneously meet its targets for

the reserve supply and the overnight interest rate. In other words, only one of the two targets can be met through OMO.[26] The BOK and its counterparts in major advanced economies use these operations as the main monetary policy instrument and adjust the amount of reserve supply so that the overnight call rate can approach the government target.

Basic Model of OMO: Channel vs. Floor System

Banks store their reserves at the central bank as a liquidity cushion to offset unexpected changes in deposits or loan demand. At any time, certain banks have an excess of reserves and others a shortage. Those with an excess lend their reserves to other banks suffering from a temporary shortfall. This reserve market provides banks with an important safety mechanism in the event that they incorrectly estimate their reserve needs; they can easily borrow or lend in such situations.

26) For example, when the central bank sets and attempts to meet a reserve supply target, changes in bank demand for reserves can occur due to reasons such as unexpected changes in bank deposits, thereby necessitating a change in interest rates. In contrast, if the central bank seeks to keep the short-term interest rate constant, it must adjust the reserve supply if a change occurs in reserve demand from financial institutions.

<Figure 3-16 > Channel System

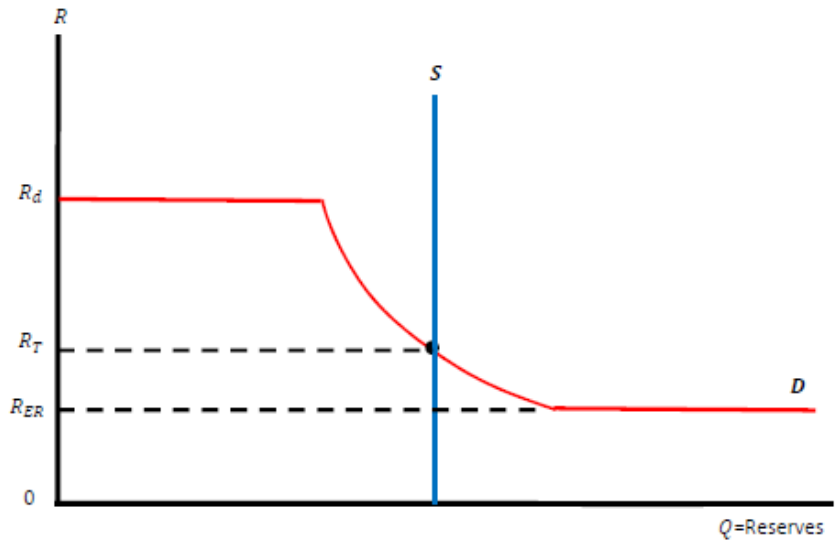


Figure 3-16 shows the basic mechanism of the market for reserves. The nominal interest rate on reserves *R* is on the vertical axis, and the quantity of reserves *Q* is on the horizontal axis. The quantity of reserves demanded by banks decreases with the interest rate on reserves, holding everything else constant. As the market interest rate on reserves increases, the opportunity cost of holding reserves rises and the quantity of reserves demanded falls. Alternatively, the higher the market rate for reserves, the more banks can earn by lending their reserves rather than holding on to them, so they demand less. Thus the demand for reserves represented by the curve ***D*** in Figure 3-16 slopes downward.

The market interest rate on reserves is bounded by the discount rate R_d and the interest rate for reserves R_{ER}. The upper bound is determined by the discount rate set by the central bank at a point which financial institutions with reserve accounts can borrow. The institutions will not borrow from the reserve market at a rate higher than the discount rate. Similarly, the lower bound is determined by the interest rate on reserves paid by the central bank. Financial institutions will not lend on the reserve market at an interest rate lower than R_{ER} because they can always lend to the central bank at R_{ER}. So, the demand curve for reserves is downward sloping and turns flat (infinitely elastic) at R_{ER}. Before the 2008 global financial crisis, financial institutions were not paid interest for reserves in almost all countries and the quantity of excess reserves held by banks was negligible.

This means that $R_{ER} = 0$ in Figure 3-16 was before the global financial crisis.

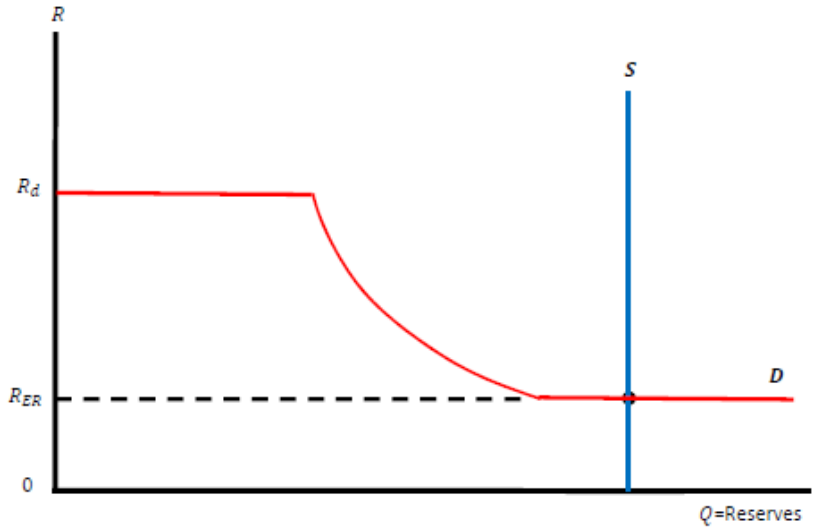
The position of the demand curve ***D*** on a given day is determined by activity in the financial payments system, including unexpected changes in overnight lending and borrowing by large financial institutions. So, on a given day, the central bank needs to predict the curve's position in Figure 3-16.

The supply curve ***S*** is vertical in Figure 3-16. At a given moment, the level of reserves supplied by the central bank is fixed and not sensitive to the market interest rate for reserves. Specifically, the reserve supply is determined by government intervention in the overnight financial market. For example, the central bank decides the quantity of reserves outstanding overnight by adjusting the quantity of RPs (collateralized lending by the central bank to financial institutions). Standard OMO like the buying and selling of government bonds by the central bank determines the mid- to long-term quantity of reserves in the system.

In Figure 3-16, R_T is the central bank's target interest rate on reserves. The goal of the central bank on a given day is to intervene so that the supply curve ***S*** intersects the demand curve ***D*** at the target interest rate. As the monopolistic supplier of bank reserves, the central bank can either set the price (interest rate) of reserves by adjusting supply or set the reserve supply by adjusting the price. In Figure 3-16, the central bank aims to move the market reserve rate to a specific target R_T. To do so, it supplies ***S*** volume of reserves to the banks.

The system described in Figure 3-16 is called a channel (or corridor) system, under which the overnight interest rate for reserves falls in a channel defined by the central bank's lending or discount rate R_d (the upper bound of the channel) and the reserve rate paid by the central bank R_{ER} (the lower bound).

<Figure 3-17> Floor System



In practice, the central bank estimates where the bank demand curve lies and then sets the reserve supply by buying or selling securities to hit its reserve rate target. Because the reserve demand curve is downward sloping within the channel, a one-to-one relationship exists between the reserve volume that the central bank supplies and the level of the market interest rate for reserves. If the central bank wishes to raise or lower its reserve rate target, it can buy or sell securities to raise or reduce the reserve supply. Should the demand for reserves unexpectedly shift, the central bank can alter the supply accordingly to maintain its rate target.

In general, the effects of OMO depend on whether the supply curve S initially intersects the demand curve ***D*** in its downward-sloped section (or within the channel or corridor) versus its flat section in Figure 3-16. For instance, such operations have no effect on the market interest rate for reserves when intersection occurs at the flat section of the demand curve. With a sufficiently large stock of interest-bearing reserves outstanding after the 2008 global financial crisis, the reserve market would work as in Figure 3-17. That is, if the supply curve ***S*** lies sufficiently far to the right, the interest rate for reserves R_{ER} should determine the market rate.

The system of central bank intervention is called a floor system, as the floor on the overnight reserve rate R_{ER} determines the market overnight interest rate for reserves. In

principle, a floor system should greatly simplify the interest rate targeted by the central bank. As an intermediate step to hitting a target for the reserve rate, the central bank could simply ensure a sufficiently large quantity of reserves outstanding each night instead of forecasting daily reserve demand. Then the administered interest rate for reserves R_{ER}, set at the targeted rate, should determine the market rate.

BOK's Process of OMO under Channel System

The BOK's interest rate-oriented monetary policy is operated under a channel system. The overnight interest rate on reserves falls in a channel defined by the BOK's rediscount rate R_d as the upper bound of the channel and the zero-interest rate on reserves $R_{ER} = 0$ as the lower bound.

The aim of the BOK's OMO is to keep the call rate—specifically the unsecured overnight call rate—from deviating sharply from the base rate set by the Monetary Policy Board. The call rate is significantly affected by the amount of bank reserves because banks seek to resolve a reserve shortage or surplus through the call market, where short-term funds are traded (typically overnight loans). So to achieve the OMO's goal, a shortage or excess of bank reserves must be identified and appropriately resolved.

If the supply of reserves far exceeds demand, banks will try running their non-profit surplus reserves (reserves on hand minus those required) on the call market, leading to a large supply of call money and downward pressure on call rates. In contrast, if reserves on hand fall short of the required amount, heightened bank borrowing from the call market will apply upward pressure on call rates.

The BOK predicts demand for reserves by considering a number of factors, comparing reserve demand with supply, and calculating a surplus or deficit. If a deficit is expected, the Bank of Korea will inject liquidity, and if a surplus is forecast, it will absorb liquidity. This way, the central bank conducts OMO so that call rates do not deviate significantly from the base rate.

BOK's Instruments for OMO

The main instruments of open market operations (OMO) include the issuance of the monetary stabilization bond (MSB), securities transactions, and deposits in the monetary stabilization account (MSA). First, MSBs issued only by the BOK were a major instrument of monetary policy amid an insufficient volume of government and public bonds that are essential for OMO. An MSB has a relatively long maturity, and once issued, it cannot be redeemed prior to maturity in principle. The bond is thus used in major structural adjustments with long-lasting policy effects. A ceiling on MSB issuance is set by the BOK's Monetary Policy Board (MPB) every quarter; those with maturities of 91 and 182 days and one or two years are issued regularly through competitive bidding. The fungible issue period for one- and two-year MSBs is one and two months, respectively, and subscription is held once a month. Twice in every odd month like January, March, or May, two-year MSBs with remaining maturities of three, five, seven, and nine months are repurchased by the BOK before maturity to ease maturity concentration and boost liquidity.

Second, securities transactions are used to supply or withdraw funds by buying or selling government and public bonds. Those eligible are government and government-guaranteed bonds, MSBs, and mortgage-backed securities (MBS) issued by the Korea Housing-Finance Corporation considering the efficiency of OMO and the credit risk of the relevant securities. If necessary, bonds specifically determined by the MPB can be included.

Securities transactions come in two types: outright and RP. Outright sales are hardly used as it has the same effect as MSB issuance, while outright purchases are infrequently used to supply liquidity because market liquidity is generally in surplus. So such purchases are utilized only if the need to secure government bonds arises for RP sales or to stabilize the financial market.

As a result, most securities transactions fall into the RP category. The BOK buys or sells government bonds to financial institutions and repurchases or resells them upon maturity, so it can absorb or supply funds until the end of the maturity date. The longest

RP maturity is 91 days, but the majority of RP transactions involve seven-day RPs, whose interest rate is the BOK's Base Rate. Since the reserve maintenance period for banks was raised in 2012 from half a month to an entire month, 14-day RPs have occasionally been used. Meanwhile, if the central bank lacks sufficient government bonds for the RPs it needs to sell, it can borrow the bonds from financial institutions.[27]

<Table 3-4>BOK Instruments of OMO

		Method of operation	Securities eligible
Long-term adjustment	Withdrawal	Issuance of long-term MSBs	–
	Supply	Repurchases of MSBs with long-term remaining maturities	–
Short-term adjustment	Withdrawal	Sales of RPs	Government bonds, government-guaranteed bonds, and MBSs issued by the Korea Housing-Finance Corporation, held by the Bank of Korea,
		Attraction of MSA deposits	–
		Issuance of short-term MSBs	–
	Supply	Purchases of RPs	Government bonds, government-guaranteed bonds, MSBs and MBSs issued by the Korea Housing-Finance Corporation, held by institution counterparts
		Repurchase of MSBs with short-term remaining maturities	–

Source: Bank of Korea (2017)

Finally, the monetary stabilization account (MSA), a term-based deposit facility, is an OMO instrument used by the BOK to control short-term liquidity. In normal times, the central bank accepts deposits from financial institutions in a competitive bidding. It can,

27) The BOK's lending and borrowing of securities have been allowed since the amendment to the Bank of Korea Act of December 17, 2011. Ordinarily, the central bank uses this method to borrow government bonds from financial institutions to sell RPs. It can, however, be also used to make loans to financial institutions having difficulty raising funds such as during a financial crisis. In this case, the central bank lends government bonds, which usually have good liquidity, against the security of risky bonds held by financial institutions.

however, also require financial institutions to make deposits in MSAs in exceptional situations, including rapid credit expansion. The maturity of deposits in the account is under 91 days, but the BOK largely accepts deposits in MSAs with a maturity of under a month such as 28-day deposits to ensure flexible fund operations by financial institutions. Early withdrawal of MSA deposits is restricted, and the amount deposited is not considered part of reserves.

Table 3-4 summarizes OMO instruments used by the BOK in the implementation of monetary policy focused on interest rates. Table 3-5 shows the outstanding (year-end) balances of instruments used for OMO from 2016 to 2019.

<Table 3-5> Performance by OMO Instruments

(Unit: end of year, KRW 1 tln)

		2016	2017	2018	2019
Outstanding MSBs		168.4	170.8	171.6	164.1
RPs	Sales	12.9	10.0	5.0	8.0
	Purchases	0.0	0.0	0.0	0.0
MSA balance		18.7	13.5	7.0	3.5

Source: ECOS

4. Feasible Implementation of Interest Rate-oriented Monetary Policy in Cambodia

The National Bank of Cambodia (NBC) has not set an official policy rate, despite being able to adjust the rates for LPCOs and NCDs. This could impact the market interest rate in KHR. Based on the Bank of Korea's (BOK) experience with an interest rate-oriented monetary policy, this section will offer proposals for feasible implementation of such a policy in Cambodia including the policy rate and the OMO process. In doing so, Cambodia's financial infrastructure must be considered such as the exchange rate system, the short-term money or interbank market, and the government bond market.

First, Mundell-Fleming's policy trilemma as discussed in Section 2 (B. Impossible

Trinity) said a country can only choose to simultaneously have two out of the following three at any time: free capital mobility, exchange rate management, and monetary autonomy. Cambodia effectively fixes its foreign exchange rate against the USD and is also open to foreign capital flows. If the NBC sets the policy rate above that set by the US Federal Reserve, an inflow of foreign capital in search of higher returns would ensue and raise demand for KHR, which would eventually break the peg with the greenback. In reality, constraints or restrictions on capital mobility could arise such as risk premium, cost of moving funds across borders, regulation, and lack of infrastructure. But to create an environment where an interest rate-oriented monetary policy can be effective, the NBC should allow the exchange rate to move more freely.

Second, both the interbank and government bond markets play a key role as a bridgehead for the transmission of monetary policy throughout the economy. As discussed in Section 1 (Monetary Policy Framework of the National Bank of Cambodia), Cambodia has three active interbank market instruments for implementing OMO: the negotiable certificate of deposit (NCD), the liquidity-providing collateralized operation (LPCO), and the marginal lending facility (MLF).[28] We propose the following instruments of OMO to raise the effectiveness of an interest rate-based monetary policy for the NBC.

A. New Instruments of OMO

Expansion of LPCO to NBC RP Market

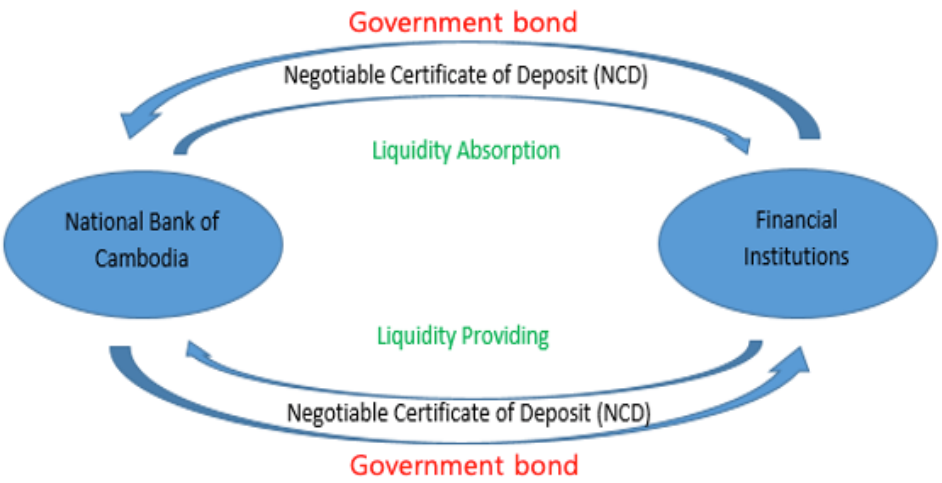
Launched in September 2016, the LPCO is one of the NBC's main instruments of monetary policy used to provide KHR-based liquidity to eligible financial institutions. The purposes of the LPCO are (i) to promote the use of KHR; (ii) support the agricultural sector; (iii) stimulate the development of the interbank market; (iv) develop the secondary NCD market; and (v) advance the repo (RP) market.

28) The descriptions of NCD, LPCO, and MLF below closely follow those of the BOK (2019, pp. 48–55).

The LPCO is considered an RP transaction because at maturity, banks and MFIs must buy back NCDs pledged as collateral. The LPCO can be improved upon by better matching NCD and LPCO maturities, as in banks can use a 364-day NCD as collateral for a 360-day LPCO to avoid any gap at maturity.

The NBC can adjust the interest rates for the LPCO and NCD, something that could impact the market interest rate for KHR. The LPCO allows the NBC to implement open market purchases to lower its target LPCO rate, but not an open market sale to raise it. To make RP trading the main instrument of OMO, the LPCO needs expansion into the NBC repo market with eligible assets like government bonds as well as NCDs.

<Figure 3-18> NBC Repo Market



Issuance of Long-term NCDs

The NCD is a short-term, interest-bearing debt issued by the NBC since September 2013 following a Prakas (banking or financial regulation) on the Issuance of Tradable Securities by the National Bank of Cambodia" on October 10, 2010. According to the Prakas, the main objectives of an NCD are (i) to promote the development of the money market and interbank lending on secured bases in which the securities issued can serve as collateral for repo transactions; (ii) provide (interbank) market participants with alternative liquidity reserve assets to supplement fixed deposits with the NBC; and (iii)

establish additional instruments aimed to support the implementation of NBC policy vis-a-vis monetary supply and foreign exchange (NBC 2010, p. 510).

The maturity of KHR-denominated NCDs ranges from two weeks to a year, whereas that of USD-denominated NCDs ranges from two weeks to six months. A one-year NCD was issued to allow banks with longer-maturity securities to invest and facilitate the collateralization of LPCO to up to one year.

Given the country's lack of a government bond market, the NBC should consider expanding NCD issuance, including long-term ones. As discussed in Section 3 (Bank of Korea's Monetary Policy Framework and Implementation), the BOK issued the Monetary Stabilization Bond (MSB) as a major instrument of monetary policy at a time when the volume of government bonds, an essential element of OMO, was insufficient.

Government Bond Market

As discussed in Section 2 (C. Underdeveloped Interbank and Government Bond Markets), Cambodia's Council of Ministers endorsed in September 2020 a draft law on government securities; its adoption by the National Assembly is pending. Provided that the operational readiness of the government bond market is clarified with more guidelines and procedures for market participants, government bond issuance is expected to start over the next one or two years.

The government securities market will not only provide the foundation for money markets but also help facilitate the development of the interbank market for implementing an interest rate-oriented monetary policy. Considering that government securities could be a major instrument for promoting the use of the KHR, a broad-based market for government bonds is essential for OMO.

To promote the development of an "NBC repo market" for implementing an interest rate-oriented monetary policy, Cambodia should soon open the market so that government or other public bonds are used as collateral in RP transactions. Once the market is up and running, the NBC can conduct OMO by selling or buying government bonds to provide or absorb liquidity in the banking system.

Table 3-6 summarizes the NBC's instruments of OMO, including new ones that we propose here.

<Table 3-6> NBC Instruments of OMO

		Method of operation	Securities eligible
Long-term Adjustment	Withdrawal	Issuance of long-term NCDs	-
	Supply	Repurchases of NCDs with long-term remaining maturities	-
Short-term Adjustment	Withdrawal	Sales of RPs	government bonds held by the National Bank of Cambodia
		Issuance of short-term NCDs	-
	Supply	Purchases of RPs	NCDs, government bonds, held by banks and MFIs
		Repurchase of NCDs with short-term remaining maturities	-

B. OMO under Channel System

The forthcoming development of a government bond market in Cambodia means the NBC can set the policy rate as the reference rate applied in transactions such as RPs between the NBC and banks or financial institutions to either absorb or inject liquidity. Following the BOK's implementation of interest rate-based monetary policy, the NBC can closely align the overnight RP rate with its policy rate by buying or selling RPs as the main instrument of OMO under a channel system.

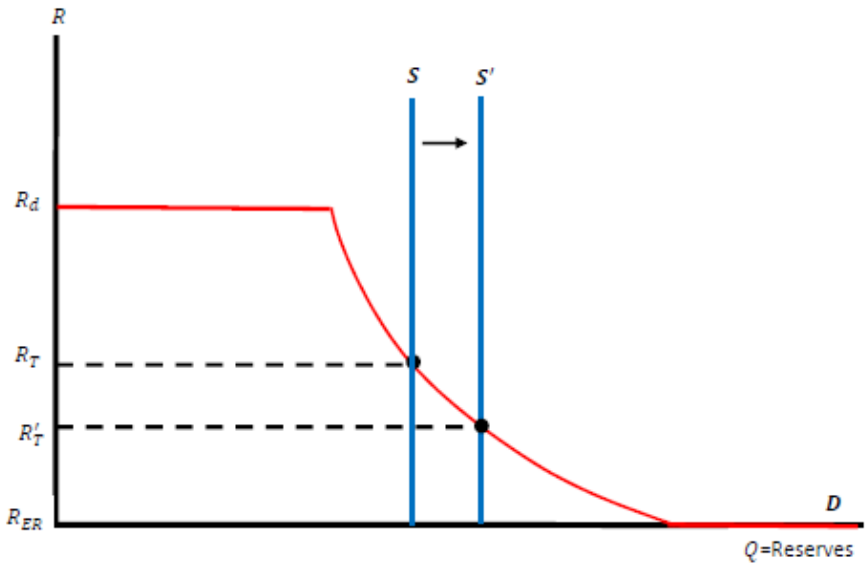
Specifically, Figure 3-19 shows the NBC's overnight interest rate for RP falling in a channel defined by the zero-interest rate on reserves $R_{ER} = 0$ as the lower bound in the channel. The NBC's interest rate on the marginal lending facility (MLF) can serve as the upper bound of the interest-rate corridor in the channel system.

As discussed in Section 1 (B. Open Market Operations), the MLF's interest rate determines the upper bound in the interbank market's interest-rate corridor at a level deemed appropriate for economic fundamentals by the central bank. That is, the interest

rate of this operation will serve as a ceiling for short-term interest rates in the interbank market. In doing so, banks and financial institutions will not seek liquidity from this market if the interest rates on that credit are higher than those of MLF offered by the central bank.

Suppose that in Figure 3-19, R_T is the NBC's target interest rate for RP. The central bank's goal on a given day is to intervene in the repo market so that the supply curve ***S*** intersects with the demand curve ***D*** at R_T. If the NBC wishes to raise or lower its target RP rate, it can buy or sell RPs to raise or reduce the supply of reserves through OMO. And if an unexpected shift in reserve demand occurs, the NBC can accordingly alter the supply to maintain its target RP rate.

<Figure 3-19> NBC's OMO: Channel System



Yet the market interest rate is effectively tied to that of the US Fed due to high level of dollarization and the low level of domestic currency (KHR) use. The interest rates on the NBC repo market can only affect KHR, which still accounts for a relatively small proportion of both loans and deposits in the financial system. So, setting the policy rate vis-a-vis the rate for NBC RPs might prove ineffective in a highly dollarized economy.

The general policy of de-dollarization is broad and beyond the capacity of the NBC

alone to implement. The central bank has implemented several measures to promote the use of KHR under a mid- to long-term strategy for de-dollarization. The leading example is the LPCO, which has been developed as a lending facility to provide liquidity in KHR. But more participation from both public and private stakeholders is necessary for consistent and successful efforts toward de-dollarization. Finally, to stimulate the use of KHR and the development of an interbank market necessary for implementing monetary policy oriented toward interest rates, the formation of a government bond market in the near future is strongly recommended.

IV. Promotion of FX and Currency Swaps

1. FX and Currency Swap Markets in Cambodia

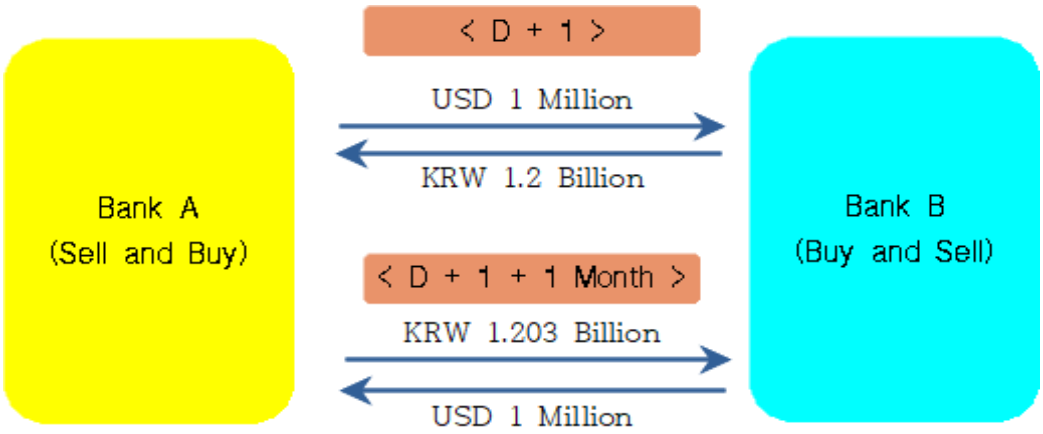
A. Overview

Derivatives are traded on foreign exchange markets. Swaps are derivatives used for swapping cashflow streams and in most instances, they are used for hedging purposes. Two types of swaps are widely used in swapping foreign currencies through minimizing foreign exchange rate risk: currency and FX. Although similar, they differ in structure and function.

FX Swaps

An FX swap is a contract between two parties who agree to buy or sell a specific amount of a currency at an agreed rate and later buy or sell the same amount of currency at an agreed rate. The first of this transaction's two stages sees a specific amount of a currency bought or sold against another currency at the prevailing spot rate. The second stage has an equal amount of currency bought or sold against the other currency at the forward rate.

<Figure 4-1> Example of FX Swap



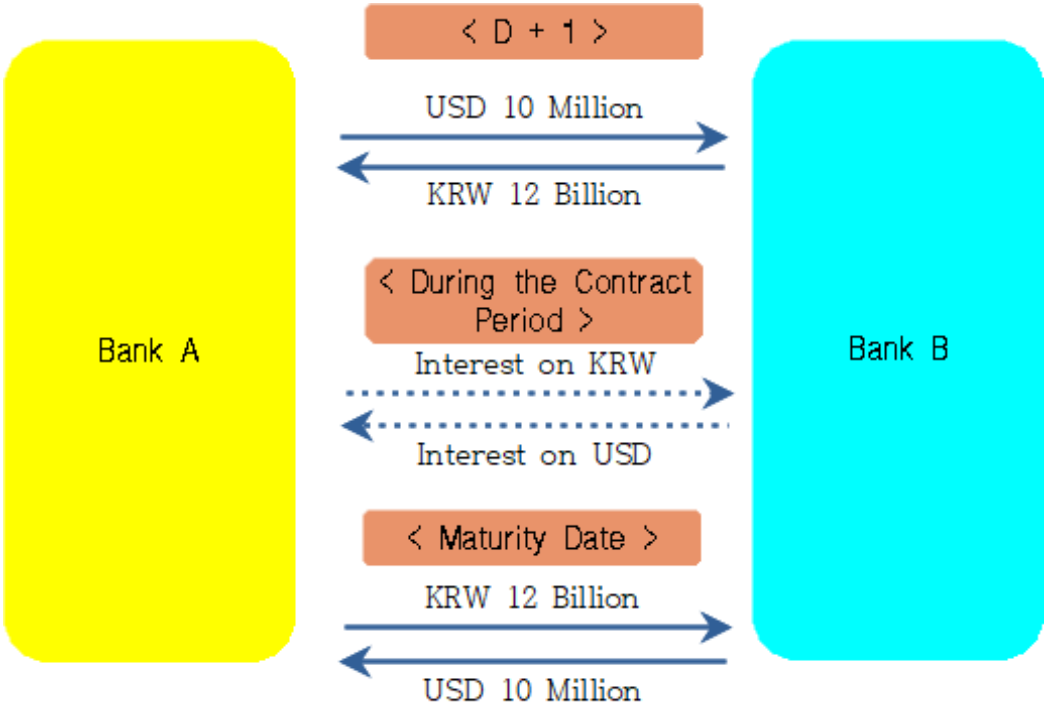
In a simple example, Bank A has USD 1 million and requires KRW for a month,

while Bank B has enough KRW but needs USD. Both can use their funds to fulfill their respective requirements without exposure to foreign exchange rate risk. Bank A can sell USD 1 million to Bank B at the spot rate and receive an equivalent sum in the greenback, and agrees to buy back the KRW and sell USD in a month.

Currency Swaps

A currency swap is an agreement between two parties to exchange specific amounts in different currencies. A typical transaction of this type requires a foreign exchange agreement in which two parties exchange or "swap" a series of payments in one currency for those in another. The payments exchanged are interest and principal payments of a loan denominated in one currency for that of an equal amount in another currency.

<Figure 4-2> Example of Currency Swap



For example, Bank A needs KRW and Bank B USD. In this situation, Bank A will borrow the Korean currency and Bank B the greenback. On the maturity date, Bank B

will pay Bank A's debt denominated in USD (including principal and interest payments made in USD), and Bank A will pay Bank B's debt denominated in KRW (principal and interest payments made in KRW). For this exchange to be successful, a fixed or floating interest rate agreed on for the borrowed amount and a maturity date must be set. A currency swap presents a competitive advantage to the parties involved as they can borrow foreign currency at lower cost and with less exposure to foreign exchange rate risk.

Differences between FX and Currency Swaps

Currency and FX swaps are similar in that they help hedge foreign exchange risk and offer corporations a mechanism in which foreign currency can be obtained with minimal exposure to foreign exchange rate risk. Nevertheless, both derivatives differ in that a currency swap exchanges a series of cashflows (interest payments and principal), while an FX swap involves two transactions: sell or purchase at the spot rate and repurchase or resell at the forward rate.

The other major difference is that a currency swap is a loan taken out by each party in which interest and principal payments are then exchanged. In contrast, an FX swap is conducted by exchanging an available amount in one currency for an equivalent amount in another.

In summary, an FX swap is a contract between two parties who simultaneously agree to buy or sell a specific amount of a currency at an agreed rate and later buy or sell the same amount of the same currency at an agreed rate. A currency swap is an agreement in which two parties exchange or "swap" a series of payments (interest and principal) in one currency for those in another. Currency and FX swaps are similar in that they help hedge foreign exchange risk and offer corporations a mechanism through which foreign currency can be obtained with minimal exposure to foreign exchange rate risk.

B. Why Cambodia Needs an FX Derivatives Market

The NBC promotes the development of foreign exchange swap products and a related market with the goal of providing hedging instruments for investors of KHR-denominated assets. As the monetary authority of a highly dollarized economy, the central bank is aggressively trying to promote the use of the domestic currency, and one such effort is to encourage the issuance of KHR-denominated assets such as stocks and bonds for listing on the official exchange. Today, Cambodia requires all listed stocks and bonds in the country to be denominated in KHR, and this offers an opportunity for investors holding the domestic currency but poses a challenge for those with USD as their base currency. Despite a stable exchange rate between both currencies over the past two decades of KHR 4,000–4,100, most investors, especially foreign, remain reluctant to or are banned from having large exposures to KHR exchange rate risk. They thus often require a hedging instrument to accompany their investments in KHR-denominated assets.

Obtaining FX and currency swap products in Cambodia remains a challenge for those with USD as their base currency and who try to hedge their exposure to KHR exchange rate risk. This is because of the limited notional amount available, high associated cost and tenor that is mainly under a year. The lack of a well-functioning FX derivatives market is thus a disincentive to foreign investors and banks to hold KHR-denominated assets and runs counter to the NBC's objective of promoting assets denominated in the national currency.

While demand for FX derivatives comes mainly from foreign investors and banks, it could also come from corporations and small to medium companies over the long term if they can manage the ensuing risk. The opening and operation of a well-functioning market for such derivatives are thus imperative tasks for Cambodia to provide hedging instruments for all economic sectors.

C. State of FX & Currency Swap Markets and Challenges

The FX and currency swap markets in Cambodia remain in a nascent stage, with the notional amount outstanding estimated to be under USD 100 million with KHR and USD as the main swap currencies. The term for FX swaps can range from a few months to a year and that of currency swaps can last up to three years, though such a long tenor is in short supply. Most of these swaps are deliverable with an exchange of principal in the beginning and at the end of the contract period. The most active providers and users of FX swap products are banks and microfinance institutions (MFIs).

Often for the providers, providing FX swaps is not done for the purpose of earning active profit but rather putting to efficient use idle surplus funds in KHR. Certain non-banking companies in international development finance also offer FX and currency swaps, but the amounts are small and the associated costs high. Derivatives brokers in Cambodia have little interest in offering these products, the markets for both swaps are rather inactive, and deals are bilaterally negotiated on an occasional basis.

Demand for FX and currency swaps to protect against KHR exchange rate risk has increased in recent years after the NBC required banks to increase their KHR-based loans to at least 10% of their loan portfolios by the end of 2019. Due to an insufficient number of KHR-based funding sources, many had to fund this loan expansion with their USD holdings and thus required additional FX swaps to cover their net open positions for foreign currency.

Because of the short supply of FX swap contracts, the NBC introduced the liquidity-providing collateralized operation (LPCO), which has the same economic characteristics as a deliverable FX swap. This facility eased the KHR shortage among banks while keeping their net open positions for foreign currency in check. Since its introduction, the LPCO has proven to be a popular instrument with over USD 1 billion of notional outstanding amount as of mid-2020.

The LPCO only allows participation from banks, while most tap it for their own internal use; others source FX swaps from LPCOs, thus allowing them to structure and offer FX swaps to retail clients. The pricing of FX swaps, once a challenge due to the lack of a

KHR risk-free yield curve, started using the LPCO as a benchmark for pricing retail level products. As the LPCO's tenor is kept under 12 months, currency swaps with longer terms remain expensive for longer-term investors with USD as their base currency.

Despite few regulatory restrictions, the private sector-led development of the market has been slow. While most smaller banks lack the technical expertise to develop these products, the larger ones with the proper know-how often do not consider this business attractive enough to actively pursue. The lack of market development in this product space can be attributed to low demand because of limited financial assets denominated in KHR and thus little KHR exposure that USD-based investors have hedging requirements for. This could also be true for the opposite reason, where the lack of FX hedging instruments could cause low issuance of KHR-denominated assets, as most investors use USD as their base currency. Pricing and valuing the swap are also challenging as Cambodia lacks a risk-free curve because of no government securities. The lack of hedging requirements also stems from the absence of exchange rate volatility between KHR and USD, whose exchange rate has remained stable over the past two decades. Another reason is that banks are reluctant to take on more foreign exchange risk in their balance sheets as allowed for fear of exchange rate risk, though they have the capacity to do so. The lack of surplus KHR-based funding despite the LPCO is still the main constraint for banks wishing to increase the availability and affordability of FX swaps. Encouraging deposits in KHR is thus an important task in providing the needed funding for banks in the domestic currency.

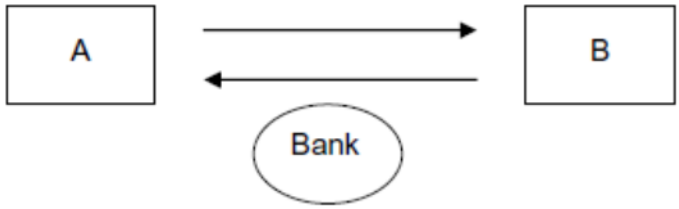
2. Cases of Developing Markets for FX and Currency Swaps in Korea and Elsewhere

A. Evolution of Swap Markets for Major Currencies

The discussion below refers to the evolution of early swap markets for major currencies during the 1980s. This is applicable to many other markets as they develop. The development of a swap market typically has three phases.

(Phase 1)

The earliest days of a market had a highly arranged setup in which two swap end users negotiated directly with each other, and an “advisory” bank could charge an upfront fee for locating and assisting them. This obviously slow market saw documentation frequently tailored for each transaction. The main banks involved were investment or merchant banks that were long on people but short on capital and technology since they took on no risk. Typical counterparties were highly rated and thus happy to deal directly with each other.



The first swap markets for major currencies were even slower given considerable doubt over swap efficacy. End users were dubious about moving their activities off their balance sheets, and apprehension arose that changes in accounting rules would force them back to such sheets. The historic 1981 swap between the World Bank and IBM (described in <Box 4-1>) played a major role in convincing people that a swap market was acceptable.

<Box 4-1>

World Bank−IBM Swap in 1981

A famous and early example of an FX swap was the one between the World Bank and IBM in August 1981. This helped kick-start the market because the players were two prestigious organizations that received a lot of publicity, which attracted many other end users to the market. This was also the first long-term swap by the World Bank, which is now one of the biggest users of the related market.

This is a simplified description of the famous swap. The two parties had considerably different objectives. IBM had started a global funding program years

earlier, raising money in German marks and Swiss francs (CHF). The money was remitted back to the US for general funding, creating foreign exchange exposure because IBM had to convert USD into the two European currencies regularly to make the coupon payments. Over the years, the greenback significantly rose in value, creating a gain for IBM. The company sought to lock in the gains and remove any future exposure.

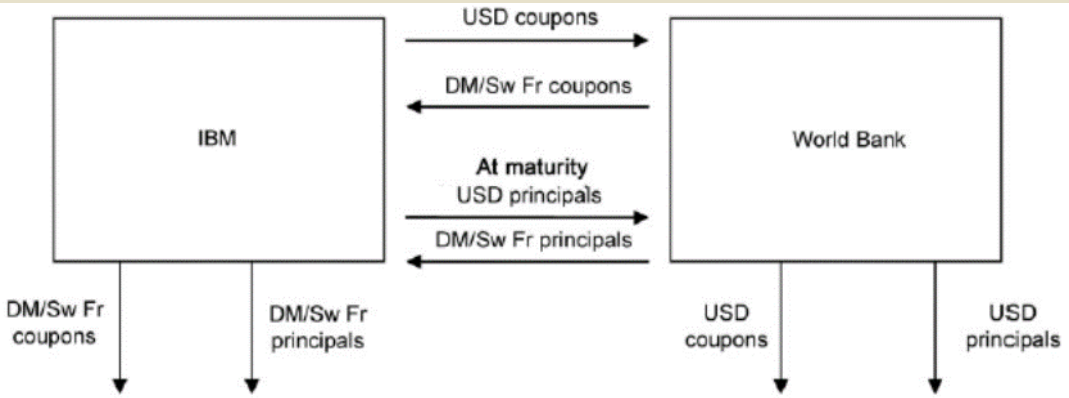
The World Bank had a policy of raising money in hard currency, namely in the two European currencies and JPN. As a prolific borrower, the bank by 1981 found that its cost of funds in these currencies was rising simply through an excess supply of bank commercial papers. Its objective, as always, was to raise cheap funds.

Salomon Brothers suggested the following transactions:

(a) The bank could still raise USD at relatively cheap rates, and so it was advised to issue two Eurodollar bonds. One matched the principal and maturity of IBM's German mark-denominated liabilities equivalent to USD 210 million, and the other matched IBM's CHF liabilities equivalent to USD 80 million. Each bond had a short first period to enable the timing of all future cashflows to match.

(b) Because of a two-week settlement period, the bank had to sign an FX forward contract to sell the total bond proceeds of USD 290 million and buy the equivalent in the German and Swiss currencies.

(c) IBM and WB agreed to a two-stage swap



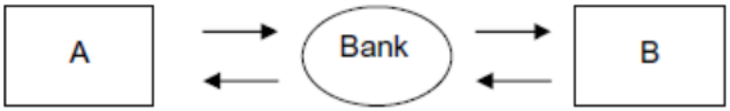
in which IBM converted its liabilities in the two European currencies into USD, and the bank effectively raised hard currency at a cheap rate. Both IBM and the

World Bank achieved their objectives.

Source: Flavell (2010), pp. 5–6.

(Phase 2)

The second phase that came originally in the early to mid-1980s saw commercial banks start to play an increasing role in providing guarantees.



The counterparties both negotiated directly with the bank, which would structure back-to-back swaps but take the risk usually for an ongoing spread, not an upfront fee. The bank's normal lending departments were responsible for negotiating the transaction and the credit spread. The related documentation grew more standardized and was provided by the bank. This role was often described as acting as an "intermediary," taking on credit but not market risk.

The role of an intermediary may also be encouraged by external legislation. In Britain, for example, if two non-banking counterparties enter a swap, their cashflows are subject to a withholding tax. This is not true if one counterparty is a bank in a market's earliest days, so it is very much an arranged market whereby two sides perform a swap

(Phase 3)

The concept of a market-making bank was originally developed in the mid to late 1980s, when a bank provided swap quotations on request. This meant that they were simultaneously dealing with a range of counterparties and entering a variety of non-matching swaps. With higher market risk, such banks required considerably more capital, pricing and risk management systems, and highly standardized documentation. The swap market became dominated by large commercial banks that saw it as a volume-based commoditized business.

These banks would typically offset market risk by hedging in another market, usually the equivalent government bond market as this was the most liquid. So banks with an underlying activity in this market were likely at a competitive advantage. Domestic banks usually have close links with the local government bond market, and hence are frequently dominant in the domestic swap market. Probably the only market where this is not the case is the USD market, which is so large that foreign banks can also be highly active and competitive in it.

Banks frequently and misleadingly talk about "trading" swaps, as if a swap were equivalent to a spot FX transaction settled and forgotten about within two days. A swap is a transaction that creates long-term credit exposure for a bank. The exposure is likely to remain on the bank's books long after the swap "trader" has received a bonus and left the bank. From this perspective, swaps fit much more comfortably within the traditional lending departments with all the concomitant credit-controlling processes, not within a treasury, which is typically far laxer about credit.

This link with the bond market shows how a bank can play different roles in different markets. For example, Nordea Bank of Finland would be a market maker for currencies of Scandinavia and possibly several Northern European countries. On the other hand, it would act as an intermediary in other currencies. For example, if a customer wanted to do a South African rand (ZAR) swap, he or she would enter it taking on the credit risk but immediately laying off the market risk with a ZAR market-making bank.

Swap brokers still play an important role in this market. Their traditional function is to identify the cheapest but suitable counterparty for a client, usually on the initial basis of anonymity. This activity creates liquidity and uniformity of pricing for the overall benefit of market participants. As markets for most liquid currencies continue to grow, however, a broker's efficiency is less valued and their fees increasingly fall to a fraction of a basis point. Brokers are thus forced to develop more electronic skills to survive.

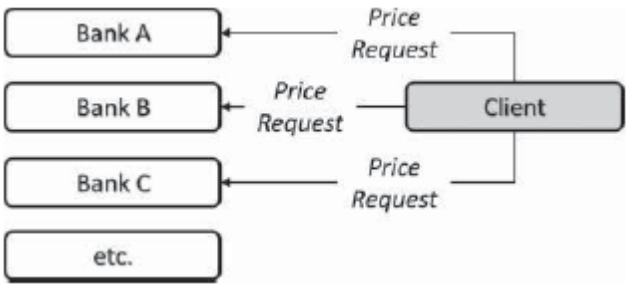
B. Basic Structures of Swap Markets for Major Currencies

Market structure is crucial in practice because it defines how clients interact with the trading desk and how the latter accesses liquidity to hedge client risk.

In certain financial markets, all participants access a centralized market or exchange anonymously on the same terms. The FX derivatives market, however, is an over-the-counter (OTC) market with no centralized exchange and a clear distinction between banks and their clients.

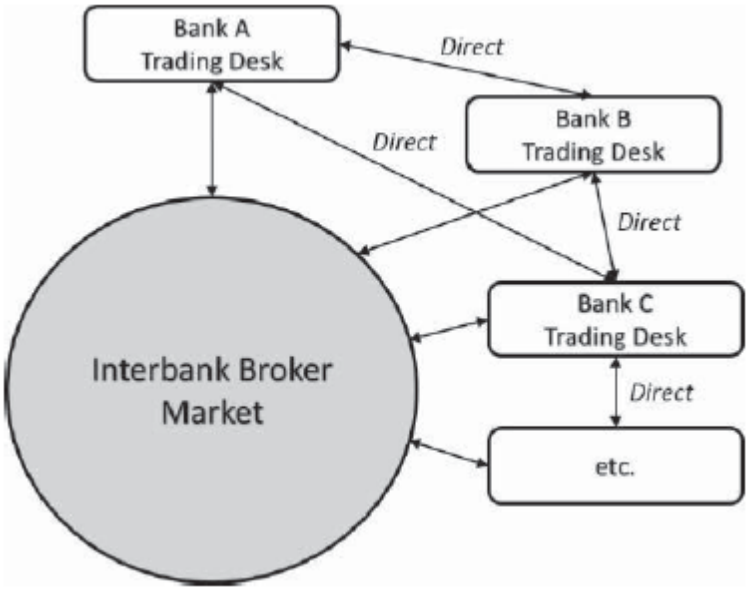
Fundamentally, the trading desks at banks for FX derivatives conduct transactions with clients, aggregate and offset the risk where possible, and close out unwanted residual risk. More specifically, clients come to such desks for prices, often through a sales desk at the bank. Usually the client simultaneously submits the same price request to multiple banks and chooses the one with the best price as shown in <Figure 4-3>. Traders usually make two-way prices for clients because of uncertainty over whether a client is a buyer or a seller of a given contract.

<Figure 4-3> Client Requesting Prices from Banks



Bank trading desks conduct transactions with each other either through the interbank broker or the direct market (a price request directly between a trader at one bank and a corresponding trader at another). The majority of bank-to-bank transactions occur in the interbank broker market. This structure is shown in <Figure 4-4>.

<Figure 4-4> Interactions in Interbank Broker Market



FX derivatives traders at banks can contact each other directly to request prices on swap contracts. The process is straightforward. Trader A calls Bank B via a recorded messaging system and requests a price for a swap contract. Trader B picks up the request (because he or she is trading that currency pair) and sets a price for the contract in implied volatility terms. Trader A then has a short time (approximately 20 seconds or less) to deal (hence crossing Trader B's spread) or pass on the price. After an implied volatility price is agreed on, the traders agree that the market data (spot, forward, and deposit rates) and option premium between themselves and the deal must be input into both risk management systems.

The interbank broker market is a crucial part of the structure of the FX derivatives market since this is where the vast majority of bank-to-bank FX derivatives transactions occur. Communication between broker and trader has traditionally been done by recorded messages over fixed telephone lines or text messaging systems. Communication is moving away from free-form text messaging toward standardized electronic messaging.

As explained in the evolution of the swap market, many of these markets for major currencies have dealers, who are profit-motivated traders who allow other traders to trade when they want to. The liquidity service that they sell—immediacy—is valuable to

impatient traders. Dealers profit when they buy from impatient sellers at low prices and sell to impatient buyers at high prices. The difference in price compensates them for providing immediacy.

Dealers are often known by other names. At futures exchanges, they are often called scalpers, day traders, locals, or market makers. At many stock and options exchanges, they are known as specialists or market makers. In addition to offering liquidity to other traders, many dealers speculate. They can sometimes predict price changes by inferring why traders demand to trade. Many dealers are also brokers.

Because dealing can be quite risky, successful dealers tend to be traders who tolerate risk well. They generally do not enjoy taking on risk, however. The risks of dealing are serious and scary, with many dealers assuming risk that resulted in their bankruptcy. Dealers constantly think of the risks to bear and how to avoid them. Since assuming risk is unpleasant, dealers demand appropriate compensation when forced to take on large risk.

C. FX and Currency Swap Markets in Korea

The trading mechanism in the interbank FX swap market is almost the same as forward-exchange transactions in basic terms such as participants, transaction units, and trading hours. The price is quoted as a swap point (forward exchange rate minus spot exchange rate), similar to FX futures.

The maturities of FX swaps traded on the Korean interbank market mostly standardized: overnight (O/N), tomorrow next (T/N), spot next (S/N), week, month, and year. Non-standardized term swaps are also traded. Short-term FX swaps such as O/N are actively traded. FX swap transactions on the retail market can be freely determined by a contract between the parties.

FX swap volume by domestic foreign exchange banks (on a daily average basis) increased from USD 179.2 billion in 2010 to USD 194 billion in the third quarter of 2015. This was mainly due to active bank transactions to adjust foreign exchange positions, financing temporary shortages in select currencies, and hedging foreign exchange risk.

These needs usually came from non-deliverable forward transactions with non-residents or FX transactions with non-financial companies. Transactions through foreign exchange brokerages rose from USD 101.9 billion in 2010 to USD 108.3 billion in the third quarter of 2015, accounting for 55.8% of all FX swap transactions (USD 194 billion).

<Table 4-1> Transaction Volumes of FX and Currency Swaps

(Unit: Billion USD)

	2010	2011	2012	2013	2014	2015.Q1	2015.Q2	2015.Q3
FX swap	17.92	19.23	19.81	19.54	19.01	19.17	19.45	19.40
Currency Swap	0.63	0.75	0.7	0.71	0.83	0.80	0.75	0.83
Total FX	41.89	46.83	45.38	45.98	44.84	47.99	49.72	49.38

Note: Daily transaction volume average
Source: Bank of Korea (2016).

Currency swaps can be done through direct transactions between parties or indirect ones through brokerages. In Korea, currency swap maturity varies from 3 months to 20 years, but those of the most common swaps are between one and five years. The minimum trading unit is USD 10 million. The swap is usually between KRW at a fixed rate and a foreign currency at a floating rate. For the latter rate, the six-month LIBOR is most commonly used.

Just like the market for interest rate swaps, that for currency swaps is divided into the interbank and customer markets. Market makers and their clients such as credit card and insurance companies have a contract prior to trading to set the limits for swap trading. A transaction is made when a request from a client is accepted by a market-making (swap) bank. A swap bank uses currency swaps to adjust its positions through offsetting transactions or for speculative purposes.

After Korea's first FX swap was brokered in September 1999, the currency swap market saw steady growth to reach a record high in 2008 of KRW 44.8 trillion won in monthly average trading. Trading fell afterwards, however, averaging KRW 20.8 trillion per month in the first half of 2016. As for interest rate swaps, banks account for most of the trading in currency swaps. Foreign bank branches play the role of market maker, as

they can supply long-term funds in foreign currency from their headquarters.

On their motivations for using currency swaps, banks use them to adjust their swap positions resulting from transactions with clients such as life insurance and credit card companies and public corporations. Life insurers with longer-term insurance contracts have high demand for long-term bond investment, which is difficult for the domestic bond market to satisfy. So, the insurers invest in long-term, foreign currency-denominated bonds with maturities of around 10 years and hedge the related risks in foreign exchange and interest rate using currency swaps. Meanwhile, foreign investors use currency swaps to invest in Korean bonds when the spread between Korean bond yields and currency swap rates widens due to financial market instability or similar factors.

<Table 4-2> Currency Swap Trading[1)] by Institution[2)]

(Unit: Billion KRW, %)

Banks	Brokerages	Insurers	Trusts	Others	Total
180,672	46,279	21,452	1,451	0	249,854
(72.3)	(18.5)	(8.6)	(0.6)	(0.0)	(100.0)

1) Based on total trading volume in first half of 2016
2) Figures in parentheses represent shares of total.
3) Bank trusts and asset management companies
Source: Financial Supervisory Service

3. Policy Implications and Remaining Tasks

A. FX vs. Currency Swaps

As explained in this paper, the foreign exchange market has a variety of swaps, with the FX and currency varieties being similar in certain ways but different in features and functions. Cambodia needs to select which one on which to focus. A variety of swaps in the market is good for buyers. Markets, however, need to be liquid to provide functions to participants and if there are too many markets, liquidity provision can be insufficient. One recommended strategy is for Cambodia to focus on developing the FX swap market first and that for currency swaps later.

The trading industry has buy and sell sides. The buy side consists of traders who buy exchange services, the most important of which is liquidity. Liquidity is the ability to trade when desired. Traders are on the sell side and sell liquidity to the buy side. A swap market also needs liquidity, and market makers are among liquidity providers.

B. Liquidity Provision and Market Makers

Market makers are dealers who allow impatient customers to trade at bid-and-ask prices quoted by market makers. Market makers often trade frequently, trying to buy after they sell and vice versa. They avoid large inventory positions because they generally are unaware of the fundamental values of the instruments that they trade well. Large positions expose them to losses if the market moves against them. Market makers simply try to discover the prices that produce balanced flows of two-sided orders.

Market makers primarily supply liquidity in the form of immediacy, usually quoting narrow markets but only for small sizes. If asked to trade large sizes, they will quote wide markets to protect against losses to well-informed traders.

Market makers need capital to finance their inventories. The capital available to them thus limits their ability to offer liquidity. Because market making incurs high risk, investors generally do not invest in market-making operations. Investors are less

concerned about inventory risk, most of which is diversifiable, and more about trader incentives. Financiers know that most do not work as hard when working for others than working for themselves. Since market making requires continuous attention to avoid significant losses, incentives are crucial. Market makers thus cannot easily raise capital by borrowing or issuing equity.

At the moment, two Cambodian banks have expressed interest in developing an FX swap market for commercial purposes. One of them normally has excess KHR-based funding as it holds KHR-denominated accounts of state-owned companies and civil servants. This would allow the bank to offer FX and currency swaps without opening an FX net position. The bank is one of the very few in Cambodia in a unique position to do so, thus it could be a good market maker.

The other bank, however, has no excess KHR and in offering the FX swap, it adds related risk to its balance sheet. It seeks to reduce part of its open position by engaging in the opposite trade through the LPCO, but maturity gap risk remains as the LPCO is short term while its currency swap is often longer. As it takes on the risk its balance sheet, the bank can offer a limited amount of FX and currency swaps. As it uses LPCO transactions to fund its FX swap products, this bank uses LPCO pricing as a benchmark to price its product. In offering LPCOs, the NBC will not discriminate between market makers and other commercial banks; all participants are treated equal in LPCO auctions.

C. Developing Infrastructure to Support Swap Markets

Infrastructure is crucial to develop and support the FX swap market. The NBC has provided the LPCO and FX trading platforms, and will also use both platforms to allow FX forwards to be listed, traded, and settled by buyers and sellers. With FX forwards, banks can then structure currency swap contracts.

The NBC also has tentative plans for building soft infrastructure by raising the permissible net open positions for foreign currency for banks. The limit of 20% of net worth often provokes criticism as a constraint on banks. The NBC will also issue a

standardized agreement on an FX swap usable by banks in bilateral transactions with other banks.

LPCO restructuring is another alternative. The exchange of notional principal has a large impact on the foreign exchange rate as the NBC adds new KHR-denominated liquidity into the financial system without any sterilization. Like a non-deliverable swap, such restructuring will minimize the impact on the foreign exchange rate and allow the NBC to offer more and lower its cost.

D. Other Policy Support for Swap Market Development

Previous experience in building swap markets shows that many problems are difficult to solve. For example, swap dealers must raise their capacity to price the swaps, but are not willing to invest money to do so if swap products see weak demand. On the other hand, customers will shun buying from dealers with poor ability to price swaps.

This obstacle suggests a “chicken or egg” problem in the formation of a well-functioning swap market. This dilemma arises because of the externality of swap transactions. A swap transaction can benefit other customers by enhancing the dealer’s ability to price swaps. Another externality in a swap market is network externality, which arises when consumer utility in a market depends on consumption of the same service by other customers. Customers seem to prefer a variety of swap products, and so the more kinds of swaps on the market, the higher their value.

With positive externalities present, economic theory says the government could interfere with the market to increase the number of such externalities. The Cambodian government and the NBC have taken policy actions to support the FX swap market, with Phnom Penh announcing its intention to issue bonds. In this case, market participants can make a yield curve, which is crucial in pricing swap products. The NBC is cooperating with the Security Exchange Commission of Cambodia to encourage derivatives brokers to offer swap products. Government policy to promote deposits and savings denominated in KHR will provide funding for investment based in the domestic currency.

Appendix

II. A. Requirements & Rights of Licensed and Authorized Money Changer Summarized from the Prakas on Money Changer License or Authorization (No. B-9-09-230 Prokor)

Licensed Money Changer			
No	**Requirements**	No	**Rights**
1	Minimum Capital KHR 80.000.000 deposit in capital account opened at NBC	1	Bidding at NBC
2	Application Fee KHR 100.000	2	Training at NBC
3	Annual Fee KHR 1.200.000		
4	Validation 3 years start from issued date		

Authorized Money Changer			
No	**Requirements**	No	**Rights**
1	No Capital Requirement	1	N/A
2	Application Fee KHR 100.000	2	N/A
3	Annual Fee KHR 200.000		
4	Validation 1 year start from issued date		

Source: NBC

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