CAMBODIAN DOLLARIZATION

ITS POLICY IMPLICATIONS FOR LDCs' FINANCIAL DEVELOPMENT

Edited by
Hidenobu Okuda and Serey Chea

Cambodian Dollarization

This book is the first study to provide a comprehensive picture of the reality and structure of dollarization in Cambodia, which has been achieving rapid economic and financial development since the end of 1998, when full peace reigned over the kingdom. It uses the micro-level data collected through nationwide surveys conducted jointly by the National Bank of Cambodia and JICA Ogata Sadako Research Institute in 2014 and 2016.

By applying econometric analysis to the collected data, the book analyses in detail the structures and mechanisms of dollarization in households, companies, and financial institutions. It also provides detailed information on the historical development of Cambodian dollarization, international comparisons with various cases of dollarization in countries around the world, and the impact of NBC's issuance of CBDC (particularly Bakong) on the use of local and foreign currencies. The Cambodian case shows that financial development of low- and middle-income countries is promoted mutually by dollarization and that policies to separate the two are necessary to curb dollarization.

This book will be of interest to students, researchers, and policy-makers concerned with dollarization and economics in Southeast Asia.

Hidenobu Okuda is a professor in the School of Economics at Teikyo University and a visiting scholar at the JICA Ogata Research Institute.

Serey Chea is the governor at the National Bank of Cambodia.

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Foreword

Cambodia has made remarkable progress through various stages of development, and over the two decades prior to the COVID-19 pandemic, the economy grew at an average rate of 8%, making it one of the fastest-growing economies in the world. Nevertheless, Cambodia remains one of the highest dollarized economies, limiting the effectiveness of monetary policy implementation, which plays a crucial role in regulating and promoting the economy as well as mitigating shocks and enhancing the resilience of the economy.

In light of the importance of tackling dollarization, the Royal Government of Cambodia and the National Bank of Cambodia (NBC) have introduced a series of market-oriented measures to promote the local currency, Khmer Riel (KHR), since early 2000s. The policy to stabilize the value of KHR, along with peace and political stability, has lifted confidence and trust in the KHR. As a result, the demand for KHR has gradually expanded and the level of dollarization has been prevented from increasing further compared with the trend seen in the 1990s. The macroeconomic stability, coupled with solid policy commitment, has created a strong foundation to regain public confidence in local currency in the economy, especially an increasing role of KHR for large-value payments and savings.

Despite recent progress in the increasing use of KHR, more efforts are needed. In order to achieve this objective, more active and consistent participation and collaboration are required from all stakeholders in both the public and private sectors. The understanding of the importance of KHR among citizens should also be enhanced in order to deal with the mindset of using US dollars that has been well-rooted. It is worth highlighting that since 2013, with support from the Japan International Cooperation Agency (JICA), the NBC and JICA Research Institute have conducted comprehensive studies on dollarization in Cambodia, including the progress and challenges in terms of local currency usage among households, firms, and financial institutions, to elicit effective policies for achieving the long-term goals of de-dollarization. These studies have contributed to improving the understanding and policy formulation to promote the use of KHR.

I am pleased to acknowledge that thanks to the efforts of our joint research over ten years, this book is now available. I would like to take this opportunity to express my gratitude to JICA and the authors of this book for their continued support, tireless efforts, and important contributions. I am confident that the book will provide comprehensive insight to enrich the research on this subject and input for the future direction of promoting the national currency, which symbolizes national identity, economic sovereignty, and the country's dignity.

Phnom Penh, 27 January 2023
Chanto Chea
The then Governor
National Bank of Cambodia

Acknowledgments

This book is one of the outputs of the Empirical Study on Promoting the Use of the National Currency in Cambodia, jointly conducted by the National Bank of Cambodia (NBC) and the Japan International Cooperation Agency (JICA).

This publication project has been supported by many people. First, we would like to express our gratitude to the former Deputy Governor of the National Bank of Cambodia, Her Excellency Dr. Neav Chanthana, and former Directors of JICA Ogata Research Institute Dr. Hiroshi Kato, Dr. Naohiro Kitano, and Dr. Izumi Ohno. It was essential for the success of this joint research that we received timely and accurate advice regarding the orientation of the research and the selection of the research topic. In addition, public seminars and forums for exchanging opinions with interested parties from various fields were extremely effective in enhancing the results of our research.

In the two nationwide field surveys of NBC-JICA joint research conducted in Cambodia, we received a great deal of help from the staff of NBC and JICA Cambodia office, and our research partner, Business Development Link (Cambodia) Co. Ltd. (BDLINK). We have received useful suggestions and information from relevant institutions and their staff, including the Association of Banks in Cambodia, Cambodia Microfinance Association, the IMF representative office, and the ASEAN+3 Macroeconomic Research Office (AMRO). Although we cannot name each individual, we would like to thank all the associates. Among all these, the managing director of BDLINK, Dr. Sandra D. Amico, provided us with useful advice at each stage, including when designing the survey architecture, implementing the field survey, and compiling the survey data. The meticulous planning and practical problem-solving skills of Mr. Ken Odajima, the leader of the JICA research team, were critical to the success of this project.

The results of this survey were presented in the Public Dissemination Seminar "Survey Result on the Usage of Riel in Cambodia," held on October 20, 2016, and the Dissemination Seminar "The Second Round Survey Result on the Usage of Riel in Cambodia," held on March 19, 2019. We would like to thank the financial institutions, government ministries and agencies,

research institutes, and domestic and foreign researchers who participated in these seminars and exchanged opinions. Research papers related to chapters of this book were presented at academic associations, such as the Japan Society of Monetary Economic, the Japan Society for International Development, the Japan Association for Asian Studies, the Korea Money and Finance Association, the Japan Society for Monetary Economics, the Economic Society of Singapore, and the East Asian Economics Association. In these seminars, useful comments were received from Prof. Akira Kosaka, Prof. Hal Hill, Prof. Takatoshi Ito, Prof. Shujiro Urata, Prof. Euston Quah, and Prof. Fumiharu Mieno.

To aid in the publication of this book, in addition to the members of the NBC-JICA joint research, new contributors participated to provide a more comprehensive research perspective and to incorporate changes after the joint research. We are very grateful to all contributors for providing highly qualified examinations of their respective research agendas and skillfully responding to our repeated requests for manuscript revisions.

Finally, we would like to extend our gratitude to Ms. Miyama from JICA. Throughout this book project, she was in charge of communication and coordination with publishers and authors. She efficiently handled the paperwork, which required much time and effort. Publication would not have been possible without her impressive support.

Serey Chea
Hidenobu Okuda

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Editors and Contributors

Editors

Hidenobu Okuda is a professor of Teikyo University, an emeritus professor of Hitotsubashi University, and a visiting scholar of JICA Ogata Research Institute. His research focus is financial development in emerging market economies with a focus on Asian countries. He received his Ph.D. in economics from the University of Minnesota in 1989. He was an economist at the Export–Import Bank of Japan (1989–1991) and a lecturer, associate professor, and professor of Hitotsubashi University (1991–2019). He was a member of the Ministry of Finance, Council on Customs, Tariff, Foreign Exchange, and Other Transactions (Deputy Group Chairman) (2010–2019).

Serey Chea is the governor of the National Bank of Cambodia. She is passionate about financial inclusion and women's economic empowerment. Achievements under her leadership include the establishment of Credit Bureau Cambodia in 2012, which propelled Cambodia's World Bank Ease of Access to Finance rating to number 7 worldwide in 2017, the introduction of Bakong, a national backbone payment system using DLT, enabling interoperability among all financial service providers, thus making financial services more accessible and affordable, and the introduction of financial literacy into the general education program. Serey holds a Ph.D. in economics and is a member of the Young Global Leaders of the World Economic Forum.

Contributors

Daiju Aiba is currently a resident expert at National Bank of Cambodia (NBC), under the JICA-NBC technical cooperation project, and a visiting scholar at JICA Ogata Research Institute (JICA-ORI). He was previously an assistant professor in the Faculty of Commerce of Waseda University and a reaserch fellow at JICA-ORI. He obtained Ph.D. in economics from

Hitotsubashi University in 2017. Since he began his career at the JICA-ORI he has been engaged in research on the field of development economics and financial markets for many years. In particular, he has published research on dollarization and financial inclusion in Cambodia. He has published in distinguished academic journals, such as the *Journal of Asian Economics* and *Singapore Economic Review*.

Sovanney Chey joined the National Bank of Cambodia (NBC) in 2008, working in the Economic Research and International Cooperation Department. She is currently a Division Chief of Monetary Strategy Division of the department, mainly in charge of the analyses of inflation, exchange rate, interest rates, and liquidity conditions, as well as inflation and liquidity forecasting. Sovanney is responsible for producing liquidity report and participating in producing reports on recent macroeconomic and financial development in Cambodia, reports for investment committees, monetary policy reports, and semiannual and annual reports. Prior to her current division, she was a deputy division chief of Economic Analysis Division with a focus on real sector analysis, in particular inflation and the three main sectors of production-side GDP, namely agriculture, industry, and services. From August 2019 to August 2020, she joined the Secondment Program in the ASEAN+3 Macroeconomic Research Office (AMRO), as a research associate with the main tasks on monetary and financial sector analysis, research, and assessment of risks and vulnerabilities. She worked closely with the Country Surveillance Teams of Cambodia, Vietnam, and Brunei Darussalam. In March and April 2013, she was an intern research associate at the Asian Development Bank Institute in Tokyo, undertaking data collection for the professionals to produce working papers. Prior to joining the NBC, she worked for the General Department of the National Treasury for more than a year as a public accountant, working on budget expenditure and producing balance sheets. Other accounting experiences included as a trainee in RM Asia Co. Ltd. and ACLEDA Bank as an undergraduate and after graduating. Sovanney holds a master's degree in public policy from the University of Tokyo, Japan, under the Japan–IMF Scholarship Program for Asia (JISPA) and another master's degree in finance from the National University of Management, Cambodia. Her research interests include monetary policy, dollarization, and credit growth.

Kazue Demachi is an associate professor at the Institute of Global Studies, Tokyo University of Foreign Studies. As a researcher, she has focused on the macroeconomy of natural resource-rich countries in Sub-Saharan Africa and Southeast Asia. After earning her doctoral degree and working at Kobe University, she started working at Tokyo University of Foreign Studies in 2016. She has belonged to the African Studies Center since 2017 and has been involved in international workshops and seminars organized by the center, held in Tokyo, South Africa, and Rwanda. Her primary research

interests relate to the stability of financial systems, the emergence of various financial services, and the sovereign external debts of those countries. Her major research field in Africa was Ghana before the pandemic, and she was planning to resume work there in 2023. On the educational side, she has been teaching international economics at the School of International and Area Studies at the Tokyo University of Foreign Studies since 2016. Since 2021, she has also taught in the Joint Doctoral Program for Sustainability Research run by the three universities in West Tokyo, Tokyo University of Foreign Studies, Tokyo University of Agriculture and Technology, and the University of Electro-Communications. Her recent works include "Economy and Development: Africa in the Market" (Chapter 7) in *Introduction to African Area Studies,* edited by Takuto Sakamoto and Mitsugi Endo (Showado, in Japanese), and "Natural Resources and Energy in the Asian Economies" (Chapter 15) in *Contemporary Asia*, edited by Shiro Sato and Shinya Ishizaka (Akashi shoten, in Japanese). The list of other publications is available and updated on her university website. Her recent research is related to industrial shifts in African economies, sovereign debt, and the influence of the international financial market on developing countries. The publications as working papers are available at the website of the African Studies Center at the Tokyo University of Foreign Studies.

Vouthy Khou joined the National Bank of Cambodia (NBC) in 2006 as a junior economist. He was appointed as the deputy director general of central banking in 2017, in addition to his position as the director of economic research and international cooperation (ERIC), which he has held since 2013. His main responsibilities are supervision of the following areas: macroeconomic surveillance; monetary policy formulation; financial stability risks monitoring; financial and monetary statistics; external and internal communication; and international relations. Dr. Khou earned his Ph.D. in economics (money, finance, and international economics) from the University Lumière Lyon 2, France. He has conducted much research and many surveys, in particular related to dollarization.

Koji Kubo is a professor in the Faculty of International Social Sciences, Gakushuin University, Japan. Before moving to his current position, he was a research fellow at the Institute of Developing Economies, Japan External Trade Organization (IDE-JETRO) for 20 years, where he conducted extensive fieldwork in various regions of mainland Southeast Asia. He received his doctoral degree from the Osaka School of International Public Policies, Osaka University. His research focuses on the evolution of informal as well as formal economic institutions in Southeast Asian countries. He wrote the monograph *Myanmar's Foreign Exchange Market: Controls, Reforms, and Informal Market* (2018).

Sok Heng Lay holds a Ph.D. in Economics from the University of Adelaide (Australia) and a master of arts in international development program (economics) from the International University of Japan. His research interests include financial inclusion, financial development, financial technology (fin-tech), and international economics. He has extensive research experience and his papers have been accepted for publication in several international peer-reviewed journals; he has also won several international essay competitions, including those run by the Japan Foreign Trade Council and the Toronto Centre. In addition, he is a reviewer for the *Journal of Social Sciences and Economics*. Sok Heng is currently a deputy director of the Economic Research and International Cooperation Department and a head of the Deposit Protection and Bank Resolution Unit of the National Bank of Cambodia. As a researcher, he has led research project jointly organized by the National Bank of Cambodia and the Bank of Korea (BOK), the Japan International Cooperation Agency (JICA), and the United Nations Development Programme (UNDP) Cambodia, in two of which he has been a project coordinator. He also led research work on the feasibility study of the deposit protection scheme and drafted regulations for the setup of deposit projection agency for Cambodia. In addition, he is member of the secretariat for the Monetary and Financial Stability Committee of the National Bank of Cambodia. He also has academic experience in Cambodia, Japan, and Australia.

Ken Odajima received his master's degree in public policy studies from the University of Chicago. His fields of research are development policy, international cooperation, financial markets and poverty reduction. After a long career at the Overseas Economic Cooperation Fund (OECF), Japan and the Japan Bank for International Cooperation (JBIC), he joined the JICA Ogata Sadako Research Institute for Peace and Development as an executive senior research fellow. He was also an associate professor in the Graduate School of Economics, Hitotsubashi University and a part-time lecturer in the Department of Economics, Saitama University. He is currently working at Kafco Japan Investment Co. Ltd.

Yasuhisa Ojima has been an IMF resident representative for Cambodia since September 2019, and was an IMF resident representative for Myanmar, a senior economist in the Asia and Pacific Department and a mission chief for Tonga. In the IMF, Mr. Ojima has worked in various countries (including Mongolia, Myanmar, Nepal, and Tonga) with a wide range of operations: an Article IV consultation, an IMF-supported program, post-program monitoring, and ex-post assessment. He has also worked on financial stability issues, including by participating in the Financial Sector Assessment Program and Technical Assistance mission. He has diverse research interests and has published actively in several areas, including inflation dynamics, financial deepening, macro-prudential policy, and monetary

policy frameworks. Prior to joining the IMF, he was a director in the Credit Risk Analysis Division of the Japan International Cooperation Agency (JICA) and a resident representative for the Japan Bank for International Cooperation (JBIC) in Vietnam. He has published several textbooks and articles in the field of international and development economics and taught at Waseda University in Tokyo. Mr. Ojima holds degrees from Yale University and Keio University, both in economics.

Sarat Ouk currently serves as director of the Payment System Department, National Bank of Cambodia. His main responsibilities include formulating payment system policy, strengthening regulatory and oversight frameworks, and enhancing cooperation among all stakeholders. Mr. Sarat Ouk also engages in several financial sector initiatives: financial sector development strategy, financial inclusion, financial stability, and financial integration. Before moving to the Payment System Department, he had a career as a bank supervisor. He joined the central bank in 2002.

Vichet Sam holds a Ph.D. in economics of education and labor from Grenoble Alpes University and a research master's in money, finance and governance from Lumière Lyon 2 University in France. He has more than nine years' experience as a researcher and consultant in various research projects, funded by the World Bank, United Nations Development Programme (UNDP), Japan Social Development Fund (JSDF), Japan International Cooperation Agency (JICA), and the Bank of Korea (BOK). Currently, he is a senior economist at the National Bank of Cambodia (NBC), which he joined at the end of 2018. Since joining the bank, he has worked as a researcher in joint-research projects with JICA on the "Empirical Study on the Promotion of Home Currency", and with BOK on "Interbank Market Development in Cambodia." Within these projects, he published a book chapter and several research articles. He also published articles in several international journals and produced a number of working papers on various topics, including drivers of inflation in Cambodia, SMEs development and economic resiliency, financial inclusion, and education–job mismatches. He is a reviewer for three international academic journals based in the United Kingdom and Australia in the fields of financial economics, and economics of education and labor. At NBC, he is also a staff member in the Financial Stability Unit, which is in charge of updating recent economic and financial developments and analyzing the outlook and risks to Cambodian financial and banking stability on a regular basis. With a strong belief that quality education can improve the future of a country, he has been teaching economics part time at some universities in Phnom Penh to share his knowledge and experience with Cambodia's young people. Prior to his career at NBC, he was an assistant project manager, national projects consultant, lecturer-researcher, and coordinator of a French bachelor's program in economics and management at the Royal University of Law and Economics.

Sovannroeun Samreth is currently an associate professor in the Faculty of Liberal Arts and the Graduate School of Humanities and Social Sciences at Saitama University, Japan. He earned his Ph.D. in economics from the Graduate School of Economics at Kyoto University, Japan in 2009. He started his career as a research fellow at the Graduate School of Economics at Osaka University, Japan and then worked as a postdoctoral research fellow at the Graduate School of Economics at Kyoto University, Japan under the program of the Japan Society for the Promotion of Science (JSPS). In 2011, he was appointed an assistant professor in the Faculty of Liberal Arts at Saitama University and was promoted to associate professor in the Faculty of Liberal Arts and the Graduate School of Humanities and Social Sciences at Saitama University in 2013. His main research focus is on economic issues in developing countries, such as dollarization, corruption, microfinance, and the financial diaries of poor households.

Introduction

Serey Chea and Hidenobu Okuda

Similar to its neighboring ASEAN countries, the Cambodian economy has experienced favorable macroeconomic performance featuring an average annual growth rate of about 6% in real GDP and a single-digit rate of inflation in most years since the 2000s, with the exception of the global financial crisis and COVID-19 outbreaks, thanks to a series of consistent reforms toward a market-orientated economy and policies facilitating capital inflows. The biggest feature that distinguishes the Cambodian economy from those of other neighboring countries is what is known as "dollarization," meaning that foreign currency is widely used by residents in the economy (Unteroberdoerster 2004). In recent decades, the level of dollarization has increased constantly, and the ratio of foreign currency bank deposits to total bank deposits now exceeds 90%, while the country's macroeconomic environment has been favorable and stable (Unteroberdoerster 2014).

It has been well known that the available data on bank deposits and loans indicate a high degree of financial dollarization in Cambodia. However, dollarization in the economic activities of the non-financial sector of Cambodia has been investigated only sparingly. A joint project of the National Bank of Cambodia (NBC), the supervisory authority for financial institutions and related transactions, and the Japan International Cooperation Agency (JICA) was commenced in 2014 to collect nationwide data for households and firms as well as financial institutions. The studies under this project have successfully revealed the comprehensive nature of dollarization in Cambodia. According to these studies, dollarization in Cambodia has developed alongside the development of the financial sector.

The purpose of this book is to analyze the microdata collected by the joint survey of NBC and JICA to clarify the structure of Cambodia's dollarization and the actual situation of dollarization, which was previously understood only from the perspective of the financial sector. This book explains Cambodian dollarization from this multifaceted perspective. It provides a basic analysis of the logic of Cambodia's economic system and will assist in the formulation of policies for economic development.

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I.1 The Dollarization of the Cambodian Economy[1]

The phenomenon whereby foreign currencies such as the US dollar are widely used domestically as money instead of a country's own currency is called "dollarization." The dollarization of the Cambodian economy began with the almost complete destruction of the country's monetary and financial system by the Khmer Rouge regime (1975–1979), which aimed to abolish the monetary economy. The policies of the Khmer Rouge were intended not only to abolish financial institutions and currency, but to be more thorough, including the killing of financial institution staff with specialized financial knowledge. The current monetary and financial system in Cambodia was formed spontaneously after the collapse of the Khmer Rouge regime, when domestic financial regulations were inadequate and regulations on foreign currency transactions and international capital transactions were virtually non-functional. In this process, the Cambodian economy became significantly dollarized as cash in dollars began to circulate against the backdrop of huge inflows of aid funds and as the rebuilding of the financial system proceeded on a dollar basis. The ratio of bank deposits in dollars to total deposits exceeded 90% by the end of 2014, and in addition to the widely circulated US dollar, the Thai Baht and Vietnamese Dong are also used in border areas.

In Cambodia, dollarization has generally been evaluated positively as a factor that has contributed to economic stability and the development of the financial system. This is because the circulation of the dollar, a highly credible international currency, is believed to have restored confidence in the monetary economy that was destroyed under the Khmer Rouge regime and contributed greatly to the expansion of domestic financial activities. There is also a widespread opinion that the dollarization of the economy and the availability of free financial transactions have attracted foreign investments in the manufacturing and tourism industries and are also behind the continued inflow of foreign capital.

However, the progress of dollarization potentially reveals vulnerabilities in the financial system. The lack of control over the amount of dollar cash in circulation in the country and the susceptibility of domestic interest rates to fluctuations in foreign dollar interest rates have made it difficult for Cambodia to implement an independent monetary policy. Additionally, the dollarization of financial institutions' activities has almost nullified the central bank's function as the lender of last resort to financial institutions, and maintaining the stability of the entire financial system centering on banks has become difficult. However, there is no guarantee that sufficient dollar inflows will continue to be available to sustain growth. If there is a shortage of dollars to finance future growth, this will hinder the Cambodian economy's development.

I.2 NBC–JICA Joint Research

The Cambodian government announced the "Action Plans and Measures to Promote the Use of the Riel" as one of its policy goals in the 2013 national

elections with the aim of expanding the use of the national currency in the future. Additionally, as noted, NBC and JICA started a joint research project titled "Empirical Study on the Promotion of Home Currency in Cambodia" in 2014.

The status of the survey until now is as follows. First, in March 2013, NBC asked the JICA Cambodia office to support a study on the promotion of the use of the local currency, the Khmer Riel (de-dollarization). In response to this request, a decision was made to conduct joint research after internal discussions within JICA, and a kick-off meeting between NBC and the JICA Research Institute was held in Phnom Penh in June 2013. At this meeting, NBC and JICA-RI discussed and agreed on the research policy, methodology, and role-sharing between the two organizations. Consequently, it was decided to conduct a questionnaire survey of households, enterprises, and financial institutions in all 25 provinces of Cambodia and to proceed with the collection of necessary data from the NBC. For the first questionnaire survey, a local Cambodian survey company (public announcement) was sought and the firm BDLink was selected to conduct the survey work.

The first nationwide survey was conducted between October 2014 and March 2015, following preparatory work that included the design of the questionnaire. The results were reported and presented at seminars and conferences as they were collected. Additionally, as a tentative summary of the first questionnaire survey, the public dissemination seminar "Survey Result on the Usage of Riel in Cambodia" was held on October 20, 2016. The second nationwide survey was conducted, followed by the public dissemination seminar "The Second Round Survey Result on the Usage of Riel in Cambodia," held on March 19, 2019.

The policy reports presented at these public seminars, which became the starting point for the core chapters of this book, have at least three significant aspects. The first is that the questionnaire surveys conducted as joint NBC–JICA research are the first large-scale surveys on dollarization covering the whole of Cambodia. Many studies had already found early on that addressing dollarization was a major challenge for Cambodia's economic development. However, as there had never been a systematic study of the actual situation of dollarization covering all of Cambodia,[2] it could be said that the conventional discussion had been based on speculations, relying on very limited observations or using the experiences of other countries. It can therefore be said that, for the first time, the joint research by NBC–JICA has shifted the debate on dollarization in Cambodia to a reality-based discussion supported by extensive systematically collected data. The data collected from the first and second questionnaire surveys, which are currently under analysis, will be used as a basic database for future discussions on dollarization in Cambodia.

The second contribution is that the joint research discovered many new facts. Until now, the debate about the dollarization of the Cambodian economy has been based on readily available data, such as using the ratio of bank deposits denominated in dollars as an indicator because there has been

no fundamental research on dollarization. However, the first survey revealed that the dollarization of Cambodia is not as simple a phenomenon as previously thought; rather, it has various structures depending on the perspective taken. These survey results are discussed in each chapter of this book, focusing on specific perspectives. The analysis results of these reports suggest that Cambodia's current persistent dollarization is not caused by macroeconomic instability such as high inflation or exchange rate depreciation, but instead the dollar's network externalities are an important factor. These analytical results strongly suggest that Cambodia's financial development and dollarization are two sides of the same coin and that there is a mutually facilitating relationship in which the more financial development advances, the more dollarization advances.

The third significant feature is that specific policy recommendations for expanding the use of the Riel have been proposed on the basis of the actual situation of dollarization in Cambodia, as revealed in the two nationwide surveys. These policy recommendations partly follow the existing policy, which comprises maintaining macroeconomic stability and providing incentives to promote the use of the riel using the price mechanism.[3] However, notably, the government has obliged financial institutions to expand the use of the riel not through a pricing mechanism, but rather through regulatory means. Because Cambodia's dollarization is integrated with the development of the financial system, it has the characteristic that the more the system is developed, the more the dollar is used. Considering this structure, it is difficult to separate dollarization from financial development and stop its progress with policies that use the price mechanism, such as those previously proposed elsewhere. To promote the use of the riel, it is necessary to develop a financial system that is premised on the use of the riel from the beginning. New policy proposals addressing this point will likely become important points of the policy discussion in the future.

I.3 Structure of This Book

This book comprises eight chapters. Chapter 1 explains Cambodian dollarization from a historical and macroeconomic perspective. Chapters 2, 3, 4, and 5 use the micro-level data collected by the NBC-JICA joint research to analyze households, companies, financial institutions, and exchange markets, respectively, in detail. Chapter 6 explains the effect of the CB digital currency Bakong, which has attracted a great deal of attention from overseas in recent years as an important event after the completion of the NBC–JICA joint research, on the expansion of Riel usage. Chapter 7 explains the characteristics of dollarization in Cambodia in comparison with other regions and time periods. Chapter 8 presents policy recommendations for Cambodia's future de-dollarization based on the results of the joint research.

Chapter 1: Development and Structure of Dollarization in Cambodia, by Sovannroeun Samreth (Saitama University), Hidenobu Okuda (Teikyo

University), and Yasuhisa Ojima (IMF), outlines the historical development of dollarization and discusses the mechanism of dollarization in Cambodia by considering the newly discovered microeconomic level data from the period after the Khmer Rouge regime, particularly from the 1990s until 2020, prior to the COVID-19 pandemic. It presents the facts and discusses the driving forces behind the economic growth-related achievements and challenges facing the Cambodian economy. Additionally, this chapter discusses the sustainability of dollarization mainly from a macro perspective to determine whether the process of dollarization is likely to last.

Chapter 2: Dollarization in Households,[4] by Vouthy Khou (NBC), Daiju Aiba (JICA), and Ken Odajima (Kafco Japan Investment Co. Ltd), presents an analysis of the dollarization behavior of households. It systematically analyzes this behavior not only in cities, international tourist areas, and economic centers such as Phnom Penh, Siem Reap, and Battambang—which has been discussed elsewhere previously—but also in a wide range of rural areas. This analysis reveals that the degree of dollarization varies widely depending on the type of products and services on which households are spending, the size of transactions, and so on, in addition to regional differences such as those that exist between urban and rural areas. Although such regional differences have often been discussed previously, this report revealed many facts regarding non-regional aspects as data are being analyzed for the first time, providing valuable material.

Chapter 3: Enterprise and Dollarization,[5] by Sok Heng Lay (NBC) and Daiju Aiba (JICA), provides a comprehensive analysis of dollarization in the business activities of not only large urban enterprises, but also small, midsize, and micro businesses in rural areas. This analysis describes many interesting facts that were discovered, such as that the ratio of dollar-denominated financing within corporations is very high while the ratio of dollar-denominated income within corporations is extremely diverse, and that the ratio of dollar-denominated income within corporations is barely related to dollar-denominated financing. Information on corporate activities has so far been analyzed in a fragmented manner; this analysis has focused on the garment and tourism industries, which are the main industries in Cambodia. The report's content has made it necessary to revise many aspects of the conceptions created by such analyses.

Chapter 4: Dollarization and Financial Institutions,[6] by Sovanney Chey (NBC) and Daiju Aiba (JICA), is a report on the dollarization behavior of financial institutions, using data obtained through a survey on financial institutions and with the cooperation of the NBC. The dollarization of the Cambodian economy has been advanced most on the financial front, as long known. This report also confirms that Cambodian financial institutions are extremely dollarized in terms of funding and are consequently extremely dollarized in terms of asset management. In terms of regions, the relationship between the surplus of funds in urban areas and the shortage of funds in rural areas became apparent; the pattern of fund circulation in Cambodia is that the surplus of dollars in urban areas flows to the villages through

financial institutions. Against the backdrop of favorable economic conditions, the Cambodian financial sector has experienced rapid growth in recent years and the fact that the penetration of financial institutions into rural areas will facilitate the dollarization in such areas is notable when considering future measures to expand the use of the Riel.

Chapter 5: Currency Exchange Under Payments Dollarization,[7] by Koji Kubo (Gakushuin University) and Vichet Sam (NBC) investigates firms' decisions to select a currency exchange method by using a firm-level dataset from an original survey. According to the empirical model, the analysis shows that firms' dependence on cash payments and perceptions of price differences influence their decisions. Additionally, exchange transactions with money changers are perceived to be superior to those with banks in terms of convenience and distance, but are less secure. This chapter also refers to the policy measurements to promote currency exchange at banks.

Chapter 6: Electronic Payment and Promotion of Local Currency, by Serey Chea (NBC) and Sarat Ouk (NBC), discusses how the recent progress in digital payment systems in Cambodia affects dollarization and how the new infrastructure for digital payments systems, Bakong, would make the use of digital currency more conducive to promoting local currency. Bakong can reach a vast segment of the population with access points not only in urban areas where financial development is high and more dollarized, but also in rural areas where financial inclusion is low and the local currency is commonly used. Given that digital dollarization in Cambodia is already high, the minimal switching cost and easy accessibility would gradually improve local currency transactions once the long-term exchange rate is stable and internal demand is gradually increasing. The history of dollarization in Cambodia shows that the recent persistent dollarization in Cambodia is a result of negative public perceptions of local currency vulnerability in the past and the predominant network externality of US dollars in the financial system. The introduction of Bakong will help to build public confidence in the local currency and will gradually gain the externality of its network.

Chapter 7: Dollarization in Other Emerging Economies and Developing Countries, by Kazue Demachi (Tokyo University of Foreign Studies), discusses the Cambodian case of dollarization from the broad perspectives of internal and historical comparisons. This comparative analysis covers a review of conventional and stylized arguments on dollarization and the structural aspect of dollarization in the world, and concludes with remarks on a more comprehensive view of partial dollarization to cope with the now highly integrated international economy.

Chapter 8: Strategies for Promotion of Khmer Riel, by Vouthy Khou (NBC), Hidenobu Okuda (Teikyo University), and Yasuhisa Ojima (IMF), makes specific policy recommendations for expanding the use of the Riel based on the actual situation of dollarization in Cambodia, as revealed in the first survey. What is unique about this proposal is that it focuses on the use of the

Riel being more widespread than previously imagined and actively tries to introduce financial schemes to further expand the Riel's use. Because the dollarization of Cambodia is progressing in tandem with the development and improvement of the financial system, the more the system is improved, the easier it will be for people to use the dollar. Considering this aspect, it will be difficult to stop dollarization with only a passive stance of trying to encourage people to use the Riel by increasing confidence in it and improving the system, as suggested in past policy recommendations. To expand the use of the Riel, it is necessary to develop a financial system that is based on its use, and policy recommendations that are established on this basis will be an important point of discussion in future policy debates.

Toward the next stage of research

As mentioned above, the dollarization of the Cambodian economy has several distinguishing characteristics: first, financial dollarization and real dollarization have developed in a mutually promoting relationship; second, network externality of currency has played a crucial role in the persistent progress of dollarization under the rapid financial development; and third, the dollarization is of a domestically driven nature in the sense that bank credits in dollars are financed by only domestic deposits in dollars.

While dollarization has had several merits for developing the real and financial sectors of the Cambodian economy, the future sustainability of the highly dollarized economy is uncertain. In addition to the well-known costs of dollarization, such as the lack of a last-resort function of central banks, loss of independent monetary policies, and loss of seigniorage, there is concern that insufficient dollar funds will be available to sustain economic growth. To avoid financial constraints on growth, expansion of the usage of the Khmer Riel as the unit of account means of payment and storage of value is required.

The joint study by the NBC and JICA has revealed for the first time the details of the dollarization of the Cambodian economy. In the future, it will be necessary to use these basic data to promote more precise quantitative analysis and begin to consider specific policies. As policy research to expand the use of the riel enters a new phase, we hope this book will serve as a stepping-stone to the next stage of research.

As the globalization of the world economy progresses, dollarization—that is, all or some functions of domestic currency being replaced by foreign currency—is indeed prevalent in many developing countries apart from Cambodia. In these countries, financial sector development and dollarization have tended to be integrated because dollarization emerged from the initial stages of financial development. Dollarization in Cambodia has features common to many other developing countries in that it is also integrated with financial development. A case study of the Cambodian experience should

thus provide useful information for many developing countries with similar problems, especially African and Central Asian countries. It is our hope that this book, which discusses the major issues of dollarization in Cambodia—the most dollarized economy in Asia—will aid policy-makers and researchers on dollarization issues in countries facing the confluence of financial development and dollarization, as in Cambodia.

Notes

1 The basic skeleton of this section was based on Okuda (2015).
2 The survey on dollarization in Cambodia was conducted by AMRO in 2014. This was the first systematic survey on dollarization and was credited with shedding the first light on the reality of dollarization in Cambodia. However, it was limited in that it covered only the major economic regions of Cambodia, the focus of the analysis was on households with only a brief analysis of corporations, and it was a one-time survey with no continuity.
3 In fact, policies to halt and reverse the ongoing dollarization of the Cambodian economy have been discussed in considerable detail. The basic idea is first to maintain sound macroeconomic policies as a necessary condition for maintaining confidence in the Riel, and second to introduce discriminatory incentives so that the use of the Riel becomes more advantageous to businesses and households than the use of the dollar. Additionally, to facilitate the management of Riel-denominated assets by financial institutions that rely on dollar resources, the development of basic institutional infrastructure, including interbank markets, has been proposed, as well as the introduction of dollar/riel swap products.
4 This chapter is based on Aiba, Odajima, and Khou (2018) and new data.
5 This chapter is based on Okuda and Aiba. (2018). Aiba, Odajima, and Khou (2018), and new data.
6 This chapter is based on Aiba and Lam (2019), Aiba and Pagna (2017), and new data.
7 This chapter is based on Kubo, Sam and Chea (2019).

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1 Development and Structure of Dollarization in Cambodia

Sovannroeun Samreth, Hidenobu Okuda, and Yasuhisa Ojima

1.1 Introduction

In most emerging and developing economies where dollarization has become prevalent, assets denominated in the local currency are substituted by ones denominated in foreign currencies, mainly in US dollars. This is *financial dollarization*, and is a store of value to protect assets, given limited confidence in the domestic currency on the back of political and economic instability. With further economic instability, the role of the domestic currencies in these economies is further constrained by *payments dollarization*, whereby foreign currencies are used as a measure of settlement. Finally, if there is further deterioration in these economies, their domestic currencies lose even their function as units of account, leading to *real dollarization*, where foreign currencies are used to display prices (De Nicolo et al. 2005).

The most notable characteristic of Cambodian dollarization is that dollarization has continued across the three dimensions of financial, payment and real dollarization in the process of rebuilding the financial system after its collapse under the Khmer Rouge. As there were essentially no financial assets available at the time, Cambodia was forced to allow the circulation of an internationally accepted currency to expedite financial development, indicating that dollarization and financial development would go hand in hand. The widespread use of the US dollar began during period of the United Nations Transitional Authority in Cambodia (UNTAC) after the establishment of peace in 1991, with massive aid inflows of US dollar to revive its economy. US dollars played a key role in savings (as a store of value), payments (as a measure of settlement), and value measure functions (as a unit of account). In other words, the simultaneous extension of financial, payment, and real dollarization supported financial development, which also reinforced the dollarization process through credit creation within the web of US dollar lending and deposits.

Dollarization can be reversed when the value of local currency is stabilized with a moderate inflation rate under the process of "de-dollarization"

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efforts. However, despite price stability in both the inflation rate and the nominal exchange rate, "financial dollarization" in Cambodia has continued to expand through growing deposits in foreign currencies. This is an exceptional situation compared with neighboring countries such as Vietnam and Laos.

This chapter begins by explaining the historical development of dollarization then discusses the mechanism of dollarization in Cambodia by paying attention to the interrelationship between the two over the period after the Khmer Rouge regime, particularly during the 1990s and up to 2020, immediately prior to the COVID pandemic. It presents the facts and discusses the driving forces behind the economic growth-related achievements and challenges of the Cambodian economy. Finally, the chapter discusses the sustainability of the dollarization mainly from a macro perspective focused on whether the process of dollarization will continue.

1.2 The Historical Development of Dollarization: Three Phases of Dollarization

In Cambodia, the circulation of foreign currencies is widely observed even though the country has its own currency and does not officially accept foreign currencies as legal tender. The widespread use of foreign currencies in an economy is defined in the literature as the dollarization phenomenon.[1] Given the historical development of dollarization in Cambodia, Okuda (2019) suggests that it should be divided into three phases: (1) after the collapse of the Pol Pot regime in 1979; (2) after the signing of the Paris Peace Accords in 1991; and (3) under the favorable macroeconomic circumstances that have been in place since the 2000s.

1.2.1 Phase 1: After the Collapse of the Pol Pot regime in 1979

In the first phase of dollarization in Cambodia, as part of the revival of financial activity without a reliable domestic currency, the US dollar started to be used informally as cash as a means of settlement (payments dollarization), as a unit of account (real dollarization), and as a store of value (financial dollarization). The Pol Pot regime (1975–1979) had abolished the private ownership of property and banned currency and all market economic activities (see Box 1.1). After the collapse of this regime in 1979, in the financial sector (see Box 1.1), the central bank was rebuilt as the People's Bank of Kampuchea and started issuing new Khmer Riels in 1980. Under the mono-bank system, the Foreign Trade Bank (FTB) resumed providing commercial banking services as a part of the central bank. In 1989, under the two-tier bank system, the central bank was restructured as the National Bank of Cambodia (NBC) by separating out commercial banking services.

Box 1.1 Transition from the Pol Pot Regime

The Pol Pot regime (1975–1979) abolished the private ownership of property and banned currency and all market economic activities in Cambodia. Schools and hospitals were closed and destroyed, and the residents of Phnom Penh and other cities were evacuated to the countryside. With the target of rapidly increasing rice production in Cambodia, the regime forced people to work many hours per day in rice fields and at irrigation construction sites without providing them with enough food (Chandler 2008: Ch. 12). The target was never realized and about one-third of the population died from starvation, disease, and genocide during the four years of the regime.

After the collapse of the Pol Pot regime in 1979, Cambodia faced great difficulties in reviving its destroyed society and economy. The new government adopted a socialist political regime and a planned economic system. People could return to Phnom Penh and other cities. Their livelihoods were revived, although the country had to depend heavily on foreign assistance from the former Soviet Union, Vietnam, other socialist countries, and international humanitarian organizations (Brown 1995: Ch. 3). Schools and hospitals were restored throughout the country, and the national currency was issued and put into circulation for economic transactions from 1980 (Chandler 2008: Ch. 13). As an economic strategy, during the 1980s, the Cambodian government focused on three main economic activities. The first was to focus state economic activities on large-scale production and important economic sectors, such as finance and trade; the second was collective economic activities targeting agricultural restoration and development; and the third was family economic activities, such as retail businesses, small shops, handicrafts, and petty trade (Ross 1990: Ch. 3). This strategy indicated the acceptance of some forms of small-scale private economic activities. A remarkable component of the collective economic activities was the production units, called solidarity groups (*krom samaki*). As a measure for dealing with the low labor force, a solidarity group consisting of seven to 15 families was formed in 1980 for agricultural production, and by 1986 there were more than 100,000 solidarity groups throughout the country (Ross 1990: Ch. 3).

The largest sector of the economy during the 1980s was agriculture, with rice as its main output. Ross (1990: Ch. 3) indicates that the agricultural sector accounted for about 90% of total output and employed about 80% of the Cambodian labor force in 1985. Despite its low performance, rice production increased from about 1.5 million tons in 1980 to more than two million tons in 1986. The industrial sector accounted for only a small share of Cambodia's total output during the 1980s,

and was concentrated in activities such as the processing of agricultural commodities and the production of basic consumption goods, such as soft drinks, cigarettes, soap, paper, and utensils (Ross 1990: Ch. 3). For external economic activities, Cambodia's main trading partners were countries in the former communist bloc.[2] The country's main exports were primary commodities, such as natural rubber and timber, and its main imports included machinery, tractors, vehicles, fuels, and materials for light industry (Ross 1990: Ch. 3).

The 1980s were a period of socioeconomic restoration for Cambodia. As the country's socioeconomic basis, infrastructure, and human resources were mostly destroyed by the Pol Pot regime during 1975–1979, the 1980s was a hard period for Cambodia, as it needed to reconstruct itself as a country with mostly empty hands. The continuing civil war and the lack of human capital and other resources contributed to the slow progress of agricultural productivity and the slow restoration of the industrial sector during the 1980s. However, it is important to note that, despite these difficulties, Cambodia's socioeconomic situation and the livelihood of its people were restored remarkably quickly after the demise of the Pol Pot regime.

Like its neighboring countries, Laos and Vietnam, Cambodia adopted a planned economic system throughout the 1980s. Towards the end of the Cold War, most countries of the former communist bloc, including Cambodia, moved from a planned economic to a market economic system, and the warring groups in Cambodia also made various efforts to end their civil war.

Although the financial system and the monetary economy were rebuilt, the development of financial activities remained limited mainly due to political instability and economic stagnation under the socialist economic policy of the Heng Samrin administration. During this period, bartering was widely practiced, and rice and precious metals such as gold were used as currency. With limited confidence in new local currencies, the dollar, with its strong credentials as an international currency, was used as a unit of accounts, a means of settling transactions, and a store of value. Meanwhile, as deposits in dollars were limited under the socialist financial system, the dollar was used only in cash transactions (Lay et al. 2012). In addition, inflows of dollars were limited through the 1980s due to sluggish foreign trade and financial inflows.

1.2.2 Phase 2: After the Signing of the Paris Peace Accords

In the second phase, as nationwide economic recovery began, an expansion in the holding of dollars became much more prevalent among the public for

payment, real, and financial purposes in the 1990s on the back of the massive inflow of dollars that mainly came in the form of aid flows and depreciation of the Riel. Cambodia experienced a shift in its political and economic systems to multi-party political and market economic systems from the early 1990s. As a result of the various rounds of negotiations, the Paris Peace Accord was signed and the United Nations Transitional Authority in Cambodia (UNTAC) began operations in 1991. After the constituent assembly election held in 1993 with the assistance of UNTAC, Cambodia became a constitutional monarchy in 1994. It adopted multi-party, democratic, political, and market economic systems. The highest priority task for the new government was to reconstruct the war-torn country. To help do so, it adopted a Socioeconomic Rehabilitation Plan in 1991 followed by proposals for various policy plans for enhancing socioeconomic development. These policy plans included the 1998 Triangular Strategy, the 2004 Rectangular Strategy Phase I, the 2008 Rectangular Strategy Phase II, and the 2013 Rectangular Strategy Phase III (Kuoch and Samreth 2020).[3]

During the transition toward its first election in 1993, Cambodia experienced high inflation and rapid depreciation in its currency, the Riel. The nominal exchange rate against the US dollar increased from 500 Riels per US dollar to 2,000 Riels per US dollar between 1991 and 1992, and three-digit inflation rates were recorded (Zamaróczy and Sa 2002). The sense of political uncertainty among the public was also high. Such macroeconomic instability and political uncertainty contributed to a decrease in the public's confidence in the Riel, leading to a preference for holding foreign currencies and other tangible assets (e.g., gold and rice).

Another decisive factor in accelerating Cambodian dollarization during the early 1990s was the huge inflows of external finance used for the operation of UNTAC and the newly founded Cambodian government. The cost of the first general election was estimated at approximately US$1.7 billion, or about 75% of the total Cambodian GDP in 1993 (Lay et al. 2012). The new government continued to borrow from abroad to finance its perpetual budget deficit. Most of the funds that flowed into the country remained in foreign currency and were used to pay for aid activities and government expenditures, and the domestically circulating US dollar funds continued to grow (International Monetary Fund 2011).

The loss of trust in the domestic currency and the widespread availability of foreign currencies in the economy led to the further expansion of dollar holdings as a means of payment, unit of account, and store of value in Cambodia, as indicated by Kang (2005) and Menon (2008a, 2008b). However, at this time the level of bank deposits was still low, the use of the dollar as a deposit currency was low, and dollar-denominated credit creation was limited.

1.2.3 Phase 3: Since the 2000s

Even after achievement of political and economic stability in the 2000s, against the backdrop of the rapid development of the financial institutions

such as commercial banks, Cambodia has experienced even higher degrees of dollarization, mainly through the dollar credit-creation process. Cambodia's economy has showed remarkable economic growth since its entry into the Association of Southeast Asian Nations (ASEAN) in 1999. The growth performance has been underpinned by garment exports to Western markets and domestic activities. Political stability has also been ensured since the second general election in 1998. On the back of this economic growth and political stability, foreign exchange inflows have been enhanced through export proceeds and foreign direct investment (FDI), in addition to aid flows.

Since the end of the 1990s, Cambodia has been developing its financial system in earnest. Financial reforms have been pursued under a policy of minimizing bank ownership and market intervention by the government. Unlike China, Vietnam, and Laos, which are also economically transitional countries, the financial sector has rapidly privatized and private commercial banks have been established through joint ventures with foreign private capital (Unteroberdoerster 2004).[4] In the 2000s, banks and non-banks rapidly increased the amount of funds in dollars by absorbing domestic deposits, borrowing from abroad, and raising capital from overseas, which in turn led to a rapid growth in dollar-denominated credit creation in Cambodia (Khou 2014).

A part of the inflow of dollars has circulated throughout the country in the form of cash. The rest has been absorbed once by banks and then extended as dollar credits. Banks absorb dollars not only in the form of deposits but also in the form of borrowings from abroad or FDI. Through the credit-creation process, the dollar deposit currency is expanded to several times the size of the original dollar deposits. The total amount of supply of the dollar is the sum of the amount of dollars in cash and the amount of dollar deposits. The size of the dollar deposit currency appears in the balance sheet of the integrated banking sector.

As a result, the dollarization of Cambodia advanced to a new stage of dollar-denominated financial intermediation. Payments dollarization, financial dollarization, and real dollarization have all progressed and they are promoting each other. Despite the strength and stabilization of the economy, the financial deepening that has been dollarized advanced after the 2000s. In the Latin American countries where dollarization became a problem in the 1980s and 1990s, financial dollarization began as an asset substitution from financial assets denominated in the home currency to assets denominated in foreign currencies as confidence in the home currency declined due to political and economic instability. Later, as the economic turmoil progressed further, payments dollarization and real dollarization occurred, whereby the functions of the home currency as a means of payment and even a measure of value were substituted by a foreign currency (De Nicolo et al. 2005; Garcia-Escribano et al. 2011).

The dollarization of Cambodia differs from these cases in which the circulation of the international currency dollar was tacitly accepted in the early stages

of rebuilding the financial system from scratch after the fall of the Khmer Rouge regime, and financial development itself proceeded in tandem with dollarization. The use of the dollar expanded rapidly at the same time as UNTAC began to restructure the economy, and payments dollarization, financial dollarization, and real dollarization progressed almost simultaneously. In the sectors, industries and regions with particularly high dollar inflows—that is, Cambodia's growth industries and regions—use of the dollar rather than the local currency rapidly increased as a settlement currency and unit of account (Unteroberdoerster 2004).

In the case of dollarization in Latin American countries, use of the local currency tends to recover as the economic situation stabilizes and the value of the local currency is preserved. In Vietnam and Laos, the financial dollarization ratios reached 40% and 80%, respectively, in the early 2000s, but dropped to 20% and 50% in the mid-2010s as economic conditions improved and the government tightened restrictions on the use of foreign currencies. In Cambodia, on the other hand, the use of the dollar and financial development were integrated, and as the economy stabilized and financial development accelerated, dollar use expanded from cash to deposit currency and "financial dollarization" expanded rapidly.

Consequently, dollarization in Cambodia has emerged as the result of voluntary choices by households, firms, and financial organizations, suggesting that for individual actors, dollarization has been subjective and grounded in microeconomic rationality. At the same time, as dollarization has emerged progressively over a long period, it can be surmised that the relations between the various economic actors have reached a self-restraining Nash equilibrium that stabilizes the system (Greif 2006).

1.3 Macroeconomic Structure and Dollarization

1.3.1 Economic Growth

After a period of slow socioeconomic progress during the 1980s, the period from the 1990s to the 2010s was generally a remarkable period of economic recovery and rapid growth for Cambodia. Table 1.1 shows the average annual growth rates of real gross domestic product (GDP) per capita in Cambodia, in a developing country group, and in the world in different periods between 1995 and 2019. From the table, the average growth rates in Cambodia were much higher than the average growth rates of developing countries and the world throughout the 1990s, 2000s, and 2010s. More specifically by decade, during the 1990s (1995–1999), the average growth rate of real GDP per capita in Cambodia was around 4.4%, while the average annual growth rate for developing countries was around 2.1% (Table 1.1). The growth performance of Cambodia would have been higher had it not been for the negative effects of the Asian financial crisis and the domestic armed conflicts.

Table 1.1 Average GDP per capita growth rates (%) in Cambodia and selected groups

Period	*Cambodia*	*Developing countries*	*World*
1995–1999	4.4	2.1	1.7
2000–2009	6.6	4.4	1.6
2010–2019	5.4	3.7	1.8
1995–2019	**5.7**	**3.6**	**1.7**

Data source: World Development Indicators, World Bank (2021a).

Note: Developing countries refer to the group of low–and middle-income countries.

The 2000s (2000–2009) were a period of better economic performance for Cambodia. The nearly three-decade civil war came to a complete end in 1998 when the remaining former Khmer Rouge group surrendered. Although it was disturbed by the global financial crisis in 2008 and 2009, the average growth rate of Cambodian real GDP per capita in the 2000s was around 6.6% (Table 1.1). This growth rate was significantly higher than that of other developing countries and the world generally. Entering the 2010s, the average annual growth rate of real GDP per capita in Cambodia was also high, at about 5.4% over the period 2010–2019.

In general, since the shift to the market economy since the early 1990s, Cambodia has achieved remarkably high economic growth. This achievement lifted Cambodia from being a low-income country to a lower middle-income one in 2015.[5] With the significant achievement of economic growth during the 1990s until the 2010s, the living standards of the Cambodian people have also greatly improved. Cambodia's GNI per capita increased from US$250 in 1995 to US$1,530 in 2019, according to data from the World Bank (2021a).

Sectoral Growth with Structural Change

In the economic growth process, whether or not economic structural change occurs is very important. Growth that is not accompanied by structural change may not significantly improve the living standards of the majority of the population and may further increase income inequality. As discussed by Kuoch and Samreth (2020), for Cambodia—like the patterns of economic growth and development in other regional countries—economic growth between the 1990s until the 2010s was accompanied by structural change in both the economic sector and the employment structure.

The Cambodian economy has shifted from having a very large share of agricultural production to having a higher share of industry-based production. Figure 1.1 illustrates the shares of agriculture, industry, and services in GDP in Cambodia between 1995 and 2019. The figure shows the expansion in the industrial sector share and the decline of the agricultural share in the economy. Specifically, the former decreased from about 48% in 1995 to about

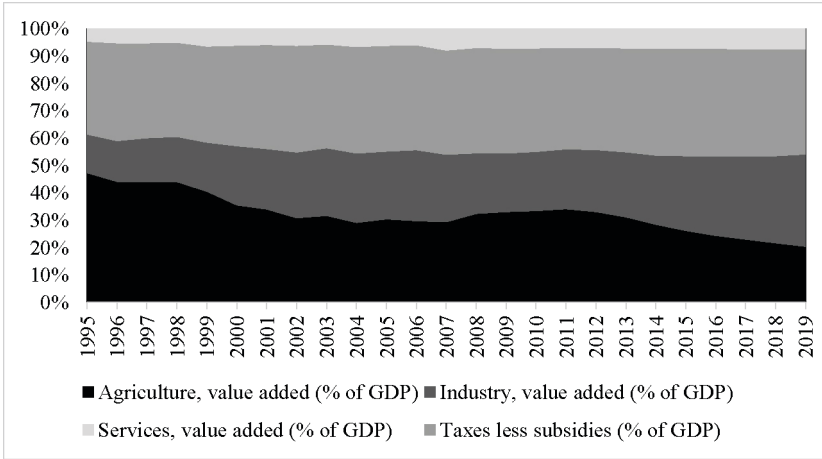

Figure 1.1 Value-added shares in GDP by sector between 1995 and 2019

Data source: World Development Indicators, World Bank (2021a).

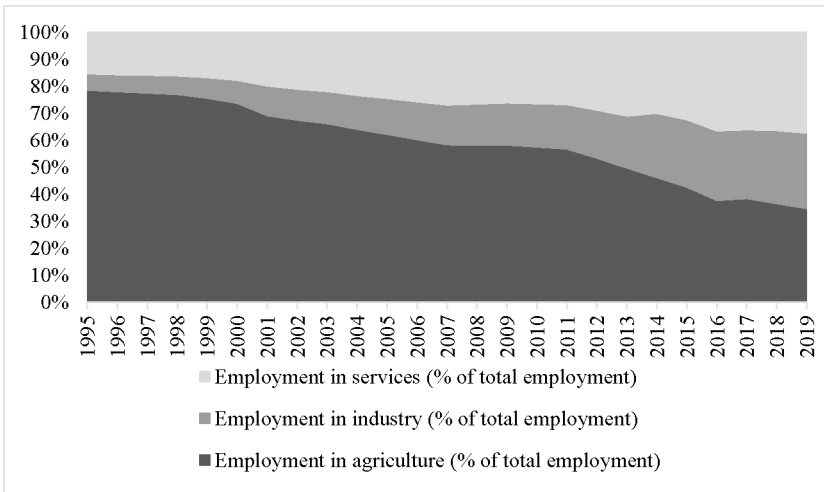

Figure 1.2 Employment shares by sector between 1995 and 2019

Data source: World Development Indicators, World Bank (2021a).

21% in 2019, while the latter expanded from slightly above 14% to about 34% in 2019.

A notable structural change in employment in Cambodia, from a pattern dominated by employment in the agricultural sector to significantly higher shares of services-based and industry-based employment patterns, also occurred between the 1990s and the 2010s, as illustrated in Figure 1.2. This

structural change in employment was rapid during the 2010s. The share of employment in the agricultural sector declined from about 57% in 2010 to about 35% in 2019. This decline was accompanied by a remarkable increase in employment in both the industry and services sectors. Despite this vibrant structural change in the economic sector and shift in the employment patterns in Cambodia toward being more industry based, it is worth noting that garment and footwear related products still account for a high share of manufacturing sector production. The value added from the garment and footwear sectors accounted for about 11% of the total output in Cambodia and 74% of total merchandise exports were garment and footwear products in 2018 (International Labour Organization 2019). Another trend to note is that tourism-related activities also account for a significant share of economic activities in the Cambodian services sector.

Demand Side of Growth

Looking at the rapid economic growth of Cambodia in the 2000s from the demand side, this growth was achieved by proactively utilizing overseas demand under favorable world economic circumstances and the improvement of the domestic political and social environment in Cambodia. Industries that achieved remarkable growth included several labor-intensive exporting industries such as the garment and footwear and simple assembly industries; international tourism based on world-famous historical ruins such as Angkor Wat; and agriculture, with exports to overseas markets commencing. As exports expanded and the economy grew, domestic investment was actively induced in the manufacturing and tourism sectors centered on export industries.

This is seen in Figure 1.3, which shows the components of effective demand in the Cambodian economy as percentage shares of GDP. Household final consumption accounts for the largest share, about 70% of GDP. However, as the country's economy grew, the share gradually declined. Although they temporarily declined during the global financial crisis period of 2008 and 2009, exports of goods and services accounted for a significant share of about 60% of GDP. As exports drove the economy to grow, the ratio of gross domestic capital formation to GDP tended to increase, accounting for about 20% of GDP. The Cambodian economy also shows a pattern of high dependency on the import of goods and services, and trade balances have been continuously in deficit. Since exports and imports are strongly linked, the ratios of both imports and exports to GDP also change in conjunction with each other. However, the trade deficit in effective demand has shown a downward trend.

Supply-side Factors Enhancing Economic Growth

From the perspective of the supply side, an increase in output (economic growth) in a country can be achieved by an increase (accumulation) in human and physical capital and an improvement in productivity.[6] Human capital refers not only to labor force availability but also to its quality. The building

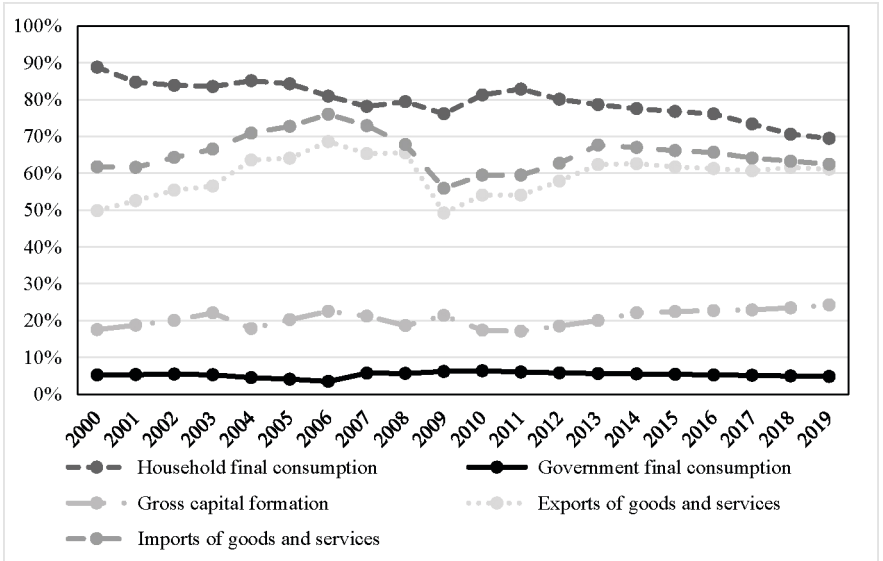

Figure 1.3 Structure of effective demand (% of GDP at current market prices)

Data source: Key Indicators for Asia and the Pacific, Asian Development Bank (2021).

of human capital comes from improvements in education levels and the health performance of the people. Physical capital refers to infrastructure, such as roads, ports, the power supply system, and buildings. Its accumulation comes from investment, including domestic investment and FDI. For a developing country, foreign aid also plays an important role in building infrastructure (physical capital). The productivity of a country reflects how productively that country can produce output, given its physical capital and human capital levels. Two factors generally determine a country's productivity: technology and efficiency can both be affected by governance and institutional quality. A country with higher-quality governance and institutions (for instance, low corruption, a higher degree of ease of doing business) should have higher productivity in terms of producing goods and services.

Labor Force Abundance and Improvement in Human Capital

Following the Pol Pot regime of 1975–1979, Cambodia experienced a baby boom during the 1980s (Kuoch and Samreth 2020). Now, Cambodia has a high share of working-age population, which grew from approximately 53% of the total population of about nine million in 1990 to approximately 64% of the total population of about 16 million in 2019 (Table 1.2). The high share of the population aged 15–64 reflects the abundance of the labor force for economically productive activities.

Table 1.2 Total population and the share of population aged 15–64 years in Cambodia

Year	*Total population*	*Share of population aged 15–64 (% of total population)*
1990	8,975,597	52.8
2000	12,155,241	55.3
2010	14,312,205	62.9
2019	16,486,542	64.2

Data source: World Development Indicators, World Bank (2021a).

Table 1.3 Selected indicators for education and health in Cambodia

Year	***(I) Education indicators***	
	Lower secondary completion rate	*Primary completion rate*
	(% of relevant age group)	*(% of relevant age group)*
1997	17.4	17.2
2010	49.4	85.2
2019	57.7	91.0
Year	***(II) Health indicators***	
	Life expectancy at birth (years)	*Prevalence of undernourishment (% of population)*
2001	59.3	23.6
2010	66.6	13.3
2019	69.8	6.2

Data source: World Development Indicators, World Bank (2021a).

Note: Years were selected by considering data availability.

The quality of the labor force in terms of education and health in Cambodia also improved during the 1990s and 2010s. While it is difficult to directly observe the education level and health performance of the labor force in Cambodia due to the lack of data, the improvements in both health and education at the country level can be good evidence of an increase in labor force quality. Between the 1990s and 2010s, Cambodia managed to improve both the education level and health of its people. This can be attributed to various factors, including efforts by the government and assistance for socioeconomic development from the international community (Kuoch and Samreth 2020).

Table 1.3 shows selected education and health indicators in Cambodia for selected years. As the table shows, the completion rates of primary education as a percentage of the relevant age groups improved significantly from less than 20% in 1997 to over 90% in 2019. The completion rate for lower secondary education also improved significantly from the 1990s, from less than 20% in 1997

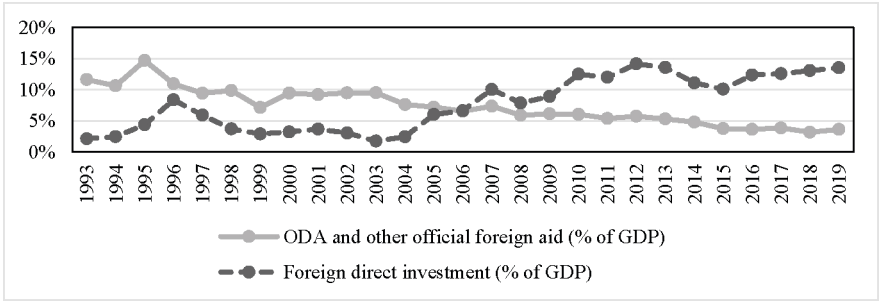

Figure 1.4 Shares of ODA and FDI in Cambodia between 1993 and 2019

Data source: World Development Indicators, World Bank (2021a).

to nearly 60% in 2019. For health indicators, the table also shows the improvement of both life expectancy at birth and nourishment levels. The prevalence of undernourishment decreased from about 23% in 2001 to about 6% in 2019.

Foreign Aid and FDI as a Major Source of Physical Capital Accumulation

After the first general election, a new Cambodian government was formed in 1993. Following this, the economic sanctions imposed on Cambodia during the 1980s were lifted (Hang 2012: Ch. 3). For Cambodia, the 1990s was marked by rapid inflows of foreign aid and FDI due to active open economic policies adopted by the new government. Figure 1.4 illustrates the shares of official development assistance (ODA) and other official aid and FDI inflows into Cambodia between 1993 and 2019.

As shown in Figure 1.4, the share of foreign aid accounted for more than 10% of Cambodia's GDP in general during the 1990s.[7] During this period, among the Organisation for Economic Co-operation and Development (OECD)'s Development Assistance Committee (DAC) countries, Japan, the United States, and Australia were the leading bilateral aid donors to Cambodia. From the early 2000s, South Korea and China also emerged as main donor countries to Cambodia. The aid share from South Korea was more than 10% of the total aid from DAC countries for most years from the early 2010s (World Bank 2021a). Although data are limited, Cambodia had received more than US$3 billion in the form of official development assistance from China up to 2014, according to aid data published by the Institute for the Theory and Practice of International Relations at William and Mary College.[8] For multilateral donors, international institutions, such as the World Bank and the Asian Development Bank, have been the leading institutions providing aid to Cambodia.

Foreign aid to Cambodia has been used mainly for socioeconomic restoration and the enhancement of economic growth and development. It has been

used for infrastructure construction and improvements that help to enhance domestic economic activities and improve connectivity between Cambodia and its neighboring countries.[9] However, it is important to note that foreign aid inflows into Cambodia as a percentage of GDP have declined since the early 2000s, while FDI inflows as a percentage of GDP have increased. These contrasting trends should not be surprising given the fact that, as a country develops, it is natural for FDI to increase while foreign aid declines.

Looking at FDI in more detail, like foreign aid its share in GDP has been remarkably high, although its trend in the 1990s fluctuated due to the interruption by the relatively unstable political environment. It showed a rapidly increasing trend from the early 2000s. Among other factors contributing to this trend were the important roles of the relative political stability after the end of the civil war in 1998 and macroeconomic stability. The trend was also enhanced by the integration of the Cambodian economy into regional and world markets after Cambodia became a member country of ASEAN in 1999 and a member of the World Trade Organization (WTO) in 2004. Although political and macroeconomic stability and economic integration have provided a good environment for investment in Cambodia, the rapid increase of FDI inflows may not have been achieved without the active policy efforts by the government since the 1990s.[10] This includes investment incentives, such as the Qualified Investment Project (QIP) status provision. An investment project can generate favorable conditions regarding profit tax for a determined period if it can obtain QIP status from the government. This policy has contributed to the rapid increase of both domestic investments and FDI. Asian countries such as China, South Korea, Malaysia, Japan, and Thailand have been the main source countries of FDI into Cambodia according to the Council for the Development of Cambodia. The garment and footwear, energy, and construction sectors have mainly attracted FDI inflows.

Productivity from Governance and Institutional Quality Perspectives

The productivity of a country reflects its potential production capacity given its physical capital and human capital levels. Technology level and efficiency performance can affect productivity. Examining the technology level is not an easy task. However, given the globalization era, technology transfer and catch-up among countries have become more commonplace. Although the speed of transfer and catch-up may depend on the absorption capacity of a country, the level of technology generally increases with the global trend. Cambodia is no exception as it has actively adopted an openness policy since the early 1990s. Given this, it is natural to consider that Cambodia has also experienced technological progress that has contributed to the improvement of its production capacity (productivity). Another factor affecting a country's production capacity through productivity channels is its efficiency performance, which can be observed from its governance and institutional quality. Various indicators in

Table 1.4 Ease of Doing Business Index for ASEAN countries in 2019

Country	*Ease of Doing Business Index*(1)
Singapore	2
Malaysia	12
Thailand	21
Brunei Darussalam	66
Viet Nam	70
Indonesia	73
Philippines	95
Cambodia	144
Laos	154
Myanmar	165

Data source: Doing Business Project, World Bank (2021b).

Notes: (1) 1=most business-friendly regulations. Rank among 190 countries.

Table 1.5 Corruption Perception Index (CPI) in ASEAN countries in selected years

Rank in 2019 for ASEAN countries	*Country*	*Score in 2012 (Scale: 0–100)*	*Score in 2019 (Scale: 0–100)*	*World ranking in 2019 (180 countries)*
1	Singapore	87	85	4
2	Brunei Darussalam	55	60	35
3	Malaysia	49	53	51
4	Indonesia	32	40	85
5	Vietnam	31	37	96
6	Thailand	37	36	101
7	Philippines	34	34	113
8	Myanmar	15	29	130
9	Laos	21	29	130
10	Cambodia	22	20	162

Data source: Corruption Perception Index, Transparency International (2021).

Note: A lower score indicates a higher level of corruption.

a country, such as the corruption level and business environment, are widely used to examine governance and institutional quality.

Table 1.4 and Table 1.5 illustrate two indicators: the Ease of Doing Business Index and the Corruption Perception Index (CPI) in ASEAN countries. The Ease of Doing Business Index, published by the World Bank (2021b), reflects the business environment in a country and ranks countries by the level of their business-friendly regulations.[11] From Transparency International (2021), the CPI is defined as an index capturing the perception of the overall corruption among public officials and politicians in a country.[12] For the business environment, Table 1.4 shows that Cambodia ranked 144 out of 190 countries

Table 1.6 Poverty rate at the national poverty line Gini coefficient in Cambodia in selected years

Poverty and inequality	*1997*	*2003*	*2012*
Poverty rate (% of total population)	-	50.2	17.7
Gini coefficient	37.1	36.7	35.9

Data source: World Development Indicators, World Bank (2021a), Standardized World Income Inequality Database v9.1 (Solt 2020).

Note: Years were selected by considering data availability.

worldwide and eight out of the ten ASEAN countries. Regarding corruption, Cambodia's performance in 2019 lagged behind all ASEAN countries and was slightly worse between 2012 and 2019 (Table 1.5).

A relatively unfavorable business environment and high corruption can increase the cost of business activities, affecting a country's production efficiency; they can have a negative impact on its economic productivity. Given this situation, improving governance and institutional quality should be a priority for policy actions in Cambodia designed to enhance growth and development. This has been recognized by the government, which has implemented various reforms and policy actions. For instance, online business registration has been launched to improve the business environment, and an Anti-Corruption Unit was established to fight corruption.

1.3.2 Poverty and Inequality

Although a thorough study may be needed for an impact evaluation, there is no doubt that the various socioeconomic plans and policies adopted by the Cambodian government, as mentioned above, have contributed not only to economic growth but also to poverty and inequality reduction in Cambodia since the early 1990s.[13] Table 1.6 illustrates the poverty rate and the Gini coefficient for disposable income in Cambodia. It is apparent that the country succeeded in reducing poverty during the 2000s and 2010s. However, the rural poverty rate is still much higher than the urban poverty rate (Asian Development Bank 2014). Income inequality in Cambodia also decreased between the 1990s and 2010s.

Against the backdrop of their differences in living standards and economic activities, the difference in the dollarization landscape between urban and rural areas in Cambodia is remarkable. In general, the degree of dollarization in rural areas is lower than in urban areas. Based on a household survey, Odajima (2016) found that households in rural areas hold a larger share of Riels in their income and expenditure than those in urban areas. From an enterprise survey, Aiba and Tha (2017) show that, for firms' transactions, foreign currency is mainly used in urban areas, while in rural areas the Riel is also widely used.

1.3.3 The Financial and Monetary Side

External Financial Balance

Looking at the financial and monetary side of Cambodian economic growth, rapid economic growth has been financed by the persistent inflow of funds from abroad over the last two decades. Figure 1.5 shows Cambodia's domestic savings and domestic investment (gross capital formation) as a percentage of GDP. Although the domestic savings and domestic investment have increased over time, and the gap between the two has been narrowing, the former has been exceeded by the latter in most years between 2000 and 2019. The shortfall of domestic funds had been covered by inflows of funds from abroad (transfers minus factor payments). When domestic investment exceeds domestic savings, the current account in the balance of payments is in deficit. Looking at Figure 1.6, which summarizes Cambodia's balance of payments, both the trade account and the current account have been continuously in deficit. However, the country's financial account has always been in surplus, and the amount of surplus has overwhelmed the amount of deficit in the current account. As a result, the overall balance for Cambodia, which summarizes the net inflow of foreign funds, such as the inflow of foreign funds like foreign aid, borrowing from abroad, and FDI, has been in surplus. This means that over the past 20 years, funds that have flowed from overseas have continued to accumulate in Cambodia every year.

Funds flowing from overseas are mainly bilateral and multilateral foreign aid and direct investment. As illustrated in Figure 1.4, foreign aid was the major source of the inflow of foreign funds in the 1990s. In the 2000s, as

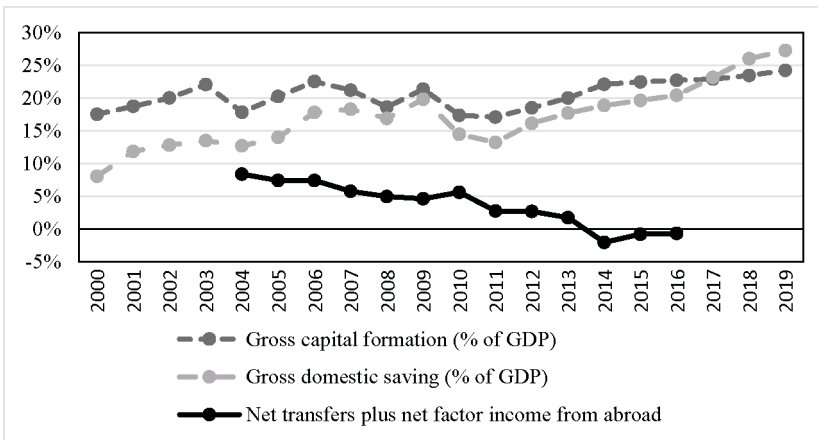

Figure 1.5 Savings and investment (% of GDP at current market prices)

Data source: Key Indicators for Asia and the Pacific, Asian Development Bank (2021).

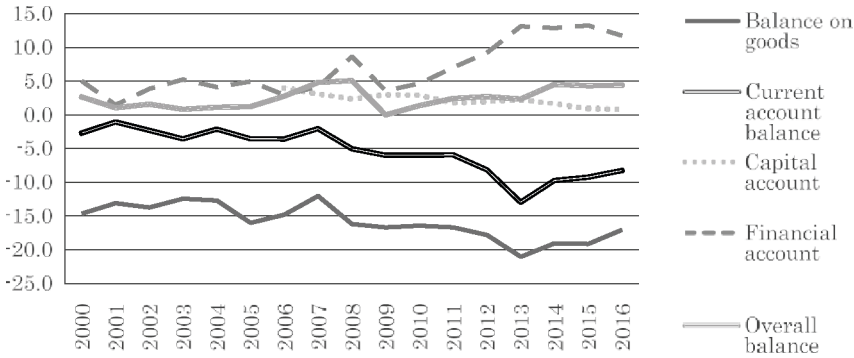

Figure 1.6 Balance of payments (% of GDP at current market prices)

Data source: Key Indicators for Asia and the Pacific, Asian Development Bank.

the economic situation improved, the share of foreign aid in GDP has been decreasing and foreign investment funds have increased. The ratio of FDI to GDP has surpassed that of foreign aid to GDP since the mid-2000s. Besides FDI, other private funds from abroad have accounted for a significant portion of the surplus financial account. The amount of the inflow of foreign funds has significantly exceeded the amount of the current account deficit and, as a result, the overall balance has been in surplus for more than ten years. This shows that the economic growth of Cambodia has been well financed by overseas funds.

Money Supply of Dollars

We can anticipate that if the supply of money cannot keep pace with economic growth, the shortfall will constrain the further growth of an economy. In a highly dollarized economy such as Cambodia, increasing the supply of US dollars is essential for ensuring economic growth. Over the past two decades, the additional currency that is needed for sustaining growth has been covered by annual inflows of a large amount of US dollars to Cambodia. The ultimate source of US dollar supply in Cambodia is the inflow of foreign funds from overseas. Dollarization will proceed only if there is a continuous supply of US dollars that meets the demand for them. As shown in Figure 1.7, since the overall balance of Cambodia has been in a continuous surplus, the huge inflow of dollar funds has been sustained over the past two decades.

Part of the inflow of US dollars is circulated throughout the country as cash. The rest is absorbed once by banks and then extended as US dollar credits. Banks absorb US dollars not only in the form of deposits but also in the form of borrowings from abroad or FDI in banks. Through the credit-creation process, the US dollar deposit is expanded to several times the size of the initial US dollar deposit. The total amount of supply of US dollars is

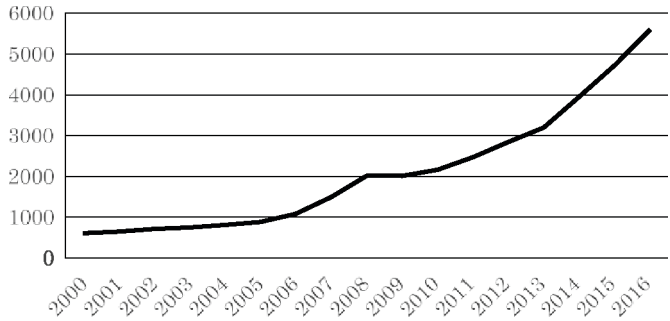

Figure 1.7 Accumulated overall balance (US$ million, as of the end of the period)

Data source: Key Indicators for Asia and the Pacific, Asian Development Bank.

the sum of the amount of US dollars in cash and the amount of US dollars in deposits. The size of the US dollar deposit appears in the balance sheet of the integrated banking sector.

The activities of financial institutions have received attention in recent years as a determinant of dollarization. The choices of households to keep their savings and firms to borrow in US dollar from banks are generated through their transactions with financial institutions, stemming from banks providing accounts and undertaking lending in that currency. From this perspective, the provision of services in US dollars by financial institutions is a source of funds, which serves as an accelerator of dollarization. The activities of financial institutions link financial and payments dollarization (Catao and Terrones 2000; Basso et al. 2007). Financial institutions consider this a business decision aimed at maximizing their profits, but this behavior provides a financial inducement to households and firms and affects the formation of the financial system as a whole.

The stock market in Cambodia is largely underdeveloped, and the primary role of the provision of capital is held by commercial banks, specialized banks, and microfinance institutions. These financial institutions that provide capital are of two kinds. One kind, although it largely uses US dollars for its financial transaction, also uses Riels, utilizing its deposits in both currencies as its financial resource. The other exclusively uses US dollars for its financial transactions, using its deposits in US dollars as its financial resource.

Demand for Money in Dollars

Dollarization in Cambodia has spontaneously formed over a period of more than 20 years under a liberal economic and financial system. Consequently, dollarization in Cambodia has emerged as a result of voluntary choices by households, firms, and financial institutions, suggesting that for individual actors, dollarization has been a subjective aspect grounded upon

microeconomic rationality. At the same time, as dollarization has emerged progressively over a long period, it can be surmised that relations between various economic actors have reached a self-restraining Nash equilibrium that stabilizes the system, as discussed earlier.

Since foreign currencies in circulation cannot be observed, foreign currency deposits (FCD) in financial institutions are often used as an indicator to illustrate the degree of dollarization in a country. From National Bank of Cambodia (2019), the share of FCD in total broad money (M2), including FCD, in Cambodia increased from about 40% in 1993 to over 80% in 2019. This indicates very high and persistent dollarization in Cambodia, although the country has generally experienced both macroeconomic and political stability over the last two decades. This persistence may have resulted from the hysteresis effect of dollarization and network externalities of dollar-based financial development, as discussed and statistically indicated by Menon (2008a), Samreth (2011), and Okuda (2017). Over recent years, there have also been various studies on dollarization in Cambodia at the micro level. For instance, Odajima (2016) and Aiba et al. (2017) provide illustrations and analyses of household behavior of holding domestic and foreign currencies in Cambodia using nationwide survey data from 2,273 randomly selected households. Okuda and Aiba (2018) examine firms' behavior on capital structure under Cambodian's highly dollarized credit market using survey data on 856 randomly selected firms across the country. These previous studies, which used a micro-level approach, provide various important findings on and implications for both household and firm behaviors

Research on dollarization had long focused on financial dollarization. According to Ize and Yavati (2005), there are three main explanations for financial dollarization: the portfolio choice approach, in which assets are held in US dollars by households and other savers as a means of minimizing the fluctuations in earnings from their assets; the credit risk paradigm, in which firms raise funds in US dollars to reduce the risk of bankruptcy; and the financial environment paradigm, in which funds are held in US dollars because of deficiencies in the market and legal system. The explanation most frequently adopted is the portfolio choice approach, in which households have assets in US dollars. Prior studies of Cambodia's dollarization have certainly adopted this as their hypothesis (Kang 2005; Menon 2008a; Samreth 2010, 2011). This approach seems to provide an effective explanation of dollarization by savers, such as households, prior to the 2000s, given the lack of stability in the political and economic situation. During that period, Cambodia's economy was characterized as sluggish, and there were dramatic fluctuations in the inflation rate while the exchange rate between the Riel and the US dollar continued to worsen. Therefore, it was considered that the US dollar was a better currency as a store of value. However, for the period since the 2000s, it is difficult to use the portfolio choice approach as an explanation for the ongoing dollarization. This is because, during this period, the economic climate improved, and after the Lehman shock the Riel–dollar exchange rate has

largely remained steady. Hence, there was no real difference in profitability between assets in US dollars and Riels. Rather, from the 2000s, it has been argued that, despite the stabilization in the country's macroeconomic situation, Cambodia's continuing dollarization contradicts the portfolio choice approach hypothesis (Menon 2008a).

Although there is no research that applies the credit risk paradigm hypothesis to firms in Cambodia, such as household portfolio choice decisions, the macroeconomic instability and the worsening of the Riel's exchange rate against the US dollar in the 1990s can explain firms' decisions to raise funds in US dollars. However, for the period after the 2000s, during which there was an improvement in the microeconomic climate and a stabilization in the exchange rate, it is difficult to use this hypothesis as a convincing explanation for continued dollarization. The financial environment paradigm exists in cases where the domestic financial system is underdeveloped and financial regulation on the use of foreign currency is not in place. Cambodia's financial system was certainly undeveloped, but not to the extent that conducting transactions in the local currency was obviously inferior compared with conducting them in a foreign currency. In addition, with the great improvement in macroeconomic environment since the 2000s, the financial system has developed rapidly, making it difficult to explain the continued dollarization in accordance with this hypothesis.

In Cambodia, payments dollarization and real dollarization have served as preconditions for financial dollarization. In response to such situations, research has emerged, looking at currency as a network externality (Valev 2010). The greater the number of people using a currency, the higher its utility value. In the case of Cambodia, the extent to which more people were using US dollars than Riels led to higher utility (Eichengreen and Hausmann 2005). When a currency is acting as a network externality, even if the rate of inflation decreases and the value of the domestic currency improves, this will not weaken the role of US dollar holdings. This is because both the dollar and the domestic currency retain their values in the same manner; thus, more of the country's savings will continue to be in US dollars because of the dollar's essential role in expressing values and payments in the economy. Samreth (2011) sought through an empirical study to point to this network externality as being a powerful factor in explaining dollarization.[14]

During the process of economic reconstruction in Cambodia in the early 1990s, the US dollar was widely used as a means of payment. Subsequently, with the spread of the currency and the increase in financial activity, more people came to utilize the US dollar as the means for their payments, and thus payments dollarization developed along with the economy. As the economy stabilized and finance developed, it seemed that the network of dollar transactions was expanded by the spread of the cash economy and the movement of financial activity from the urban area to the rural area. Therefore, the US dollar as a network externality significantly restricted the possibility of making use of US dollars for transactions illegal. In Cambodia,

the government has actually acquiesced to the widespread use of US dollars, and there are no legal restrictions on savings in the US dollar or on exchange between the US dollar and the Riel in the parallel foreign-exchange market. Overall, there are no legal impediments to the network externality of the US dollar.

1.4 Limitations on the Sustainability of Dollarization

1.4.1 Further Economic Growth

After its independence from France in 1953, Cambodia enjoyed a period of peace and remarkable socioeconomic development during the 1950s and 1960s. However, it fell into a nearly three-decade civil war after a coup d'état in 1970. Through the 1970s and early 1980s, Cambodia experienced various changes in both its political and economic regimes. The UN-sponsored first general election in 1993 ended Cambodia's global isolation and turned a new page in Cambodian history. The country moved from being a socialist country to a constitutional monarchy with the adoption of a multi-party democratic political system. It also shifted from its planned economic system to a market economic system. The period of the 1990s until the 2010s has been a period of economic recovery and rapid economic growth and development.

Structural change in both economic production and employment patterns to more industry-based ones has been observed in Cambodia. Both poverty and inequality have decreased significantly. Generally, the living standards of the Cambodian people have dramatically improved since the early 1990s as a result of various factors, including political and macroeconomic stability, foreign aid and FDI inflows, the abundance of a young and lower-cost labor force, and the improvement in labor force quality. However Cambodia also faces various challenges and issues in its path toward long-term economic growth and development, including the need for diversification of industry, the need to improve its governance and institutional quality, and the need for de-dollarization. Although various efforts have been made by the government to deal with these issues, more effective measures and policy actions may be necessary.

1.4.2 Pros and Cons of High Dollarization

High dollarization can have both benefits and costs for countries such as Cambodia, which used to experience long periods of socioeconomic instability. These benefits and costs are well discussed and analyzed in previous studies, such as Kem (2001), Zamaróczy and Sa (2002), Kang (2005), Samreth (2010), and Duma (2011), among others. Based on this research, the benefits may include the following. High dollarization may have enhanced financial sector development in Cambodia due to the availability of depositing foreign currencies in

domestic financial institutions under an environment where a lack of public trust in domestic currency was observed. High dollarization may also have helped to stabilize price and purchasing power in the domestic economy due to the widespread use of foreign currencies as a unit of account, a medium of exchange, and a store of value. Moreover, there is also a possibility that high dollarization has contributed to the enhancement of FDI inflows and trade activities through reducing the exchange rate risks for investors and economic agents.

For the costs regarding high dollarization, the following points may be considered based on previous studies. High dollarization can reduce the seigniorage for a country. This refers to the profit resulting from issuing currency. However, the widespread use of foreign currencies in a country (i.e. high dollarization) limits its ability to gain from seigniorage. Zamaróczy and Sa (2002), Kang (2005), and Samreth (2010) provide detailed discussions and analyses on the loss of seigniorage for Cambodia. Another important cost is that high dollarization significantly restrains the implementation and effectiveness of monetary policy because it is very difficult for monetary authorities to control or adjust the domestic money supply to control inflation if the economy is highly dollarized and foreign currencies are widely circulated in the domestic economy (Zamaróczy and Sa 2002).

The accurate evaluation of whether or not high dollarization since the early 1990s has brought Cambodia more benefits than costs, or vice versa, is very difficult and is beyond the scope of this study. However, many people would agree that since the early 1990s, high dollarization has played an important role in enhancing financial sector development and promoting the integration of the Cambodian economy into the world economy through its role in facilitating FDI inflows and trade activities, as discussed above. The Cambodian financial system has been relatively underdeveloped, and Cambodia has lacked human resources and institutional capacity in many fields due to the long period of civil war and genocide. Given this, even if there were no constraints from the high dollarization, the answer to the question of whether or not monetary policy in Cambodia has been implemented effectively is uncertain. However, along with economic growth and development, both human resources and institutional capacity in Cambodia have generally improved, and its financial sector and economy have become more sophisticated. This has increased the importance of the role of monetary policy in contributing to the adjustment of the economic environment in recent years. In creating space for monetary policy to gain its momentum, reducing dollarization (de-dollarization) in the economy is very important. In recent years, Cambodia has also recognized the importance of de-dollarization, and various efforts have been made to promote the circulation of its domestic currency, the Riel, as is evident from the regular annual celebration of "Riel Day" by the National Bank of Cambodia. However, the path toward uprooting such a high and long-time level of dollarization is not an easy one. More time and effort are needed for complete de-dollarization.

1.4.3 Concerns about further dollarization

The precondition for Cambodia to be able to continue reaping the benefits of dollarization is the continued maintenance of the amount of capital in dollars that is essential for growth (Roubini 2001; Jacome and Lonnberg 2010). Because the development of Cambodia's financial system has lagged, most payments are settled in cash, and the preservation of vast amounts of dollars in circulation is essential for payments dollarization. In addition, reserve funds in dollars are essential both to fund the dollar economy in payments dollarization and to fund dollar savings for financial dollarization. However, because the central bank is no longer able to function as the lender of last resort in a dollarized economy, it is essential for banks to maintain a high level of funds denominated in dollars in circulation.

Cambodia has secured dollar funds by receiving vast amounts of financial aid in foreign funds from international organizations and advanced countries, as well as by developing tourism and expanding exports to the United States in labor-intensive industries in recent years. However, should Cambodia's economy continue to develop and earnings increase, the supply of funds as aid will taper off. In addition, should the developed nations—and particularly the US economy, on which Cambodia is very dependent—suffer a recession, then tourism will slump and exports to developed countries will stagnate. Furthermore, the increase in wages that can be expected to coincide with economic development will increase labor productivity, which will be essential to continue expanding exportation. The maintenance of funds for growth that is essential to support the dollarized economy is certainly not guaranteed.[15]

To continue to support dollarization and expand the economy, it is important to seek the development of technologies and institutions so the dollar funds that are in use can be consumed as effectively as possible. For example, the effective use of dollar funds should be aided by the implementation of a market in banking services. In contemporary Cambodia, a market in banking services has not been established. As a result, there is no efficient balancing of funds between banks with surplus funds and banks that are short of them. Balancing the excess and deficiency in dollar funds between banks would contribute to the economy's capacity for growth. This would also be effective in integrating and unifying development in expansion in terms of the scale of banking operations, and at the same time increase their efficiency.[16] Currently, a number of small-scale banks are operating in Cambodia, but their amalgamation and subsequent expansion in the scale of their operations would enable the effective use of dollar funds by suppliers of the capital. In addition, there is a need to increase the efficiency of banking policies for aspects such as developing technologies, investing in industries, modernizing the legal system, and improving the transparency of information to create an environment for institutionalizing financial markets, developing the financial system in

under-developed regions, and freeing up industrial finance. Finally, the introduction and diffusion of an electronic payment system would be useful in mitigating restrictions on funds for growth by economizing on the cash required.

Notes

1 See Calvo and Végh (1992) and Ize and Yeyati (2003), among others, for definitions of dollarization.
2 The countries included the former Soviet Union, Vietnam, the former East Germany, the former Czechoslovakia, Poland, Hungary, and Bulgaria (Ross 1990: Ch. 3).
3 Hirota, Fukuyo, and Hatsukano (2016: Ch. 3) provide a good overview of the socioeconomic policies and plans adopted by the Cambodian government.
4 In Cambodia, the Vision and Financial Sector Development Plan for 2001–2010 (FSDP 2001–2010) was formulated in 2001 and the Financial Sector Development Strategy 2011–2020 (FSDS 2011–2020) was adopted in 2012.
5 Cambodia's gross national income (GNI) per capita in 2015 was US$1,060. This was slightly higher than the minimum threshold GNI per capita (US$1,025) of lower middle-income group, proposed by the World Bank.
6 One basic approach to discussing the sources of economic growth is to employ an aggregate production function, which is a mathematical function illustrating the relationship between the total output in a country and its production factors (physical capital and human capital and the productivity level). See Weil (2013: Ch. 2) for a detailed explanation of the framework of the aggregate production function.
7 Godfrey et al. (2002), among others, provide a good discussion on the role and impacts of foreign aid on the Cambodian socioeconomic situation.
8 See www.aiddata.org/china.
9 Among others, the Kizuna Bridge and the Tsubasa Bridge were constructed through a grant aid from Japan. These bridges help boost the transportation network between Cambodia, Vietnam, and Thailand as part of Southern Economic Corridor network.
10 It is also important to note that the relatively low labor wage in Cambodia is also a factor attracting FDI.
11 The World Bank (2021b) provides a detailed definition and explanation of the construction of the index.
12 The detailed definition and construction methodology of the index are available in Transparency International (2021).
13 For instance, a strategy plan for poverty reduction, the "National Poverty Reduction Strategy Paper," was proposed in 2002. Various phases of the rectangular strategy clearly state their focus on growth, employment, equity, and efficiency.
14 However, there seems to be a conceptual problem triggered by Samreth (2011) substituting network externality for a hysteresis effect. Using Eastern European examples, through an investigation into transactions, Valev (2010) directly investigates the importance of network externalities in currency selection.
15 See also Fukuchi (2013) and Horie (2013).
16 The theory that economies of scale exist in banking is also supported by empirical research on Cambodian banks. See, for example, Okuda and Chea (2013).

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2 Dollarization in Households

Vouthy Khou, Daiju Aiba, and Ken Odajima

2.1 Introduction

Even though dollarization has been widely prevalent in recent years across the world, detailed data on foreign currency use at the household level are scarce. In the literature on dollarization, the ratio of foreign currency deposits to M2 (a measure of the money supply that includes cash and other types of deposits that are readily convertible to cash) or to total deposits is used as the measure of dollarization. However, these measures only represent the dollarization in financial institutions—that is, financial dollarization—while dollarization can also occur in the daily transactions of households and enterprises.[1] Since the coverage of the formal financial sector is low in developing countries, the traditional measures could underestimate or overestimate the entire level of dollarization. Thus, knowledge of the daily transactions of households and enterprises is crucial to understanding dollarization at the country level and also to formulating effective policies.

Cambodia is one of the most highly dollarized countries in the world. The dollarization level measured by foreign currency deposits over M2 was 84% as of December 2020.[2] The high ratio of foreign currency deposits in the economy indicates that most of its financial activities are conducted in foreign currency, particularly US dollars. Apart from financial dollarization, the extent of dollarization in transactions by households and enterprises is also high in Cambodia. However, previous discussions have relied mainly on data from the financial sector. To reach a full understanding of dollarization in Cambodia, this chapter provides an overview of dollarization in Cambodian households, based on data from nationwide surveys by the National Bank of Cambodia (NBC) and the JICA Ogata Research Institute (JICA-Ogata-RI). In 2014 and 2017 NBC and JICA-RI conducted a survey to collect the panel data from households and enterprises. These surveys were the first attempt to reveal the real picture of dollarization in the entire country and covered information on basic characteristics and usage of currencies in households and enterprises. While most studies have used aggregated data or anecdotal evidence to analyze dollarization, a nationwide survey enabled researchers to investigate the behavior of economic agents. In this chapter, we empirically

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show the situation of dollarization in Cambodian households using household data from the NBC-JICA surveys, and we discuss the features of dollarization in Cambodia that were revealed.

Recently, there have been an increasing number of studies using survey-based data to analyze the behavior of households and enterprises. Beer et al. (2010) used survey data of households to investigate dollarization in Hungary. Valev (2010) investigated households in Bulgaria, Fidrmuc et al. (2013) and Beckmann and Stix (2015) investigated cross-country survey data of households in Central and Eastern Europe. Survey-based data enable researchers to assess the causes and consequences of currency choice by individual economic agents. Similar to recent studies in other dollarized economies, an increasing number of studies have used micro-data in Cambodia.[3] The NBC-JICA survey is one of the micro-level data sources available for studying dollarization, and it provides detailed information on currency choices in transactions and the denomination of assets and liabilities of individual Cambodian economic agents. Because of the rich and wide coverage of the survey, several studies have investigated the real picture of Cambodian dollarization in households, enterprises, and financial institutions (Aiba and Sok 2017; Aiba and Tha 2017; Odajima and Khou 2017), and also investigated currency choices in household borrowings (Aiba, Odajima, and Khou 2018), currency choices for payment by households (Odajima, Aiba, and Khou 2018), and capital structure decisions by enterprises (Okuda and Aiba 2018).

Using the data from the NBC-JICA survey, we show that transaction dollarization is prevalent, but the extent of it is lower than previously thought. Before the NBC-JICA survey was conducted, there were no data to understand the household behavior of currency choice in daily transaction and financial activities. Our study presents statistics on dollarization at the household level, to provide insights into local currency promotion in Cambodia. The remainder of this chapter is organized as follows: section 2.2 summarizes the hypotheses of choice of foreign currency in transaction and asset holdings by households; section 2.3 describes dollarization in Cambodia using the nationwide survey; section 2.4 describes how dollarization changed from 2014 to 2017; and section 2.5 presents our conclusions.

2.2 Theory of Foreign Currency Use by Households

2.2.1 Search Model and Network Externalities

To understand how a foreign currency comes to circulate in the domestic economy in a transaction, it is necessary to understand the key factors that affect the decision to accept foreign currency in exchange for goods and services. Theoretical search models are suitable frameworks for the purpose because they explicitly model economic agents' decisions to accept a fiat currency in transactions. The search models show that transaction frictions make the intrinsically useless object acceptable as means of payment. The friction is

the absence of the double coincidence of wants. Among many others, Kiyotaki and Wright's (1989) study was one of the starting points for discussion of the handling acceptance of such media for transactions as well as the role of pure fiat money in an economy. The same authors extended their model into a one-country two-currency money model Kiyotaki and Wright 1993 Fiat money is modeled in such a way that it generates some basic cost. The study showed that in the coexistence of two fiat currencies that have different levels of holding cost, if the cost for one currency is sufficiently small and the cost of the other is large, then the agent will use that currency, not the other, for transactions.

Network externalities are one factor determining the choice of currency, and use of currency depends on the probability that the currency is accepted by people in the area. The concept of network effect was incorporated in the search theoretic models by, among others, Dowd and Greenaway (1993) and Uribe (1997). Dowd and Greenaway (1993) treated the effect as a network-related benefit as the utility rises with the number of other agents using the same currency. Uribe (1997) modeled that transaction cost depends on an economy's accumulated experience in using foreign exchange currency as a means of payment. The transaction cost decreases as the level of dollarization in the economy increases because the experience of using foreign currency accumulates in the economy. The accumulation of experience causes this hysteresis.

Valev (2010) empirically investigated the existence of network externalities using a sample of households in Bulgaria. To test this hypothesis, he examined whether the preference of receiving local currency was associated with the frequency of use of foreign currency observed by the respondents in a market. He documented the statistically significant result of this association, which showed that if respondents perceive that there are fewer users of foreign currency in a market, they will prefer to receive local currency.

2.2.2 Convenience (Transaction Cost)

The choice of currency may also depend on the convenience when using it in a transaction. Convenience can be translated into "transaction cost" in economic terms. There are various factors causing transaction costs in the use of the Cambodian Riel (KHR). One of the factors is the bulkiness when carrying many KHR banknotes. Compared with US dollar banknotes, the KHR banknotes have small values—the largest local currency banknote is only the equivalent of US$25. Thus, it is inconvenient and cumbersome to fulfil large transactions in KHR due to the large physical volume of the notes required. Thus, if transaction size becomes larger, households are less likely to prefer KHR for transactions because of the higher transaction costs.

The Cambodian environment, where cash transactions are dominant, augments transaction costs relating to the bulkiness of KHR. Currently, many Cambodian people still do not have access to a formal settlement network

provided by financial institutions. Settlement networks, such as debit card, credit card, and QR code payment, mean people do not have to bring cash for payment. Transactions via bank accounts can avoid the inconvenience associated with large physical volume of banknotes in cash. Odajima and Aiba, and Khou (2019) have empirically documented the evidence that the transaction size is associated to the household preference on currency choice in selling assets, while households become indifferent to currency choice if they have a bank account. Their findings suggest that adjusting transaction cost is the key to promoting or discouraging the use of a currency.

2.2.3 Risks and Returns on the Currency (Portfolio Selection)

Aside from currency choice in transactions, households also make decisions about the currency choice for assets and liabilities. In the literature of dollarization, one of the important theoretical models is that proposed by Ize and Yetagi (2003). Their model assumes that economic agents are rational and have a risk-averse utility function. It is natural to assume that profiles of return and risks are different among currencies in financial assets and liabilities because of exchange rates, inflation rates, and country-specific country risk premiums. Basically, foreign currency assets entail exchange rate risks, while domestic currency assets entail inflation rate risks and country-specific risks for those in developing countries. Economic agents choose an optimal level of foreign currency borrowings and foreign currency assets in their portfolios, depending on the risks and returns. In the literature of dollarization, Jeanne (2005) has also shown that those economic agents with foreign currency income have an incentive to choose foreign currency loans as optimal hedging strategies. An important prediction from those models is that economic agents hedge the risk of exchange rate changes by matching currency composition between assets and liabilities or between income stream and liabilities.

In the empirical literature, using a European household sample, Beckman and Stix (2015) found that currency choice in borrowing is associated with expectation of depreciation, meaning that the risk of declining values of the local currency encourage people to choose local currency for borrowing. In the case of Cambodia, Aiba,Odajima, and Khou (2018) empirically show that Cambodian households are likely to choose foreign currency debts if their incomes are in foreign currency. This suggests that people want to hedge the risks of currency mismatch between income and borrowing. Those studies present consistent findings to the portfolio selection model of choosing currency for debts.

The preference of currency in transaction may also depend on the feature values of the currency. If a household expects depreciation of the local currency, it is less likely to prefer KHR for transactions. In the case of Bulgaria, Valev (2010) documented empirical evidence that the preference for different currencies in receiving payment is dependent on the expectation of the depreciation in local currency.

2.3 Dollarization and Households in Cambodia

2.3.1 Use of Foreign Currency in Daily Transactions

We present the actual situation of Cambodian dollarization using data from the NBC-JICA survey. The NBC-JICA survey was carried out in 2014 and 2017 to collect data on the use of foreign and local currencies by Cambodian households in all 25 provinces. The detail of the survey is described in an appendix to this chapter. Using data from the NBC-JICA survey, we describe dollarization in Cambodia.[4]

First, we show the currencies used in daily transactions by households. The survey asked households for the ratio of foreign currency use in 14 categories of spending. Table 2.1 presents the average of the ratio of expenditure in foreign currencies to total expenditure. It is revealed that US dollars are used for all categories on average in Cambodia, while the extent of the use significantly differs across categories. For generally low-value items, such as food and beverage, alcohol and tobacco, water and electricity bills, or for health needs including toiletries, Cambodian households mainly use KHR. However, for relatively higher valued items, such as house rent, communication, and furniture and appliances, they tend to use f more for spending. This pattern of

Table 2.1 Ratios of foreign exchange expenditure to total expenditure by item (%)

	Expenditure on:	*KHR*	*USD*	*THB*	*VND*	*Number of HHs that answered*
1	Food and beverage	97.0	1.1	1.2	0.7	2259
1.1	Rice	97.0	1.3	1.5	0.2	1320
2	Alcohol and tobacco	96.3	2.3	1.0	0.4	865
3	Housing (rental)	50.8	42.1	7.0	0.0	71
3.1	Water and electricity	93.0	0.3	6.7	0.0	2199
4	Restaurant and eating outside the house	95.8	2.8	1.1	0.3	1896
5	Communication (phone card fees, internet fees, etc.)	61.5	37.4	1.0	0.0	2136
6	Personal care	96.0	2.0	1.8	0.3	2024
7	Transportation	94.9	3.4	1.1	0.6	2096
8	Clothing and footwear	85.5	12.2	2.0	0.3	1869
9	Recreation and culture	81.0	16.5	1.8	0.7	613
10	Medical care	90.5	6.8	2.0	0.7	2156
11	Personal effects	72.1	24.4	3.2	0.3	675
12	Education	89.5	9.3	0.8	0.5	1405
13	Furniture	51.7	45.8	2.4	0.0	424
14	Motorbikes or cars	20.4	76.9	2.6	0.0	284
15	Miscellaneous or other expenses	82.4	16.0	1.4	0.2	2247

Source: The NBC-JICA survey 2017. Authors' calculation.

currency use indicates that transaction size matters when it comes to the currency in particular transactions.

In terms of income level, there is a difference in extent of foreign currency use. Figure 2.1 shows the average ratio of expenditure in foreign currencies and KHR to total expenditure by regions and by income levels, respectively. The Phnom Penh shows the highest ratio of using US dollars, and the second largest ratio for Siem Reap. There are large amounts of capital inflows in

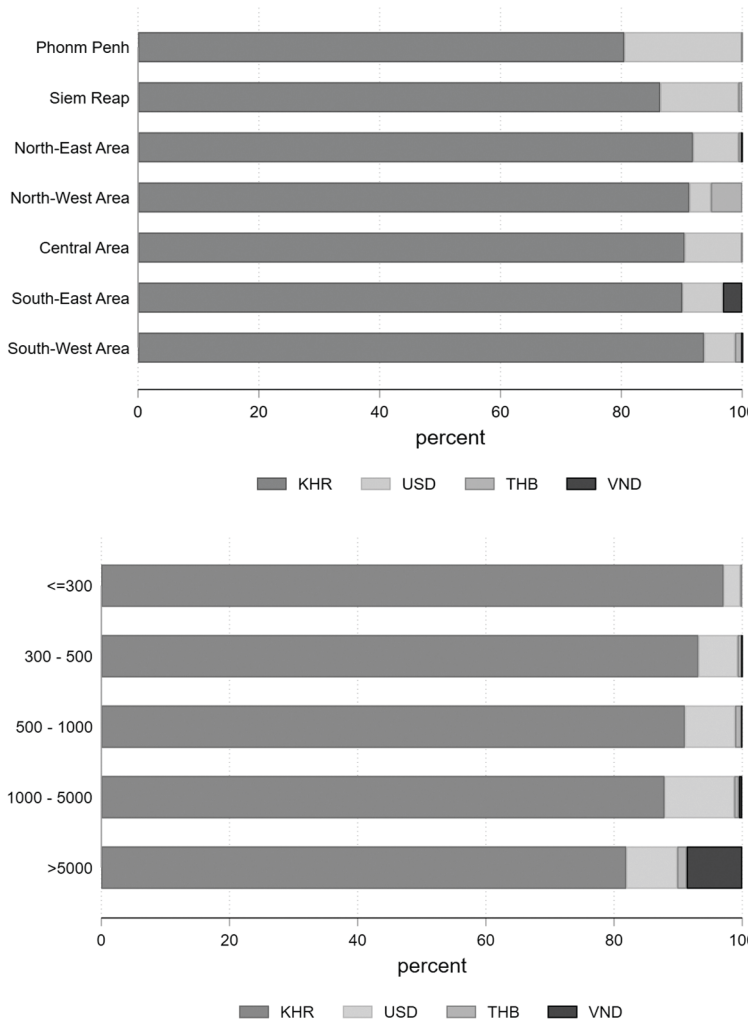


Figure 2.1 Ratios of foreign exchange expenditure to total expenditure by region (upper panel) and income level (lower panel) (%)

Source: The NBC-JICA survey 2017. Authors' calculation.

Phnom Penh and Siem Reap, since there are plenty of tourists and FDIs. Thus, the ratio of US dollars in those cities is high, and network externalities might enhance the usage of US dollars in those cities.

The higher the level of income in households, the more foreign currency is used for expenditure. This might reflect the fact that higher income households are likely to be in large cities, such as Phnom Penh and Siem Reap. It might be because higher income households are running their own businesses, where larger transactions, such as purchase of inventories, durables, or real estate, are likely to occur.

The NBC-JICA survey 2017 also asked about the total amount of income by currencies in the past 12 months. From the data of the survey, the average ratio of household income in KHR was 71.3%, followed by the US dollar at 23.1%, the Thai Baht (THB) at 5.3% and the Vietnamese Dong (VND) at 0.3%. The survey revealed that income is received in KHR for the average Cambodian household. In Figure 2.2, we further investigate the difference in foreign currency in income across regions and across income levels. Figure 2.2 presents the average ratio of income in foreign currencies and KHR to total income. We find that the level of dollarization in household income increases with the level of income and varies by region. Phnom Penh appeared to be the most dollarized region, with the ratio of the US dollar at 45.1%, followed by Siem Reap, the North-West Area and the South-West Area. It is noted that in the North-West Area, the high ratio of foreign currencies is due to a high proportion of Thai Baht as there is a border with Thailand. Many Cambodian people may receive income in Thai Baht from exporting products to Thailand.

Previously, it was anecdotally observed that foreign banknotes (mainly US dollars) were widely used for transactions in Cambodia. However, the JICA-NBC survey revealed that the dollarization in Phnom Penh was a special case, and that KHR was preferred in provincial areas.

Besides affecting income level and region, the level of dollarization also differed across income sources. Figure 2.3 presents the average ratio of income by currencies for each income source. The NBC-JICA survey asked households about their income by income sources. If we look at the agricultural sector, KHR dominates with a mean ratio of 85.5%, followed by the Thai Baht (10.7%) and the US Dollar (3.5%) (Figure 2.2, Panel A). The ratio of KHR income in the business sector was also high at an average of 82.9%, but the US dollar came in second (14.4%) in front of the Thai Baht (2.3%) (Figure 2.2, Panel B). However, in the wage/salary sector, the mean ratio of US dollars was quite high, with an average of 34.1% (Figure 2.3, Panel B).

If we take into account the regional differences in levels of income, we observe that the ratio of foreign currencies increased with changes in income level (especially the Thai Baht for the agricultural sector and the US dollar for the wage/salary sector) and varied across regions (the ratio of Thai Baht is high in the agricultural sector in the North-West Area, while the US dollar dominated in Phnom Penh and Siem Reap in the wage/salary sector).

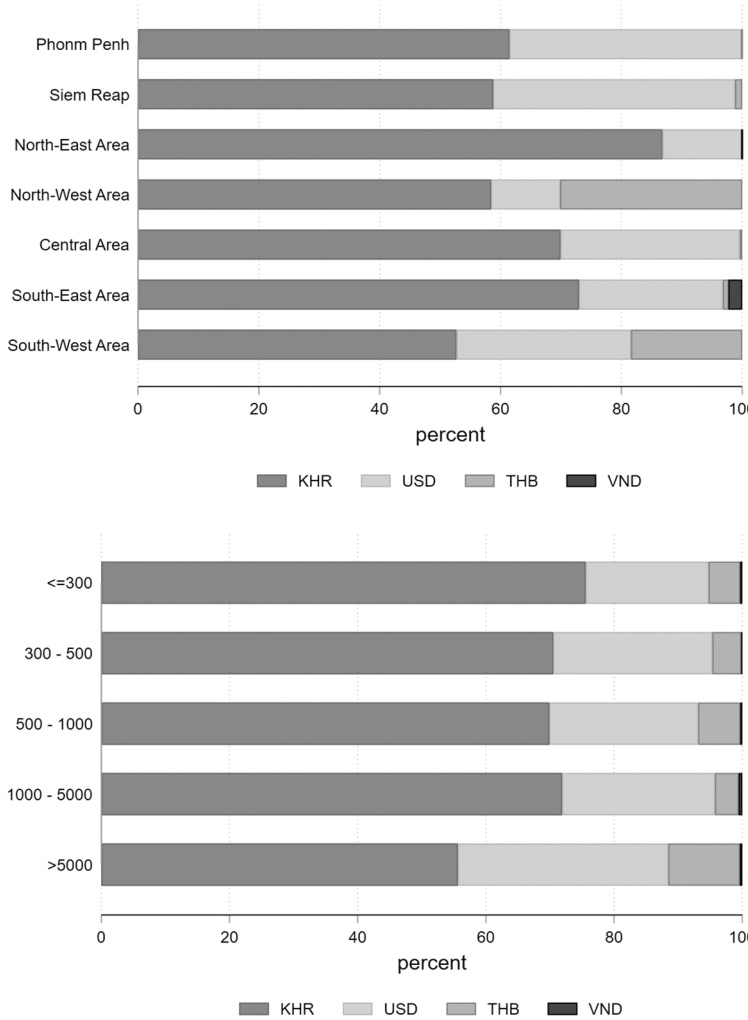


Figure 2.2 Ratio of different currencies in household incomes by region (upper panel) and income level (lower panel)

2.3.2 Preference for Currency by Size of Transaction

There is a pattern in the choice of foreign currency by Cambodian households. As theory suggests, Cambodian households choose foreign currency if the transaction size becomes larger. In the NBC-JICA survey, households were asked about their currency preference in transactions. Specifically, households were asked to choose a currency they would like to accept in sales of their specific assets. For example, if a household had land, the household was asked to give its self-estimated market value of its own assets, and to choose a

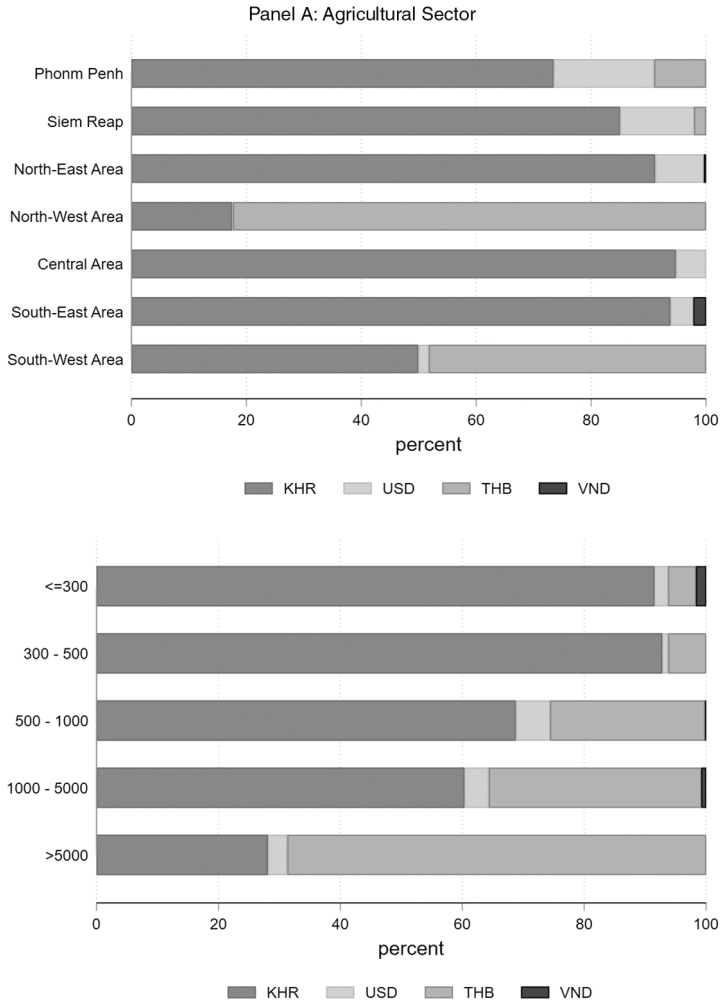


Figure 2.3 Ratio of different currencies in household incomes by sector of activities

Source: The NBC-JICA Survey 2017. Authors' calculation.

currency it would like to receive when selling it. If the household did not have land, the household did not need to answer this question.[5] The NBC-JICA survey covered six types of assets: (1) real estate; (2) furniture and appliances; (3) motorcycles and cars; (4) machinery and equipment for business and personal use; (5) livestock; and (6) inventories for small business/farming.

Figure 2.4 shows the relationship between frequency of answers about currency preference and asset sizes. There is a clear tendency that households prefer US dollars when the sale amount becomes larger. Figure 2.5 shows the frequency of answers about currency preference by type of asset in the whole

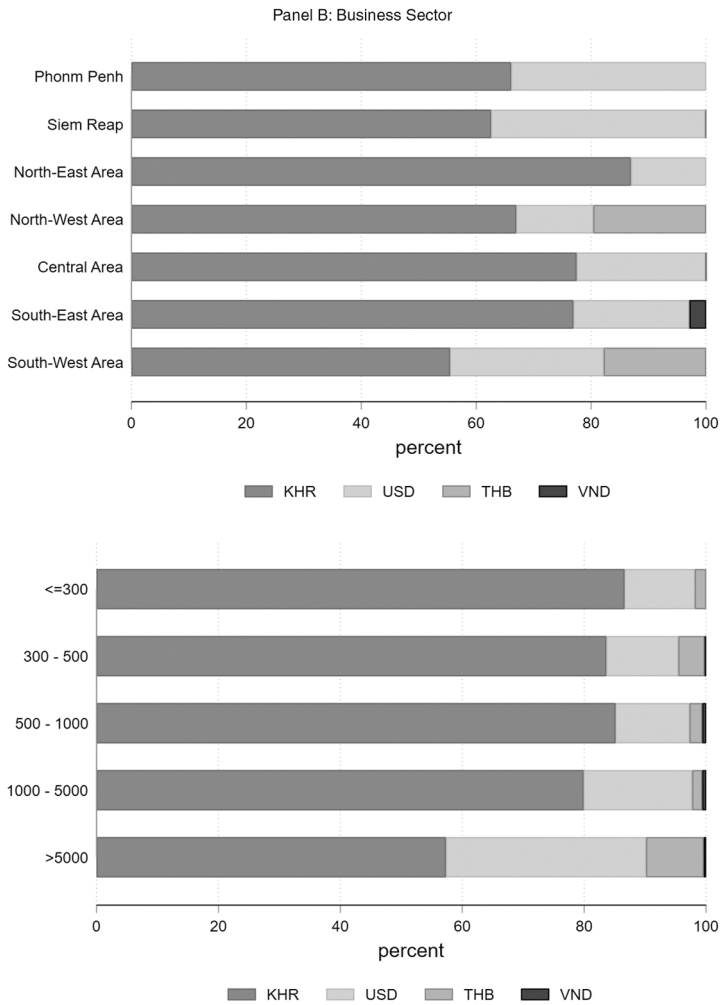


Figure 2.3 (Continued)

household sample. In sales of real estate, 86.1% of respondents preferred to accept foreign currencies. For motorcycles and cars, 85.1% of respondents preferred foreign currency. For sales of machinery and equipment, 52.7% of respondents preferred US dollars and for sales of furniture and appliances, 38.1% preferred foreign currency. For livestock, 16.0% preferred foreign currency and for sales of inventories for business/farming, 20.5% preferred foreign currency. In general, the transaction size of real estate or motorcycles and cars gets relatively larger, but that of livestock or the inventory for small business and farming tends to be smaller. From these findings, currency choice might be affected by business practices in a market as well as size of transaction.[6]

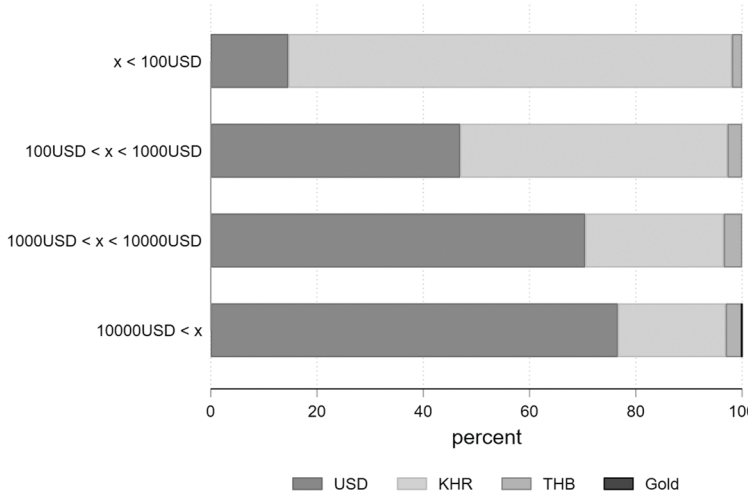


Figure 2.4 Preferred currency accepted for sales of assets by asset sizes

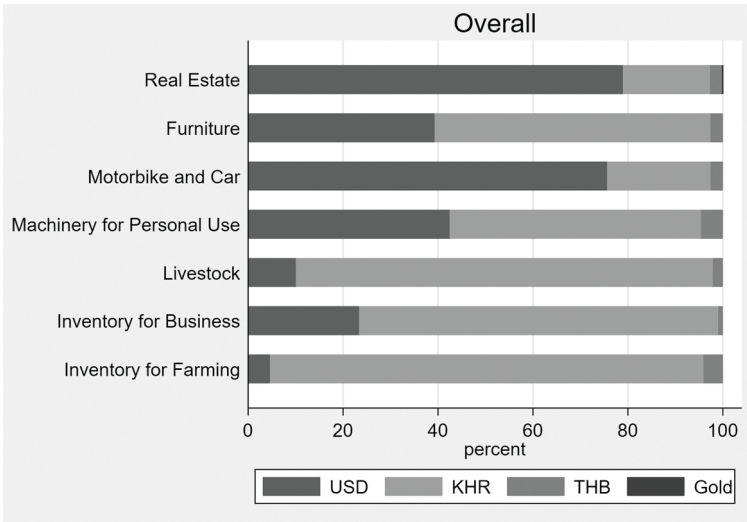


Figure 2.5 Preferred currency accepted for sales of assets

Figure 2.6 gives the frequency and ratios of KHR preference by areas. There is a difference in the level of preference for KHR in selling asset by areas. People in Phnom Penh and Siem Reap prefer US dollars more than those in other areas. Because the foreign direct investment and

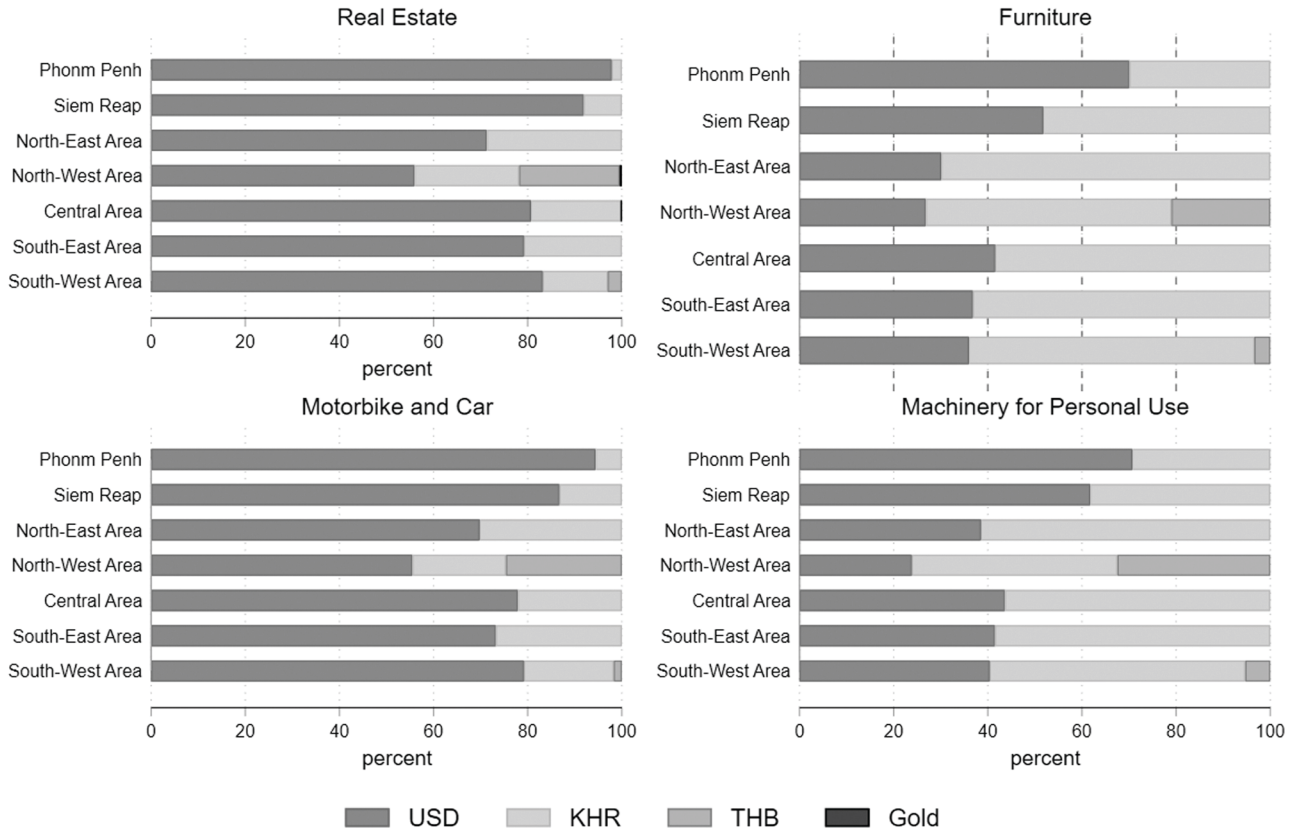


Figure 2.6 Preferred currency accepted for sales of assets by area

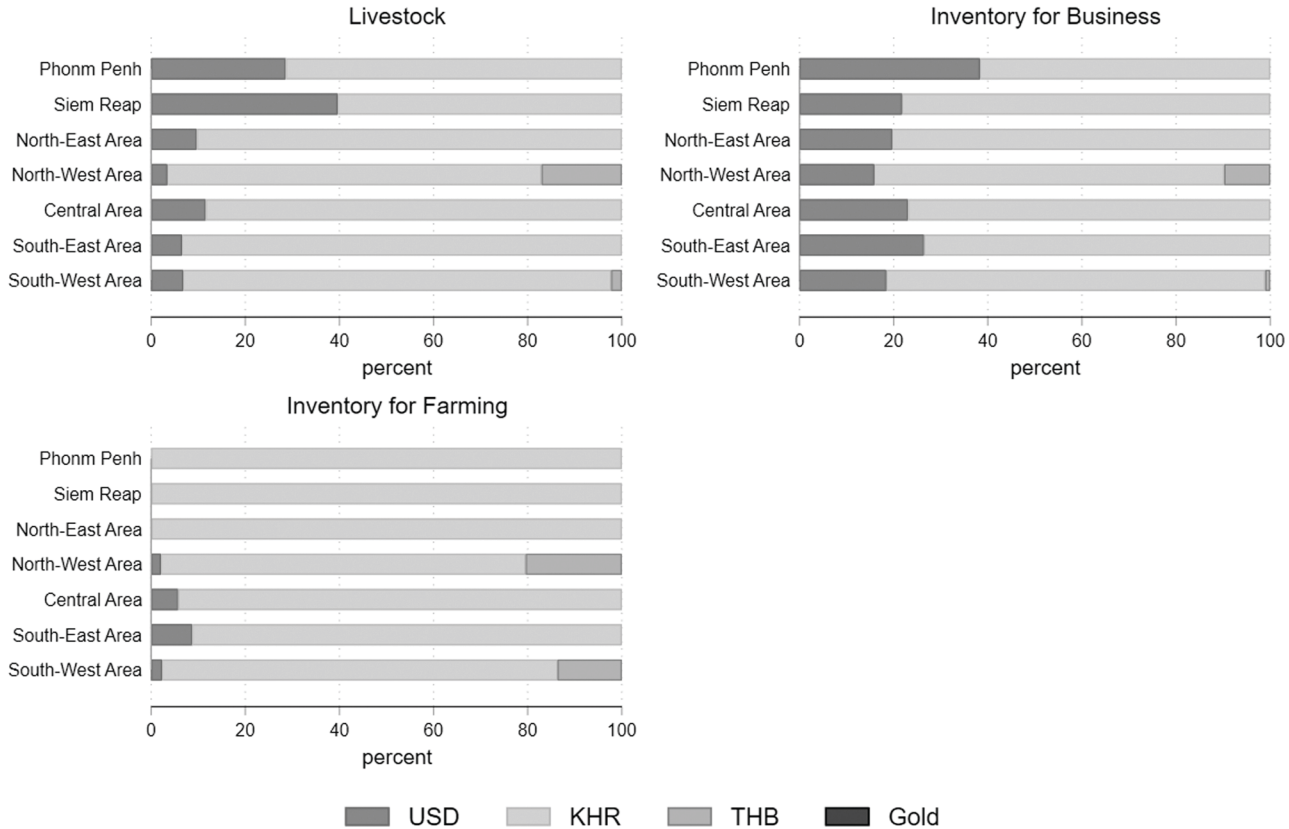


Figure 2.6 (Continued)

tourist inflow are concentrated on the large cities, network externalities of US dollars may be particularly large in Phnom Penh and Siem Reap. Nevertheless, it has a similar tendency to currency preference across areas: for real estate and motorcycles and car transactions people prefer to accept foreign currency, while for livestock and inventories for business/farming, they prefer the local currency. Determinants other than network externalities of communes may potentially affect the currency choice for transactions.

Box 2.1 Regression Analysis of Determinants of Currency Choice in Receiving Payment

Similar patterns are observed between the currencies that households would like to receive and their expenditure behavior. Indeed, transactions involving large amounts are more dollarized than smaller transactions, while in Phnom Penh, Siem Reap, and other urban areas where economic activities are more dynamic than in other regions and rural areas, households are more likely to prefer US dollars. The Thai Baht also had a remarkable presence in the North-West Area. Following Odajima and Aiba (2019), we ran a probit estimation to examine which factor is associated to the currency preference:

$$Prob\left(Foreign\ Currency_i = 1\right) = F\left(\boldsymbol{X}_i\boldsymbol{\beta}\right)$$

$Foreign\ Currency\ y_i$ is a dummy variable that takes the value of 1 if households borrow in foreign currency. X_{it} is a vector of household characteristics that just includes asset values, and dummies for areas. We assume that F(.) is a cumulative standard normal distribution function. We run this model using data of the JICA-NBC survey 2017.

According to the regression results, we observed that, in general, the preference to receive the sales of assets in foreign currency is positively associated with the amount of transactions, except for the livestock asset. As the descriptive statistics suggest, we also observe that households living in Phnom Penh or Siem Reap or urban areas tended to prefer to sell their assets in foreign currency.

Results of the Probit Estimation

	Real estate	*Furniture and appliances*	*Motorbikes or cars*	*Machinery and equipment*	*Livestock*	*Business inventory*
Value of asset	0.001***	0.138***	0.035***	0.110*	0.110*	0.021***
Phnom Penh or Siem Reap	0.123***	0.235***	0.114***	0.224***	0.224***	0.072*
Urban area	0.095***	0.125***	0.077***	0.096***	0.096***	0.055*

Note: ***p < 0.01; **p < 0.05; *p < 0.1. We present part of results from the model used by Odajima and Aiba (2019). The values in the table represent estimated marginal effects.

Table 2.2 Choice of currency in borrowing

Lender	*Currency*			
	KHR	*USD*	*THB*	*Total*
Commercial bank	42	245	10	297
Microfinance institution	108	273	12	393
Family or friends	20	31	4	55
NGO	4	3	0	7
Other informal lenders	16	7	4	27
Refuse to inform	2	1	0	3
Total	192	560	30	782

Source: The NBC-JICA survey 2017. Authors' calculation.

2.3.3 Dollarization in Household Debts and Savings

Next, we present the choice of currency in borrowing. Due to the prosperity of MFIs in Cambodia, access of households to loans from formal financial institutions has significantly improved over the past decade. However, there is a concern in driving foreign currency via formal financial institutions, as documented by Brown et al. (2014). The data of the NBC-JICA survey also collected information on borrowing by households. We present data on which currency Cambodian households borrow and their reasons to borrow in foreign currency.

In the NBC-JICA survey 2017, households were asked about the details of their outstanding loans. The questions covered type of lenders, currency denomination, and loan amounts. Among the 2,273 households surveyed, 700 answered that they had loans (Table 2.2). Given that some households had two or three loans, there were 782 loans in total. Loans in US dollars

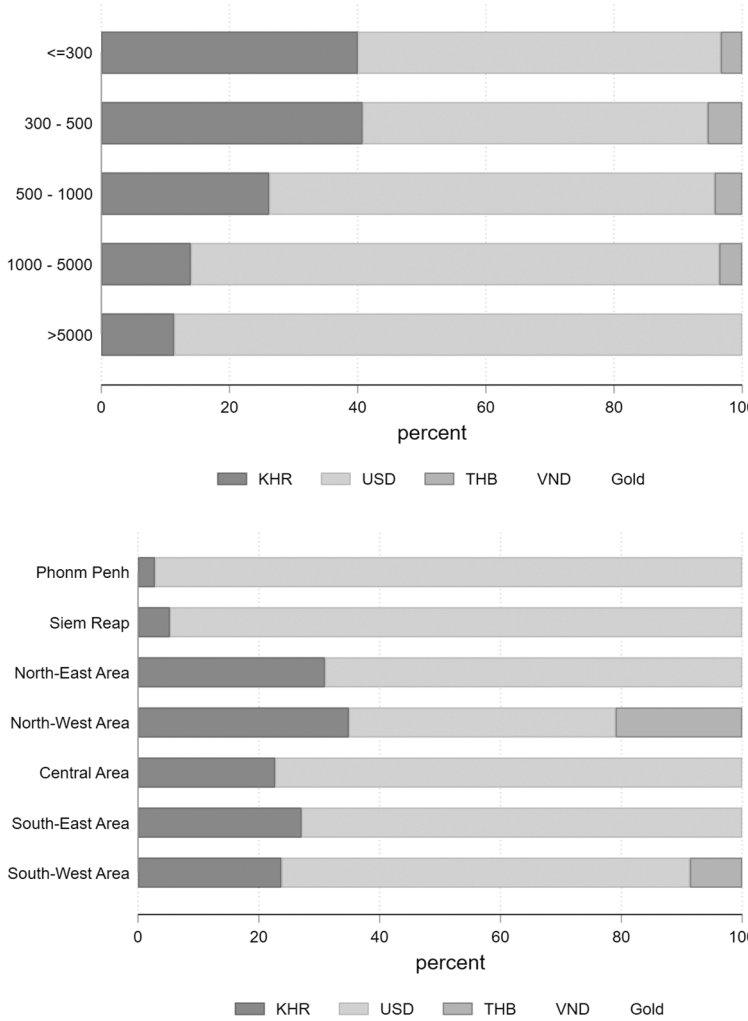


Figure 2.7 Share of currencies in household debt (headcounts) by income level (upper panel) and region (lower panel)

clearly dominated with 560 loans (71.6%), followed by KHR (24.6%) and Thai Baht (3.8%). By type of lender, we observed that the majority of loans from banks (82.3%) and MFIs (69.5%) were in US dollars. We also observed that most loans came from banks or MFIs and that these sources together contributed 88.2% of total loans.

Figure 2.7 presents the percentages of the number of loans by currencies across income level and regions. By region, the loans in Phnom Penh were totally dollarized, while in other areas (except Siem Reap), 20 to 30% of

Table 2.3 Reasons for the loan currency choice

I intended to borrow money in a foreign exchange because … (618 respondents)	*Yes*
It is easier to borrow large amounts of money in foreign exchange	104
The purpose of my loan requires foreign exchange currency amount	60
I cannot find a loan in KHR for the amount I need	6
The interest rate of foreign currency is better	29
The transactions I am involved in require that I pay in foreign currency	382
Do not want to risk exchange rate loss	23
Other reasons	14
I intended to borrow money in KHR because … (235 respondents)	*Yes*
I would borrow KHR if the amount were less than US$1,000	25
Interest rates are better than US dollars	18
Transactions are in KHR	123
Do not want to risk exchange rate loss	35
Other reasons	34

Source: The NBC-JICA survey 2017. Authors' calculation.

loans were made in Khmer Riels. The Thai Baht was also used as a loan currency together with the US dollar and Khmer Riel in the North-West Area. Again, we remark that the proportion of loans in KHR decreases with a rise in income level.

Households were also asked for the top two reasons why they chose a currency in relation to loans taken out in the past two years. The question was only asked to households with debts at the time of the survey. Table 2.3 summarizes the answers to this question. It can be clearly seen that people chose a currency, either KHR or foreign currency, based on the transactions in which they were involved. One noticeable reason for choosing foreign currency is that it is easier to borrow large amounts of money in foreign currencies.

Next, we investigate dollarization in the savings of households. In the NBC-JICA survey, 1,385 households, or 60.9%, declared that they had savings. Emergency healthcare funds appeared to be the main purpose of household saving, while expansion of businesses was the second important reason (Figure 2.8). Among them, only 266 households (19.2%) were saving in a bank or MFI (Figure 2.9). We observed that the proportion of households who used banks/MFIs increased with their level of income. Perhaps people with higher incomes may also possess higher education, and thus they better understand the benefits of saving at financial institutions, or it is possible that some barriers may exist, such as the minimum balance requirement and the distance to financial institutions, which limit the use of financial institution services among poor households. By income level, however, we see that saving in Khmer Riels becomes less popular when income increases (Figure 2.10). By areas, the Thai Baht also had a significant part in saving in the North-West Area, while the VND had a marginal weight in the South-East Area.

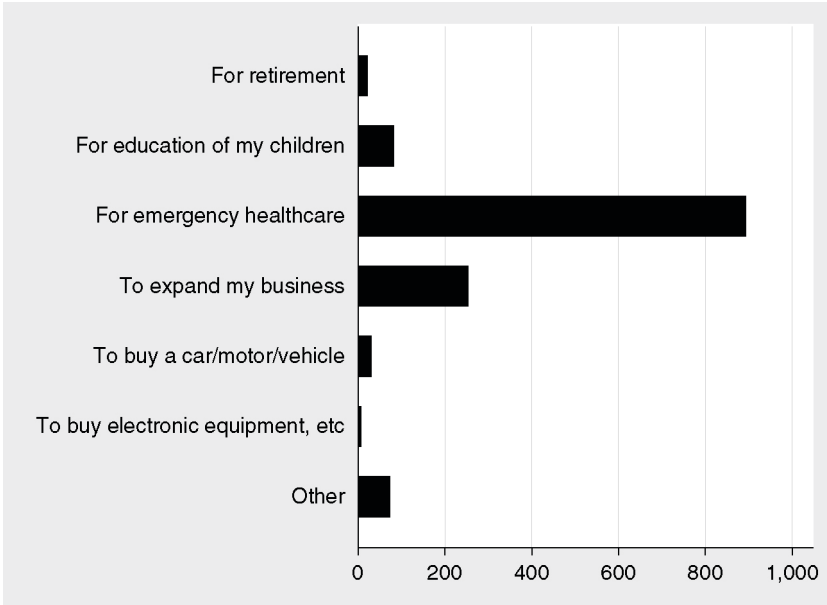


Figure 2.8 Purpose of saving

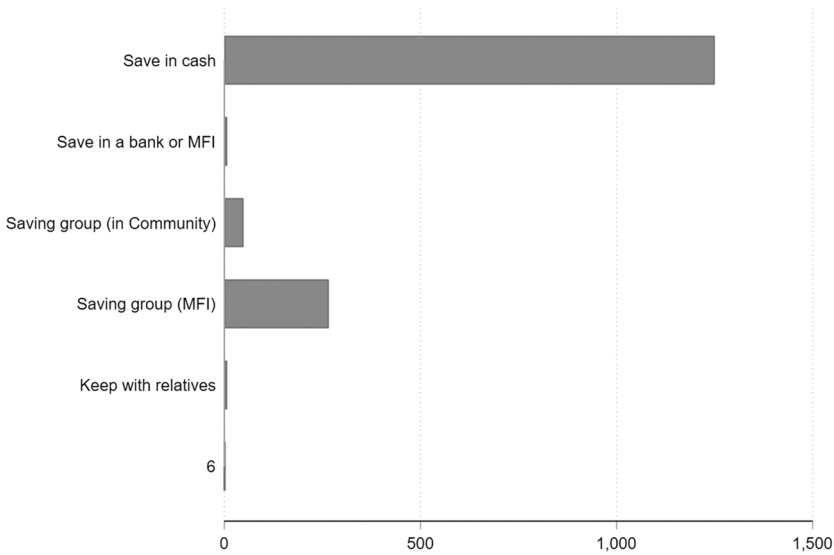


Figure 2.9 Places of savings (upper panel) and saving in a bank/MFI by level of income (lower panel)

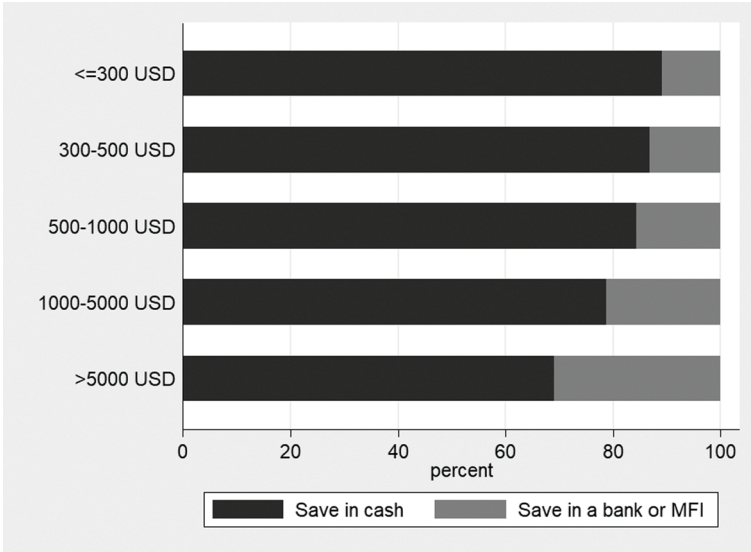


Figure 2.9 (Continued)

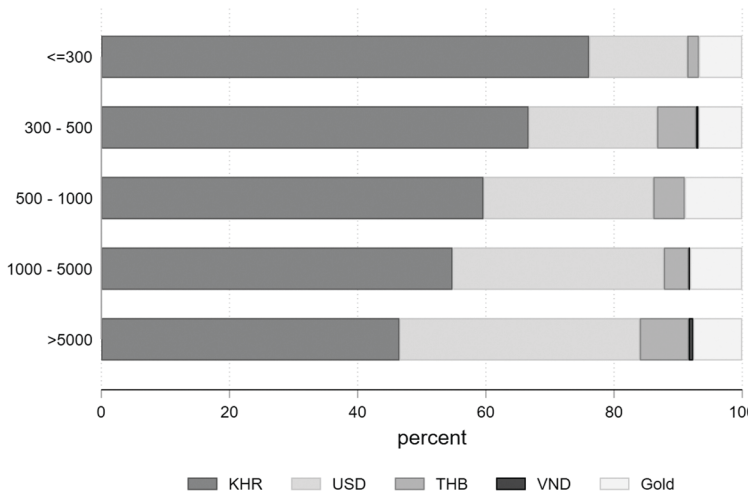


Figure 2.10 Share of currencies in savings (headcounts) by income level (upper panel) and region (lower panel)

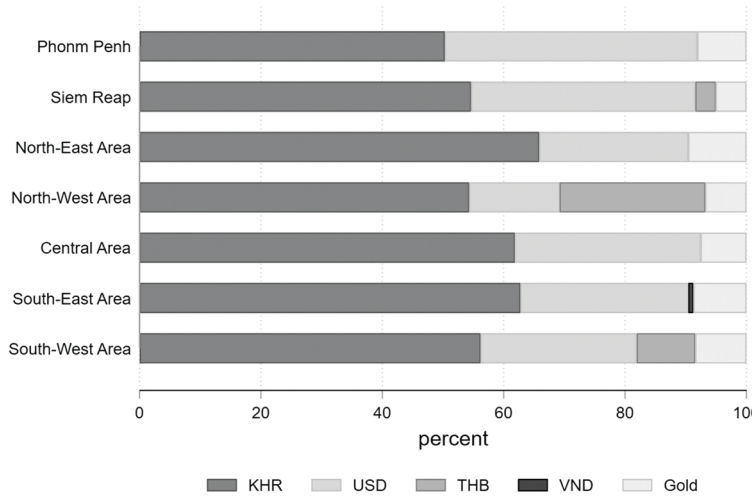


Figure 2.10 (Continued)

Box 2.2 Regression Analysis on Currency Mismatch and Financial Literacy

Fidrmuc et al. (2013) found that hedging foreign currency risks was one of the significant factors that Central and Eastern European households considered before borrowing in foreign currencies. However, in our case we observe that a significant number of households exist that borrow money in foreign currencies despite the fact that their incomes and savings are totally in KHR. This could expose them to exchange rate risks if the exchange rate between KHR and US dollars becomes volatile. As Aiba, Odajima, and Khou (2018) recently found, highly educated people in Cambodia are more likely to exhibit risk-hedging behavior when they borrow money, so we tried to investigate whether there was an impact from financial literacy on risk-hedging behavior, given the available information in the questionnaire. For instance, the NBC-JICA survey asked respondents to answer "True" or "False" to three statements:

1. If someone offers you the chance to make a lot of money. it is likely that there is also a chance that you will lose a lot of money.
2. High inflation means that the cost of living is increasing rapidly.
3. It is less likely that you will lose all your money if you save it in more than one place.

Those who answered these three statements correctly were considered to have high financial literacy. Then we ran a probit regression to examine the relationship between borrowing in foreign currency and the ratio of foreign currency in income/saving by group of people with high or lower levels of financial literacy:

$$Prob\left(Foreign\,Currency_i = 1\right) = F\left(\boldsymbol{X}_i\boldsymbol{\beta}\right)$$

$Foreign\,Currency_i$ is a dummy variable to take the value of 1 if households borrow in foreign currency. X_{it} is a vector of household characteristics. We assume that F(.) is a cumulative standard normal distribution function. The table below presents the results of estimation for low and high literacy groups of households, respectively. We find that the coefficients of the ratio of foreign currency in income/saving for the those with high level of financial literacy are higher and also highly significant compared to the coefficients of those with lower level of financial literacy. This may suggest that people with a high level of financial literacy match their income/saving-borrowing currency better than those with less financial literacy. In any case, we acknowledge that more robust analyses are needed to firmly conclude the impact of financial literacy.

Results of the Probit Estimation

High level of financial literacy		*Low level of financial literacy*	
Dependent variable: borrowing in FC	Marginal Effect	Dependent variable: Borrowing in FC	Marginal Effect
Ratio of FC in income	0.009***	Ratio of FC in income	0.006**
High level of financial literacy		*Low level of financial literacy*	
Dependent variable: Borrowing in FC	Marginal Effect	Dependent variable: Borrowing in FC	Marginal Effect
Ratio of FC in savings	0.012***	Ratio of FC in savings	0.002

2.4 Progress in Local Currency Promotion

In the previous section, we looked at the recent situation of dollarization in Cambodia across areas and income levels of households. Next, we present the dynamics of dollarization in the 2010s using data from 2014 and 2017 of the JICA-NBC survey. Basically, the same households were tracked in both surveys, although some households could not be tracked and had

to be replaced with new households due to rejection or migration from the village. To investigate the changes in the trend of foreign currency use among Cambodian households, we compared those households that participated in both surveys—that is, we created balanced-panel data between 2014 and 2017.[7]

Figure 2.11 presents the changes in the average ratio of income in foreign currencies and KHR to total income. The level of dollarization has slightly decreased in the agricultural and wage sectors and has been almost constant

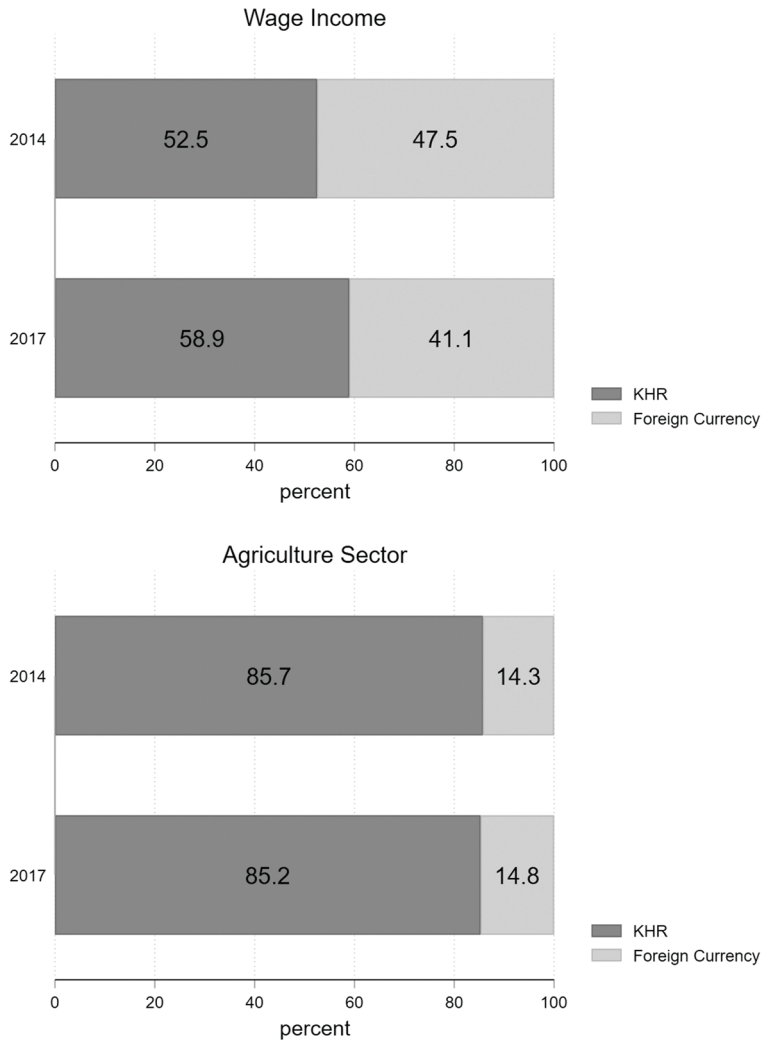
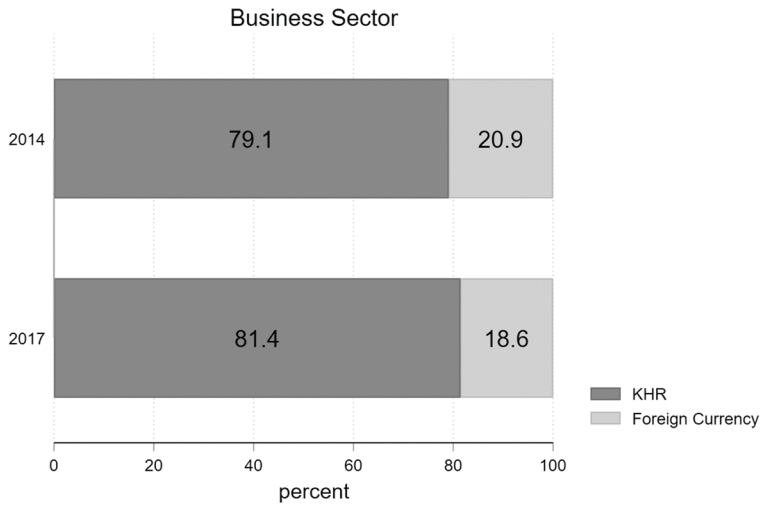


Figure 2.11 Dynamics of income dollarization by sector and region



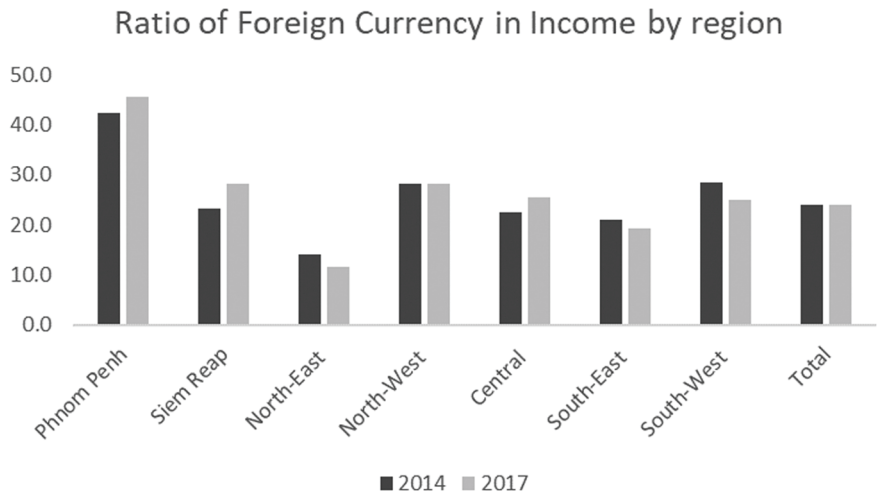


Figure 2.11 (Continued)

in the business sector. By regional area, the ratio of foreign currency in total income increased in Phnom Penh, Siem Reap, and the Central Area, and decreased in other regions. There was an improvement in local currency use, although we did not observe a remarkable change in the level of dollarization of income between 2014 and 2017.

The dollarization of expenditure also changed between 2014 and 2017. Table 2.4 presents the comparison of the average ratio of expenditure in foreign currency for each expenditure item. To compare data between these two

Table 2.4 Ratio of foreign currency in expenditure

Ratio of Foreign Currency in Expenditure by items				*Ratio of Foreign Currency in Expenditure by region*		
	Items	*2014*	*2017*	*Region*	*2014*	*2017*
1	Food and beverage	2.1	2.8	Phnom Penh	20.7	18.9
2	Alcohol and tobacco	4.6	3.4	Siem Reap	11.5	13.0
3	Housing (rental)	43.5	52.9	North-East Area	9.8	5.2
4	Recreation	16.2	17.1	North-West Area	14.7	14.7
5	Clothes and footwear	9.2	13.0	Central Area	9.0	9.4
6	Restaurant	7.5	3.8	South-East Area	8.8	8.6
7	Communication	34.0	36.9	South-West Area	8.3	7.4
8	Education	8.0	10.1	Total	10.2	9.7
9	Health	4.6	9.3			
10	Transportation	3.3	4.8			
11	Furniture	50.7	46.7			
12	Miscellaneous	21.3	16.4			
	Total	10.2	9.7			

Source: The NBC-JICA survey 2017. Authors' calculation.

surveys, we focused on 12 items only. Although the average ratio of expenditure in foreign currency varied by items, the average ratio of total expenditure in foreign currency slightly decreased from 10.2% in 2014 to 9.7% in 2017. The average ratio of total expenditure in foreign currency has also evolved differently in different regions (Figure 2.8). The dynamics of dollarization seem to be different by areas. The average ratio decreased in Phnom Penh, the North-East Area, the South-East Area and South-West, while it increased in Siem Reap and the Central Area.

For the choice of currency in savings, the dynamics seem to differ by method of saving (Figure 2.12). The ratio of foreign currency in savings decreased for saving at Banks/MFIs; however, it increased for saving at home. Overall, the ratio slightly decreased from 30.3% to 28.4%. By areas, the ratio of foreign currency decreased, except in the Central and South-East Areas, where the ratio increased.

Currency choice in household debt also presents changes between 2014 and 2017 (Figure 2.13). Loans in Phnom Penh were still fully dollarized in 2017, and in many other regions there was an increase of the proportion of foreign denominated loans. Overall, the proportion of foreign-denominated loans increased from 67.7% to 74.1%.

2.5 Conclusions

The objective of this chapter was to investigate foreign currency use in income, expenditure, saving, and borrowing patterns among households across different regions in Cambodia. In addition, it also investigated the changes

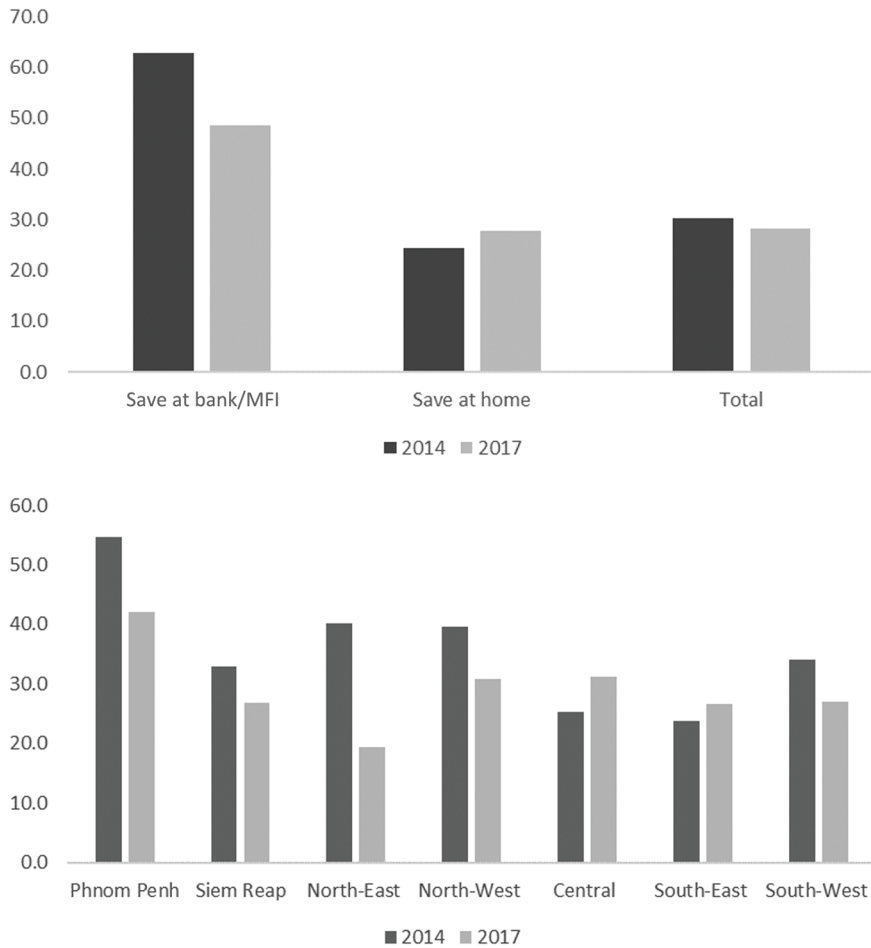


Figure 2.12 Share of foreign currencies in savings by saving method (upper panel) and region (lower panel) in 2014 and 2017

in household behavior between 2014 and 2017. We found that wage/salary income remains highly dollarized compared with other sources of income. The Thai Baht also has a significant place in the agricultural sector, especially in the North-West Area, close to the Thai border. If we compare the 2017 results with those of 2014, we observe an improvement in local currency promotion, although the changes differ across regions, income level, and sectors. We also found that many households face a currency mismatch between income and expenditure, implying that those households must exchange their income frequently from US dollars to KHR, or KHR to US dollars. Thus, firms should encourage firms to increasingly pay their workers in KHR—especially in the

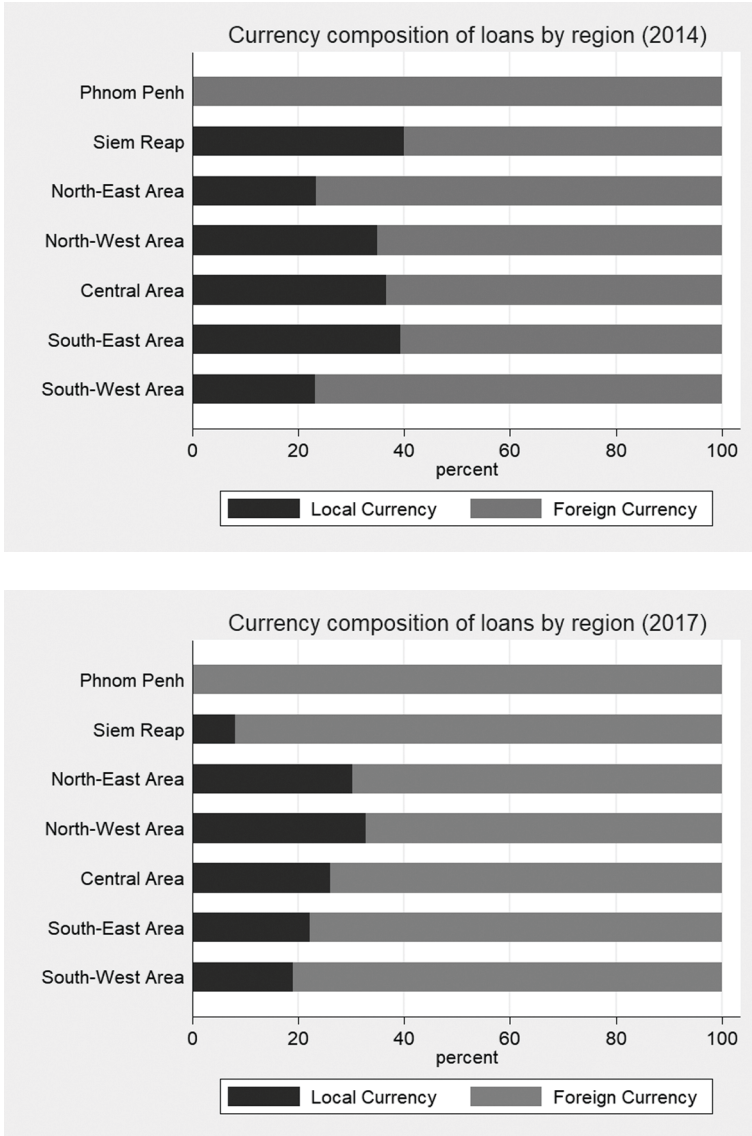


Figure 2.13 Share of currencies in loans (headcounts) by areas in 2014 and 2017

garment industry, which is strongly dollarized, because many garment workers spend in KHR.

Looking at savings, households still prefer to save in cash at home rather than to save with banks/MFIs. This pattern requires further analysis to see what the barriers to formal savings are. In terms of head count, saving in KHR

was more popular than in US dollars, but in terms of amounts, saving in US dollars were higher than in KHR, which is the same pattern as that observed in 2014. However, for future savings, if gold is available then many choose households prefer to save in gold than in KHR or US dollars. This shows that administrative measures promoting de-dollarization are not yet a good policy and will not be until their preference for and confidence in KHR are strong and high enough. To promote the use of KHR, it will therefore be a good strategy to promote financial inclusion by encouraging banks/MFI to provide more financial services in KHR, and to inform households in rural areas of the benefits of saving their cash in a financial institution.

In contrast to the savings situation, US dollars remain a more popular choice for borrowing than KHR, and the proportion of foreign-denominated loans increased from 68% to 74%. This result might reflect the fact that microfinance institutions increased the US dollar loans in their portfolio during this period (see Chapter 4). However, the NBC announced implementation of the policy, which requires all financial institutions to have at least 10% of their loan portfolio in KHR by the end of 2019. Thus, we expect that local currency loans will increase in the coming years. In terms of currency mismatches between income and borrowing, we found that those with a higher level of financial literacy tended to be more aware of exchange rate risks (Box 2.2). Thus, the promotion of public awareness of the usefulness of the use of KHR, and training in financial literacy, especially among those with low level of education, remains necessary.

Acknowledgment

We acknowledge the assistance of Lilian Muasa, a research assistant at JICA Ogata Sadako Research Institute for Peace and Development, in data cleaning and calculation.

Notes

1 Dollarization is generally categorized into three dimensions: financial dollarization, real dollarization, and transaction dollarization.
2 Data are from the publication *Monetary and Financial Statistics Data*, available on the website of the National Bank of Cambodia.
3 Chathol (2021) reports on one of the recent studies to use micro-data to study Cambodian dollarization. He investigates the situation of real dollarization by interviewing enterprises and households in Phnom Penh and found that US dollars are dominantly used in Phnom Penh, while the KHR currency is still preferred by local people and used for storage of values, means of payment, and unit of account.
4 Odajima and Aiba (2019) also described the Cambodian dollarization using the data of the NBC-JICA survey 2014.
5 According to Fidrmuc, Hake and Stix (2013), stated preference may have an advantage over realized choice. The realized choice is the outcome after negotiation with

sellers/buyers during a transaction. Thus, the realized choice could also reflect the decision by the supply side, causing an endogeneity problem in statistical inference. However, the stated choice could eliminate such issues, and detangle the determinants of the preference of suppliers/buyers from those of households.

6 It could also depend on how common the prices of the items are tagged/quoted in the market, whether in KHR or foreign exchange currencies. For instance, the prices of livestock/meat and other food/food ingredients are usually tagged in KHR per unit. Inventory and fertilizer for small businesses and farming are also commonly quoted in KHR. When the households want to sell, they will tend to quote the price in the same way in the market as it is easier to compare the value/determine the price to sell as this currency serves as a unit of measure.

7 As a result, 867 households in the data of 2014 (38.1%) were dropped from the analysis.

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Appendix 2.1: Description of the NBC-JICA Survey 2017

The first survey on the dollarization of households in Cambodia was conducted in 2014. The main aim of that survey was to investigate currency choices and usage in terms of income, expenditure, saving, and borrowing. A sample of 2,273 households was collected by using stratified sampling at the provincial level in accordance with the General Census of 2008, which enumerated the households in Cambodia from all 25 provinces and the capital. Respondents were selected from each province, districts and commune based on their location and representativeness. The authors also deliberately selected district/communes that were close to the border for those provinces bordering Thailand and Vietnam to observe the use of other foreign currencies (Thai Baht and Vietnamese Dong) besides the US dollar. Regarding the classification of urban and rural communes/villages, this was based on the classification by the National Institute of Statistics. Next, to examine the possibly different levels of dollarization at the regional level, the authors divided the sample into seven regions: (1) Phnom Penh; (2) Siem Reap; (3) Northeast Area; (4) Northwest Area; (5) Central Area; (6) Southeast Area; and (7) Southwest Area.[1]

The second survey on dollarization of households in Cambodia was conducted in 2017 to follow up on the evolution of household behavior from the time of the first survey. This required the authors to revisit the households from the first survey. This was understandably challenging given that some households were not available in the second round. We needed to replace these with a new household sample. Table A2.1 presents the number of replacements, while Tables A2.2 and A2.3 present the reasons why the same respondents or households could not always be re-interviewed in the second survey.

Table A2.1 Number of replacement samples

Sample:	*Frequency*	*Percent*
Same household, same respondent	1,130	49.71
Same household, new respondent	276	12.14
New household sample	867	38.14
Total	2,273	100.00

Table A2.2 Reasons why samples were replaced (same household but new respondents)

Reasons why new respondents	*Frequency*	*Percent*
Physically unavailable	273	99
Other reasons	3	1
Total	276	100

Table A2.3 Reasons why samples were replaced (new household sample)

Reasons why new household sample	*Frequency*	*Percent*
Household moved outside the selected commune	108	12.46
Could not contact/Could not locate	444	51.21
Physically unavailable	266	30.68
Other reasons	49	5.65
Total	867	100

Around 38% of our sample consists of new households. The main reason is related to the fact that the survey team could not reach the respondents from the first survey through the given phone number or were not able to find the respondent's household, meaning that the respondent could not be located. Another reason was that the households were physically unavailable or had moved outside the selected commune.

We divided our sample size into seven regions because the level of dollarization can substantially vary across different regions (Table A2.4). Indeed, Phnom Penh, the capital, and Siem Reap, the famous historical province, are the most developed areas in Cambodia, and thus people living in these two cities may receive a lot of US dollars from foreign direct investment and foreign tourists. Other provinces were grouped into different regions according to their geographical locations near the neighboring countries (Thailand, Vietnam, or Laos) or in the central part of Cambodia, because it is possible that Cambodians living near the frontier may also conduct transactions in other currencies besides Khmer Riels and US dollars, such as the Thai Baht or Vietnamese Dong.

Table A2.4 Sample size by region and province

Region	*Province*	*Sample size for HH–urban and rural*		
		Urban (53%)	*Rural (47%)*	*Total (100%)*
Phnom Penh		78	72	**150**
Siem Reap		64	56	**120**
The North-East Area	Kratie	31	29	**60**
	Modul Kiri	31	29	**60**
	Ratanak Kiri	31	29	**60**
	Stung Treng	31	29	**60**
The North-West Area	Banteay Meanchey	59	61	**120**
	Otdar Meanchey	27	23	**50**
	Preah Vihear	27	23	**50**
South-East Area	Kampot	54	45	**99**
	Kep	31	29	**60**
	Prey Veng	71	62	**133**
	Svay Rieng	46	36	**82**
	Takeo	61	46	**107**
	Tboung Khmum	55	46	**101**
South-West Area	Koh Kong	31	29	**60**
	Preah Sihanouk	31	29	**60**
	Pursat	37	33	**70**
	Battambang	76	68	**144**
	Pailin	29	25	**54**
Central Area	Kandal	78	74	**152**
	Kampong Cham	53	47	**100**
	Kampong Chhnang	52	42	**94**
	Kampong Speu	65	56	**121**
	Kampong Thom	56	50	**106**
Total		1,205	1,068	**2,273**

Note

1 The Northeast Area includes Kratie, Modul Kiri, Ratanak Kiri, and Stung Treng; the Northwest Area includes Banteay Meanchey, Otdar Meanchey, and Preah Vihear; the Central Area includes Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, and Kandal; the Southeast Area includes Kampot, Kep, Prey Veng, Svay Rieng, Takeo, and Tboung Khmum; and the Southwest Area includes Koh Kong, Preah Sihanouk, Pursat, Battambang, and Pailin.

3 Enterprise and Dollarization

Sok Heng Lay and Daiju Aiba

3.1 Introduction

Since the early 1990s, when there was a substantial inflow of US dollars into Cambodia in the form of official development assistance (ODA) and foreign aid, the process of dollarization has been intense. The existing literature on dollarization in Cambodia (e.g., Kang 2005; Menon 2008) tends to center on the phenomenon at the macro level. In contrast, there are few studies on the scale and coverage of dollarization in Cambodia at the micro level, and in particular few with a focus on enterprises. In this chapter, the situation of dollarization in Cambodian firms is investigated mainly using data from a large-scale survey undertaken in 2017. The survey was carried out by the National Bank of Cambodia (NBC) and the Japan International Corporation Agency (JICA) in an effort to reveal the extent of dollarization throughout the country.

This chapter further investigates the dynamics involved in the extent of dollarization between 2014 and 2017. We construct panel data by combining the second-round survey with the first-round survey. The first-round survey was carried out in 2014 and the second round was undertaken in 2017 as part of the NBC-JICA research project. The second-round survey set out to track the same enterprises that were surveyed in the first round, so as to construct panel data. As a result, we successfully tracked 535 firms out of the 856 firms from the first-round survey.

Empirical analysis of dollarization of Cambodian enterprises was documented by Aiba and Tha (2017) using data from the first-round survey of NBC-JICA. It revealed that dollarization in Cambodian firms is intense, compared with Cambodian households. This chapter investigates the extent of dollarization in enterprises, and also the progress of local currency promotion, using the data from the second-round NBC-JICA survey in 2017. We find that there are positive indications that the use of the Khmer Riel (KHR) has gradually been increasing in Cambodian enterprises over the past few years. By tracking the data from the same firms in 2014 and 2017, we find that the share of KHR in those firms' revenues and expenditures has increased. Furthermore, we find that most enterprises borrowed from commercial banks in US dollars between 2014 and 2017, while only a few firms borrowed in KHR from commercial banks.

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However, there are still several challenges to the promotion of KHR use among Cambodian enterprises, such as the underdevelopment of the KHR loan market, the lack of accounting tools in KHR, and a general lack of management know-how. Future policy measures should address these issues to further the promotion of KHR usage. This chapter is organized as follows: section 3.2 describes the dollarization of the Cambodian enterprises from the point of view of regional differences and operational size; section 3.3 discusses the currency choice in wage payments and analyzes the determinants of wage payments; section 3.4 discusses borrowing behavior and dollarization; and section 3.5 presents our conclusions.

3.2 Dollarization in Enterprises

3.2.1 Difference by Regions

We describe the situation of dollarization in Cambodian enterprises using the data collected through the NBC-JICA survey 2017.[1] First, we describe the difference in dollarization across regions. To do so, provinces are grouped into seven regions, the North-West Area, North-East Area, Central Area, South-West Area, South-East Area, Phnom Penh and Siem Reap.[2] Figure 3.1 shows the average composition of currencies, including local and foreign currencies, in terms of revenue and expenditure of firms, across the regions nationwide. Panel A presents the share of currencies in the revenue of firms and Panel B shows the patterns of currencies in expenditure. In general, the shares of foreign currencies in expenditure are higher than those of the revenue. The trend is unchanged compared with the results of the first survey, as reported in Aiba and Tha (2017). We observe that US dollars are predominant in Phnom Penh and Siem Reap for both revenue and expenditure.

As shown in Panel A of Figure 3.1, the share of foreign currencies in revenue is high in Phnom Penh, Siem Reap and the North-West Area. The share of US dollars is the highest, especially in Phnom Penh and Siem Reap; however, the THB remains the second currency used in revenue after KHR in the North-West Area. Compared with the first survey reported in Aiba and Tha (2017), it can be observed that the share of the KHR in revenue has increased in the North-West Area, while that of the THB has declined. The composition of foreign currencies in expenditure is predominant mainly in four areas: Phnom Penh, Siem Reap, the North-West Area, and the South-West Area. Similar to the currency of composition of revenue, the US dollar remains dominant in Phnom Penh and Siem Reap. However, in the North-West Area, which is bordered by Thailand, the THB is present more in expenditure than in revenue, which reflects trading activities with Thailand. However, there is no change in the share of local currency in expenditure in the North-West Area when both surveys are compared.

In terms of revenue, the local currency remains dominant in the North-East, Central, South-West, and South-East Areas; however, in terms of expenditure,

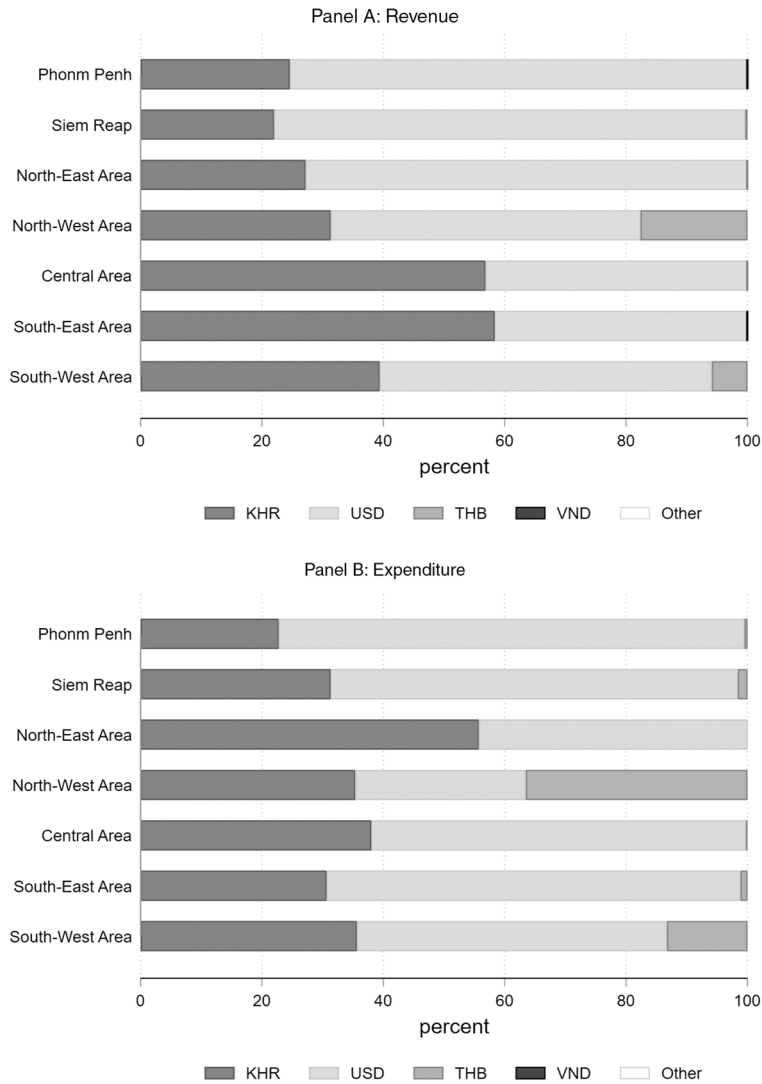

Figure 3.1 Shares of foreign currencies in revenue and expenditure by region

the local currency is predominant only in the North-East Area. Foreign currencies tend to present more in expenditure than in revenue (Table 3.1) and the trend is similar to that of the first survey. Figure 3.2 and Figure 3.3 visualize the extent of dollarization geographically. Each province is characterized into low, middle, and high in terms of the extent of dollarization in revenue and expenditure, respectively. We find that there is an improvement in local currency promotion between 2014 and 2017. The extent of dollarization

Table 3.1 Average shares of foreign currencies in revenues and expenditures

Areas	*Revenues (%)*	*Expenditures (%)*
Phnom Penh	66	69
Siem Reap	64	66
North-West Area	54	76
North-East Area	29	42
Central Area	35	53
South-West Area	46	66
South-East Area	35	58

Source: The NBC-JICA Survey 2017. Authors' calculation.

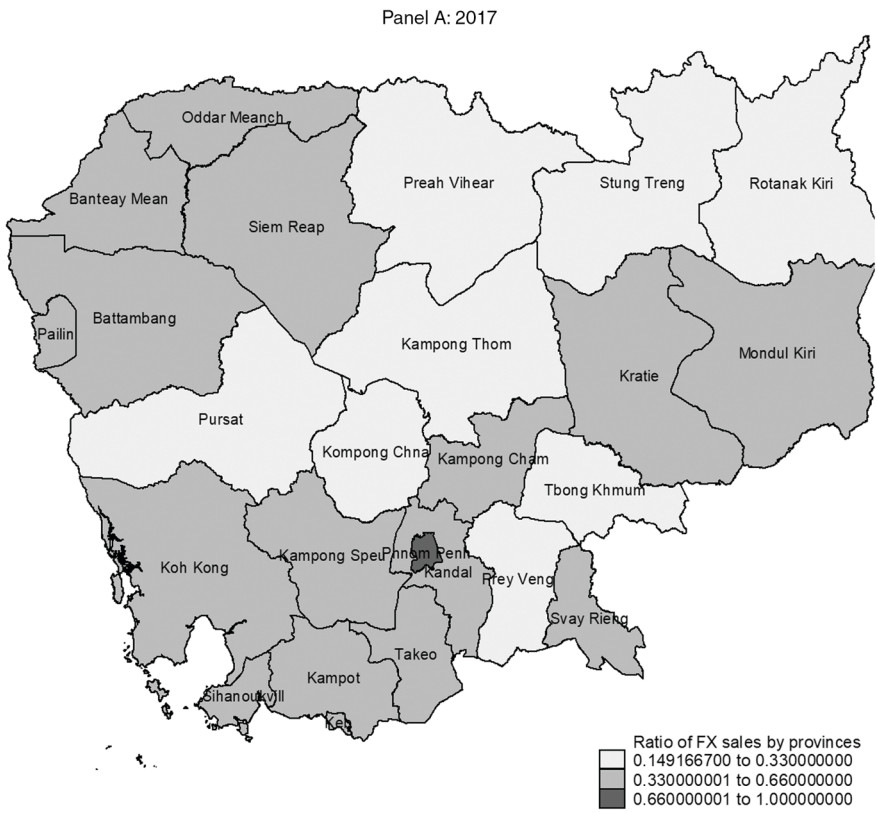

Figure 3.2 Levels of revenue dollarization by provinces in 2014 and 2017

Source: The NBC-JICA Survey 2014 and 2017. Authors' calculation.

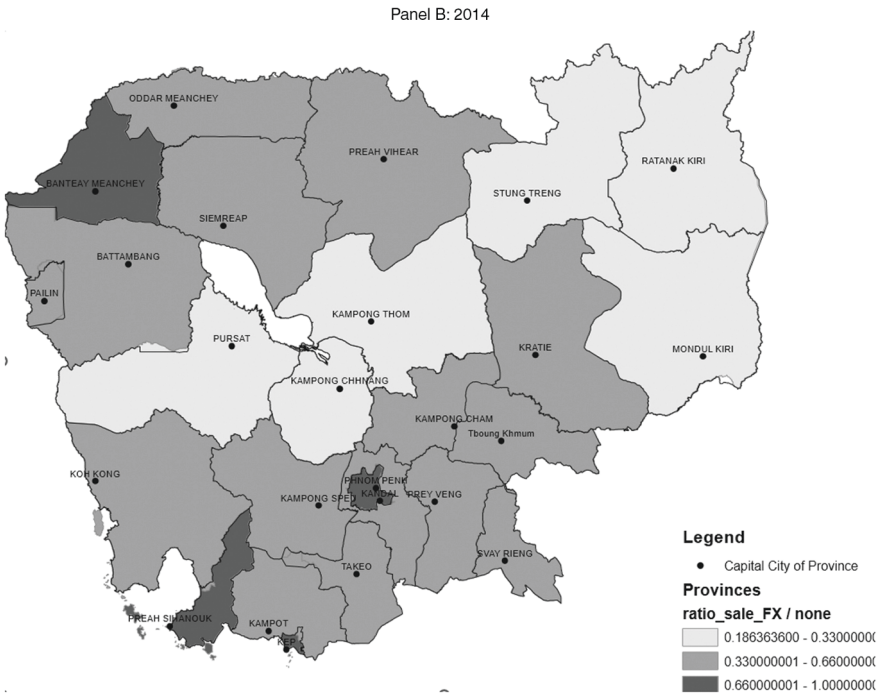

Figure 3.2 (Continued)

seemed to be high, especially in border areas with Thailand and with Vietnam, and Preah Sihanouk as a result of import and export activities. However, the extent of dollarization was lower in 2017 than in 2014. Some areas of "high" in 2014 became "middle" in 2017, and some areas of "middle" became "low" as well. These improvements are particularly observed in border areas and Preah Sihanouk.

Table 3.2 describes the price-setting behavior of enterprises across seven regions. It can be seen that most enterprises set the prices of their goods and services only in US dollars, only in KHR, or in both currencies, while price setting in VND is rare. This behavior among enterprises was also observed in the first survey. Enterprises in Phnom Penh and Siem Reap tend to set prices either in US dollars or in both US dollars and KHR, largely due to the fact that the two locations are top tourist destinations. Price setting in THB is also observed in the North-West and South-West Areas, reflecting the use of THB as the medium of exchange for cross-border trade between Cambodia and Thailand. As in the first survey, we observe the important role of the Riel in price-setting among enterprises in areas such as Central, South-East, South-West, and North-East Cambodia. Interestingly, we also observe the increasing role of the Riel in price

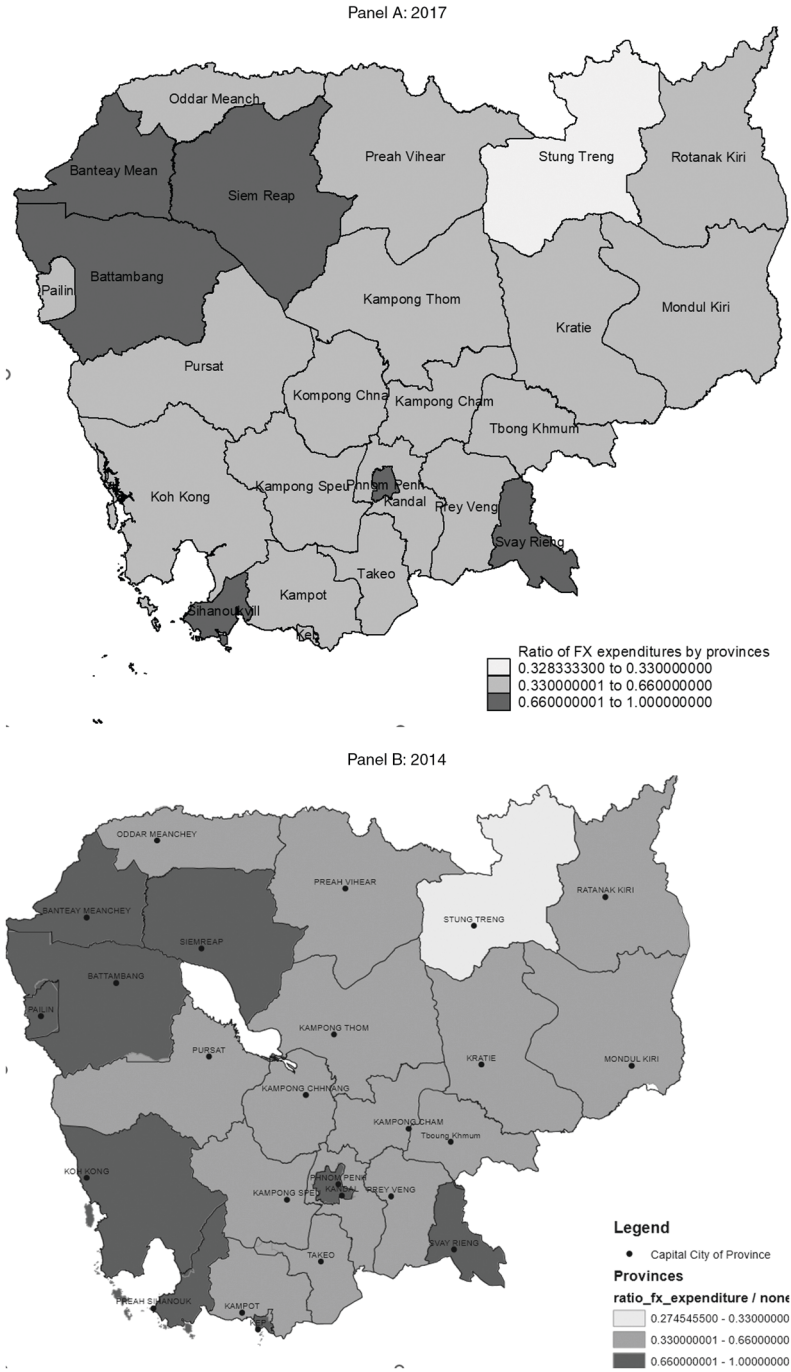

Figure 3.3 Levels of expenditure dollarization by provinces in 2014 and 2017

Source: The NBC-JICA Survey 2017. Authors' calculation.

Table 3.2 Price quotations in each currency composition by region

Quotation	*Phnom Penh*	*Siem Riep*	*North-west*	*North-east*	*Central*	*South-west*	*South-east*
KHR only	8	11	14	22	58	28	55
USD only	100	27	10	10	38	31	33
THB only	-	-	9	-	-	5	-
VND only	-	-	-	1	1	-	2
KHR & USD	74	22	14	16	92	56	85
USD & THB	-	1	9	-	-	8	-
KHR & THB	-	-	8	-	-	8	-
USD & VND	-	-	-	-	-	-	2
KHR & VND	-	-	-	1	1	-	-
THB & VND	-	-	-	-	-	-	-
Total number of firms	182	61	64	50	190	136	177
Number of firms using KHR	82	33	36	38	150	92	140
Number of firms using USD	174	50	33	26	130	95	120
Number of firms using THB	-	1	26	-	-	21	
Number of firms using VND	-	-	-	1	-	-	4

Note: Figure in each cell is the number of responses.

Source: The NBC-JICA Survey 2017. Authors' calculation.

setting in the North-West Area. Overall, we do not observe any significant price-setting behavior among enterprises between the two surveys.

3.2.2 Difference by Sectors

Next, the difference in dollarization by industrial sectors of Cambodian enterprises is described. To examine the scale of dollarization across industries, the International Standard Industry Classification revision 4 (ISIC Rev. 4)[3] was used to classify enterprises into five main sectors: agriculture, manufacturing, wholesale and retail trades, tourism, and others. It is important to note that there are only five observations for the agricultural industry, so it is difficult to draw conclusions about dollarization in this sector.

As shown in Panels A and B of Figure 3.4, the use of foreign currencies in expenditure is generally higher than in revenue. For the currency composition of revenue, foreign currencies are dominant in agriculture, tourism, and other sectors, while in terms of expenditure, foreign currencies are dominant in wholesale and retail trades and other sectors. For the manufacturing industry, the US dollar dominates foreign currency composition in both revenue and expenditure followed by THB. The pattern is similar to that shown in the first survey. The wholesale and retail trade sector shows a different pattern of dollarization in both revenue and expenditure. We observe that the US dollar, THB, and VND are present in revenue and expenditure, but the shares of THB and VND are small. The pattern does not deviate markedly from that found in the first survey.

High dollarization in both revenue and expenditure is observed in the tourism industry in a similar way to the first survey. The average shares of foreign exchange currency in revenue and expenditure are 55% and 50%, respectively (Table 3.3). Like the first survey, the US dollar predominates over the other two currencies, namely THB and VND, in both revenue and expenditure (Panel A and Panel B of Figure 3.4). Enterprises usually acquire revenues (sales) in foreign currency, particularly the US dollar, when offering accommodation and recreation services since a large pool of their service users are international tourists. High dollarization in both revenue and expenditure in other sectors is also evident, with the average shares of foreign currency in

Table 3.3 Average of shares of foreign currencies by sectors

Sectors	*Revenues (%)*	*Expenditures (%)*
Agriculture	56	42
Manufacturing	44	54
Wholesale and retail trade	40	70
Tourism	55	50
Others	62	61

Source: The NBC-JICA Survey 2017. Authors' calculation.

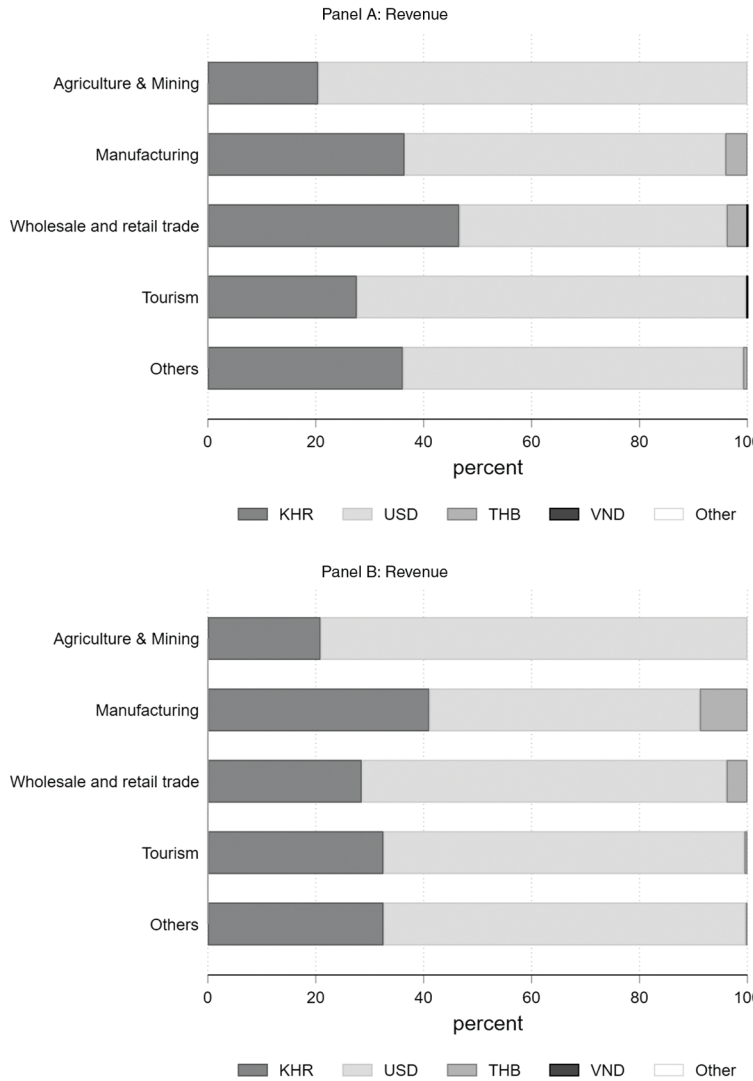

Figure 3.4 Shares of foreign currencies in revenue and expenditure by sector

revenue and expenditure being 62% and 61%, respectively. This pattern was also observed in the first survey.

Based on Table 3.4, which shows the price-setting behavior of enterprises by sector, enterprises setting the prices of their goods and services only in US dollars, only in KHR, or in both currencies are observed in almost all sectors. In terms of the price in a single currency, enterprises in the wholesale and retail trades sector prefer pricing in KHR; however, most enterprises in this

Table 3.4 Price quotations in each currency composition by sector

Quotation	*Agriculture*	*Manufacturing*	*Trades*	*Tourism*	*Others*
KHR only	1	56	97	28	14
USD only	1	31	69	104	44
THB only	-	8	5	-	1
VND only	-	-	2	1	1
KHR & USD	3	37	220	76	23
USD & THB	-	1	9	-	-
KHR & THB	-	9	6	1	-
USD & VND	-	-	-	1	1
KHR & VND	-	-	2	-	-
THB & VND	-	-	-	-	-
Total number of firms	5	142	410	211	84
Number of firms using KHR	4	102	325	105	37
Number of firms using USD	1	69	298	181	68
Number of firms using THB	-	18	20	1	1
Number of firms using VND	-	-	4	3	3

Note: The figure in each cell is the number of responses.
Source: The NBC-JICA Survey 2017. Authors' calculation.

sector also price in both KHR and US dollars. In contrast to the rest of the sectors, the pricing behavior of enterprises in the tourism sector is dominated by the US dollar, while pricing in other currencies such as THB or VND has been rare.

3.2.3 Differences by Size of Enterprise

Figure 3.5 shows the composition of foreign currency by the size of enterprises (micro, small, medium-sized, and large). In general, we observe that the share of foreign currencies in revenue is mainly for large enterprises, while those in expenditure are mainly for micro, small, medium, and large enterprises (Panels A and B). The revenue in foreign currencies of larger enterprises tends to be higher than that of smaller enterprises, and the pattern is similar to that in the first survey. The US dollar makes up the largest share of foreign currencies in both revenue and expenditure, followed by a much smaller proportion of THB and VND.

For the share of foreign currencies in expenditure, the majority of enterprises show a larger share of foreign currencies, suggesting that dollarization in expenditure is higher than that in revenue (Panel B). Nevertheless, it is important to note that there are variations in levels of foreign currency use within each group of firms, which indicates that firm size is not a single driving factor in dollarization. The variation of the average shares of foreign

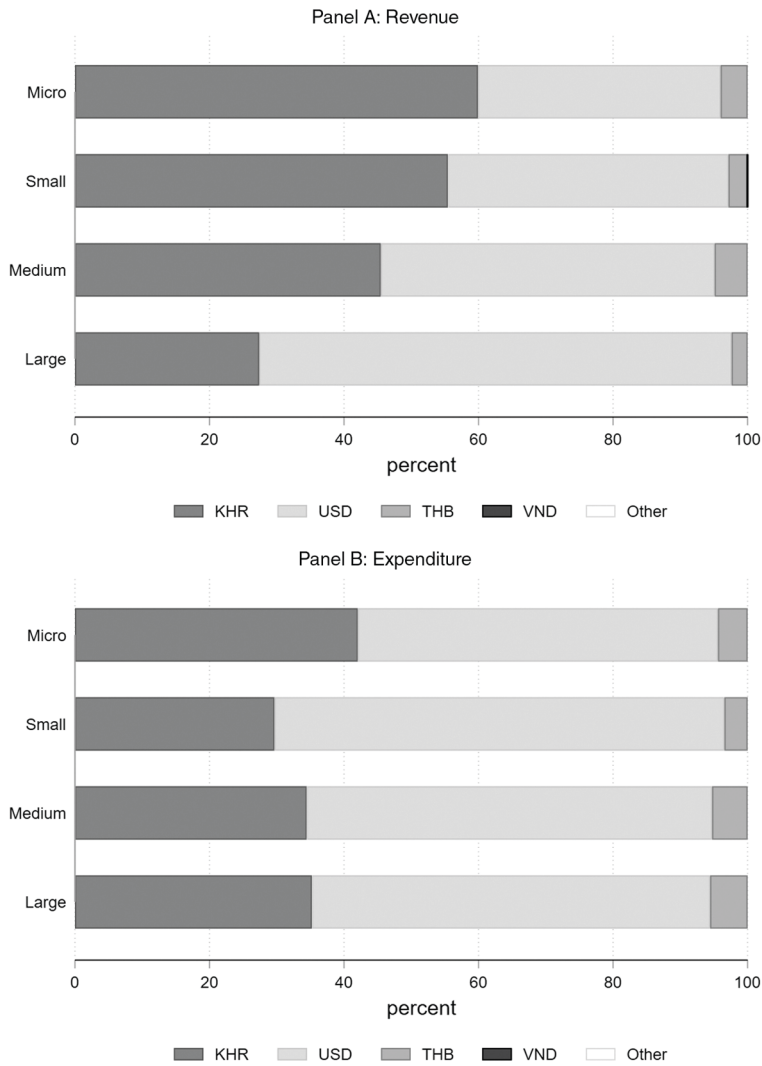

Figure 3.5 Shares of foreign currencies in revenue and expenditure by enterprise size

currency in revenue and expenditure is mostly in micro, small, and medium-sized enterprises; however, there is not much variation of average shares of foreign currency in large enterprises (Table 3.5).

Similar to the pricing behavior of enterprises by region and sector, the KHR and the US dollar are the two main currencies set by enterprises, regardless of size. Table 3.6 shows that the KHR tends to be the preferred currency by micro and small-sized enterprises when setting prices, while the US dollar tends to be the main currency for prices for medium and large enterprises. In

Table 3.5 Average of shares of foreign currencies by firm size

Enterprise size	*Revenues (%)*	*Expenditures (%)*
Micro	37	54
Small	41	65
Medium	48	62
Large	65	64

Source: The NBC-JICA Survey 2017. Authors' calculation.

Table 3.6 Price quotations in each currency composition by enterprise size

Quotation	*Micro*	*Small*	*Medium*	*Large*
KHR only	71	70	31	24
USD only	38	68	48	95
THB only	1	2	5	6
VND only	-	1	1	2
KHR & USD	79	137	70	73
USD & THB	-	8	5	5
KHR & THB	5	3	4	4
USD & VND	-	-	-	2
KHR & VND	-	1	2	-
THB & VND	-	-	-	-
Total number of firms	194	290	166	211
Number of firms using KHR	155	211	107	101
Number of firms using USD	117	213	123	175
Number of firms using THB	6	13	14	15
Number of firms using VND	-	2	3	4

Note: The figure in each cell is the number of responses.

Source: The NBC-JICA Survey 2017. Authors' calculation.

terms of pricing in dual currency–the KHR and the USD–small enterprises tend to have a high frequency, while the micro, small and large enterprises tend to have moderate and similar frequencies. THB tends to be the third currency after the KHR and the USD in terms of pricing, while the use of the VND is relatively low.

To understand why enterprises set prices in KHR only, US dollars only, or in both currencies, we posed a number of questions specifically aimed at capturing this aspect. Figure 3.6 presents the reasons for price setting in KHR, US dollars, or a combination of both. Panel A shows that enterprises set prices in KHR for three main reasons: raw materials are purchased in KHR; customers prefer using KHR as their medium of payment; and it is convenient for enterprises when measuring the price of their products and services. Between the first and second surveys, we observe a remarkable increase in the response of enterprises to setting prices in local currency for the sake of convenience in

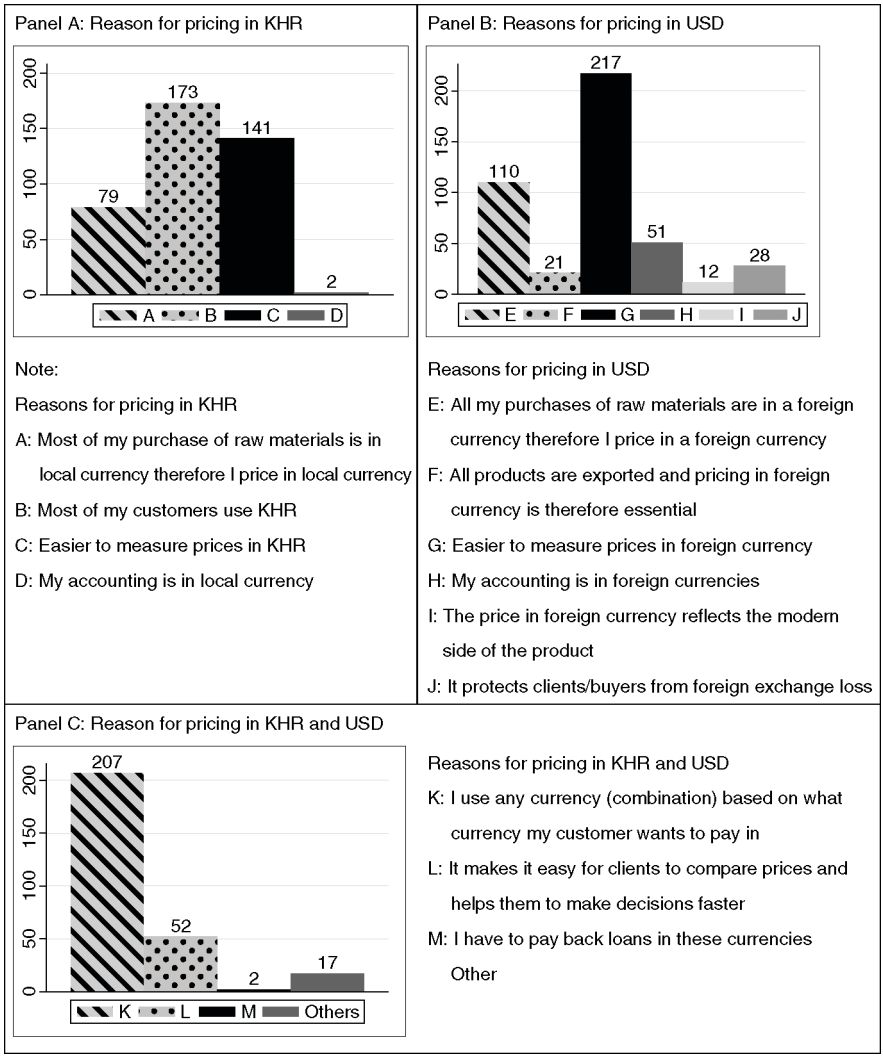

Figure 3.6 Reasons for pricing the currency

price measurement. There was also a meager rise in KHR price quotations in response to customer preference for using KHR as the medium of payment. An increase in the number of enterprises that set their prices in KHR based on their purchase of raw materials in KHR was also observed.

Panel B shows the reasons why enterprises set their prices in US dollars only. The three main reasons for enterprises doing so are: convenience when measuring prices; making it easier to purchase raw materials in a foreign currency;

and the option of using foreign currency accounting systems. Comparing the results of the second survey with those of the first survey, we do not observe any change except for a substantial increase in the number of firms that set their prices in US dollars to match accounting systems (an increase from 27 firms in the first survey to 51 firms in the second).

Panel C indicates the reasons why enterprises set their prices in both KHR and US dollars. There are two main reasons why firms adopt both KHR and US dollar price quotations: alignment with the preference of customers for one currency or the other; and making alternative currency choices available as a price comparison for customers. In addition, there is also the question of the perception of the enterprise if pricing of goods and services has to be conducted in KHR. Similar to the results shown in the first survey, we see that only 20 enterprises do not accept pricing in KHR, while 70% of all firms accept it completely; this is a positive sign for the promotion of local currency.

3.3 Determinants of Wage Payment in Foreign Currencies

The choice of currencies in salary/wage payment is not specified in any law or regulation in Cambodia. Practically, salaries are paid in local currency for civil servants of the government ministries and other public institutions, while employees of private firms and enterprises receive salaries or wages in foreign currency, mainly US dollars.[4] The use of foreign currency in salary/wage payment is one of the key elements in understanding real dollarization, which is defined by Ize and Yeyati (2003) as the extent to which prices and wages are denominated in foreign currency. In addition, currency substitution can be captured through salary payment in foreign currencies, as Siregar and Chan (2014) found that households tend to hold more foreign currencies if they receive higher portions of their salaries in foreign currencies. Therefore, the characteristics of salary/wage payment in foreign currencies in Cambodia are worth observing.

To understand the determinants of firm's salary/wage payment in foreign currencies in Cambodia, we employ a simple regression model:

$$\begin{aligned} \Upsilon_i = {} & \alpha_0 + \alpha_1 Revenue_i + \alpha_2 Size_i + \alpha_3 Sector_i + \alpha_4 Region_i + \alpha_5 \\ & Employee\ Preference_i + \alpha_6 Employee\ Preference_i + \alpha_7 \\ & Inflation_i + \alpha_7 Depreciation_i + \alpha_8 Export_i + \varepsilon_i \end{aligned} \tag{3.1}$$

where: Υ_i is a continuous variable representing what percentages of wages/salaries that firms pay in foreign currency. This variable is created based on the question in the survey which asked respondents: "Please indicate the average percentage currency in which payroll was paid in 2016." For independent variables, we include firm's revenue, size, sector, region, employees' and employer's preference, inflation expectations and exchange rate expectations. $Revenue_i$ is a variable generated from the question that asked firms to indicate

the percentage of their sales in foreign currencies. $Size_i$ comprises dummy variables for micro, small, medium, and large firms, while the comparison or benchmark group refers to micro firms. $Sector_i$ comprises dummy variable for firms classified in agriculture, manufacturing, wholesale and retail trades, tourism, and other sectors, while firms classified in manufacturing are the benchmark group. $Region_i$ takes the value of one if firms are located in main cities such as Phnom Penh and Siem Reap; otherwise, it takes zero.

Employee Preference$_i$ and *Employee Preference*$_i$ are dummy variables respectively showing the preference of the employees and employers toward using foreign currency. The survey asked about the reasons why firms pay employees in the chosen currency. In the answers, there are the employee-side factors, such as employee's preference, position, and nationality, while there are the employer-side factors, such as accounting system, payroll account, contract, affecting the currency choice of remunerating employees. $Employee_i$ takes one if respondents answered any of the reason relating to the employee side, and $Employer_i$ takes the value of one if respondents answered any of the reason relating to the employer side factors.

$Inflation_i$ and $Depreciation_i$ are expectations on the change in inflation and exchange rate, respectively. To measure the inflation expectation, we create a dummy variable based on the survey question, "Compared to the last six months, in your view, how will prices move in the next six months?" The value of inflation expectation is 1 if the respondent responds that the prices will rise more sharply than in the past, rise at the same pace as before, or rise more moderately than before; and 0 if otherwise. Similarly, the exchange rate expectation is measured based on the respondent's perception of the depreciation of the KHR against the US dollar based on the survey question, "How do you think the exchange rate of your local currency will develop against the US dollar over the following period?" The dummy variable of depreciation is 1 if the respondent expects that the KHR/US dollar exchange rate will be between 4,100 and 4,200 or 4,200 and above; and 0 otherwise for the next six months. $Export_i$ is a dummy variable representing firms that have products or services exported overseas. The dummy variable of export is 1 if the firms have products or services exported overseas and zero otherwise.

The econometric model takes the form of ordinary least squares (OLS) on equation (3.1) above. Our primary interest is to estimate the coefficients (α) for all independent variables to understand determinants of firm's salary/wage payment in foreign currencies. Table 3.7 provides summary statistics of dependent and independent variables included in the estimation. Table 3.8 shows the results of estimating equation (3.1) in different sample. Column 1 shows the results of the full sample survey, while columns 2–5 present the OLS results taking into account the different firm's sizes, namely micro, small, medium and large firms.

In column 1 of Table 3.8, the effect of revenue in foreign currency is seen as positive and statistically significant, suggesting that firm's revenue in foreign currency does affect its decision to pay wages in a foreign currency. In terms of

Table 3.7 Summary statistics

	N. Obs	*Mean*	*SD*	*Min*	*Max*
Wage	703	39.820	45.39	0	100
Revenue	823	46.740	32.20	0	100
Micro (dummy)	856	0.227	0.419	0	1
Small (dummy)	856	0.338	0.473	0	1
Medium (dummy)	856	0.192	0.394	0	1
Large (dummy)	856	0.244	0.430	0	1
Agriculture (dummy)	856	0.005	0.076	0	1
Manufacturing (dummy)	856	0.169	0.375	0	1
Trades (dummy)	856	0.481	0.500	0	1
Tourisms (dummy)	856	0.246	0.431	0	1
Other sectors (dummy)	856	0.097	0.296	0	1
Main cities (dummy)	856	0.284	0.451	0	1
Employee (dummy)	856	0.492	0.500	0	1
Employer (dummy)	856	0.370	0.483	0	1
Inflation (dummy)	856	0.192	0.394	0	1
Depreciation (dummy)	856	0.072	0.259	0	1
Export (dummy)	856	0.082	0.274	0	1

Source: The NBC-JICA Survey 2017. Authors' calculation.

sectors, when using manufacturing as benchmark group we find that the agriculture and wholesale and retail trades sectors are not statistically significant, but tourism and "other" sectors positively and statistically significant at the 1% confidence level. This suggest that employees in tourism and other sectors tend to receive their wages in foreign currencies.

In terms of location, we find positive correlation between *Main cities* and wage payment in foreign currencies, given that its coefficient is positively and statistically significant. This suggests that wage payment in foreign currencies is more likely to happen in main cities such as Phnom Penh and Siem Reap compared with other regions. The result is consistent with previous finding that dollarization is mostly used in urban areas while the local currency is popular in rural areas (Kang, 2005). When taking into account employee and employer factors, our results are robust when the coefficients are positive and statistically significant. Their preference is the key factor that encourage wage payments in foreign currencies, and this mindset could be difficult to change, which is in line with the hysteresis matter described in Menon (2008). However, there is no statistical evidence to prove that inflation expectations and the future depreciation of local currency are associated with the probability of paying wages in foreign currencies. It is undeniable that Cambodia has maintained stable inflation and exchange rates over the last two decades; therefore, people and businesses can predict the likely price levels and the value of the local currency. However, the coefficient of *Export* is statistically significant and negative. This implies that exporting companies are unlikely to pay wages in foreign currencies.[5]

Table 3.8 Determinants of wage payment in foreign currencies

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
VARIABLES	*OLS*	*OLS-Micro*	*OLS-Small*	*OLS-Medium*	*OLS-Large*
Revenue	0.675***	0.661***	0.588***	0.785***	0.681***
	(0.0511)	(0.154)	(0.0910)	(0.0970)	(0.0966)
Size Dummies (Micro is baseline)					
Small	-5.245				
	(3.660)				
Medium	-2.221				
	(4.006)				
Large	-3.904				
	(3.944)				
Industry Dummies (Manufacturing is baseline)					
Agriculture	8.622		0.195		29.24
	(24.64)		(12.12)		(55.26)
Trade	1.538	-4.728	-1.590	0.229	5.051
	(3.674)	(7.873)	(6.807)	(7.520)	(9.183)
Tourism	10.70***	10.24	0.814	11.10	15.14*
	(3.706)	(9.287)	(7.522)	(7.449)	(7.828)
Other Sectors	14.51***	4.410	12.86	18.20	18.46
	(5.056)	(9.189)	(9.654)	(11.68)	(11.42)
Main cities	24.70***	31.20***	32.61***	12.80**	24.64***
	(3.314)	(9.760)	(6.385)	(6.401)	(5.525)
Employee preference	10.62***	13.63**	11.51***	8.734	8.151

(*Continued*)

Table 3.8 (Continued)

	(1)	*(2)*	*(3)*	*(4)*	*(5)*
VARIABLES	*OLS*	*OLS-Micro*	*OLS-Small*	*OLS-Medium*	*OLS-Large*
	(2.567)	(6.442)	(4.318)	(5.770)	(5.124)
Employer preference	12.83***	5.455	14.70***	12.51**	10.70**
	(2.677)	(6.699)	(4.725)	(6.042)	(5.043)
Inflation expectation	0.160	-4.791	4.992	-6.592	
	(3.787)	(8.853)	(4.767)	(8.249)	
Depreciation expectation	-3.516	13.00	-4.642	-4.647	
	(4.744)	(11.42)	(6.395)	(9.846)	
Export	-12.26**	-5.159	-21.66*	0.312	-13.82
	(5.182)	(6.269)	(11.85)	(11.34)	(9.538)
Constant	-14.33***	-10.91*	-15.83**	-15.44***	-18.45***
	(3.676)	(5.949)	(6.442)	(5.720)	(5.994)
Observations	677	93	237	154	193
R-squared	0.544	0.668	0.503	0.499	0.562

Note: The asterisks ***, ** and, * represent significance levels, 1 percent, 5 percent, and 10 percent, respectively. Standard errors are presented in parentheses.
Source: The NBC-JICA Survey 2017. Authors' calculation.

Interestingly, we could not find any statistical evidence to support the idea that firm sizes (small, medium, and large dummies) determine the use of foreign currencies for paying wages or salaries (Column 1). However, firm sizes seem to be associated with the negotiation power between employees and employers regarding currency choice in payment. Columns 2–5 present the results of the determinants of wage payment in foreign currencies for different firm sizes, namely micro, small, medium and large firms, respectively. Similar to the estimations from the full sample, the effect of revenue in foreign currencies is positive and statistically significant at 1%, suggesting that firms' revenue in foreign currency does affect their decision to pay wages to employee in foreign currency for all the size categories. However, statistical significance and estimated size of coefficient varied from smaller-sized to larger-sized firms for *Employee*, and *Employer preference*. In particular, *Employee preference* was significant and the estimated coefficient was larger for firms of smaller size. In the meantime, *Employer preference* is not statistically significant in micro-sized firms, but it is in small, medium, and large firms. This implies that currency choice is dependent on employee preference, but the influence of employee preferences becomes smaller as firm size becomes larger.

3.4 The Borrowing Behavior of Cambodian Enterprises

This section describes the borrowing behavior of enterprises and their choice of borrowing currencies using the data from the NBC-JICA 2017 survey. As shown by Aiba and Tha (2017), enterprises choose to use multiple currencies, namely KHR, USD, THB, and VND, for their financial operations in Cambodia. It is therefore likely that enterprises engage in exchange rate risk hedging. For instance, experience in other developing dollarized economies shows that firms with foreign exchange incomes tend to borrow in foreign exchange currency, namely US dollars, to hedge exchange rate risk (Jeanne, 2005; Brown et al., 2011; Mora et al., 2014 cited in Aiba and Tha, 2017).

Results from the NBC-JICA 2017 survey show that out of the 856 enterprises surveyed, 225 (26%) received loans, with a number of enterprises receiving multiple loans. In total there were 251 loans reported by the surveyed enterprises. Table 3.9 shows the number of firms engaging in borrowing practices by sector, firm size, and region. Looking at the sectors, enterprises in the manufacturing sector, and in the wholesale and retail trade, are more likely to engage in borrowing, a pattern that is also evident in the first survey. Across the sectors there is evidence of a rise in loans since the first survey, and enterprises appear to have better access to bank loans, as indicated in column 5, Panel A. The average size of loan in the manufacturing sector, as shown in column 6 in the same panel, drops moderately from the first survey, while those of other sectors went up quite substantially. It should be noted that the debt to asset ratios across all sectors also went up from the first survey.

Panel B shows the borrowing behavior of enterprises in relation to their size. As expected, in the first survey small, medium, and large enterprises were

Table 3.9 Numbers/percentages of enterprises having access to loans

	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
	Having loans	*All sample*	*Percentage (= 1/2)*	*Loans/ assets*	*Bank loan/ loans*	*Average amount of loan (USD)*
Panel A: Industrial sectors						
Agriculture	1	5	20	23	100	40,000
Manufacturing	56	145	39	47	85	291,492
Wholesale and retail trade	130	412	32	53	70	70,738
Tourism	28	211	13	64	82	127,500
Others	10	83	12	53	90	173,700
Total	225	856	26			
Panel B: Size of enterprises						
Micro	40	194	21	81	63	21,068
Small	92	289	32	51	70	63,121
Medium	45	164	27	32	83	110,955
Large	48	209	23	45	94	400,111
Total	225	856	26			
Panel C: Regions						
Phnom Penh	18	182	10	83	79	107,861
Siem Reap	11	61	18	22	45	86,600
North-West Area	28	64	44	42	75	152,704
North-East Area	10	49	20	39	80	205,850
Central Area	55	189	29	67	77	110,993
South-West Area	47	136	35	46	84	204,070
South-East Area	56	175	32	47	75	101,145
Total	225	856	26			

afforded better access to loans than micro enterprises. Overall, we observe an increase in share of bank loans in total loans across enterprise sizes from the first survey as shown in column 5, Panel B. Nevertheless, the figures show that larger enterprises tend to get better access to bank loans. Similarly, the size of loans across all enterprise sizes has also increased since the first survey. This may imply that there was an expansion of the coverage of bank products or branches or increased demand for loans across the board.

Panel C shows the borrowing behavior of enterprises by region. The enterprises in Phnom Penh were less reliant on bank loans. As discussed by Aiba and Tha (2017), enterprises in Phnom Penh may rely more on trade credits from suppliers due to a better institutional environment, such as law enforcement and business networks, and higher business literacy than other regions. However, compared to the NBC-JICA survey 2014, we observe an overall increase in the share of bank loans in the total loans across all regions, except for Siem Reap; the reason for this discrepancy is not clearly known. As a whole, this suggests that given the variation in the engagement of enterprises

Table 3.10 Choice of currency by lenders

	KHR	*USD*	*THB*	*Total*
Commercial banks	4	184	2	190
Microfinance institutions	0	24	0	24
Family and friends	0	28	1	29
NGOs	0	1	0	1
Pawn shops	0	1	0	1
Other informal lenders	1	2	0	3
Material Suppliers	0	1	0	1
Total	5	241	3	249

Note: Authors' calculation using the data from the NBC-JICA 2017.

Table 3.11 Currency choices in loans in 2014 (by funding sources)

	KHR	*USD*	*Total*
Commercial banks	0	172	172
Microfinance	0	19	19
Family, friends	4	38	42
Informal lenders	2	1	3
Others	0	1	1
Total	6	263	237

Note: the source of this table is from Aiba and Tha (2017). The table is a breakdown of currency choice of borrowing by funding sources in the NBC-JICA survey 2014.

in borrowing activity across regions, factors other than location may drive borrowing behavior.

We further examine the choice of loan currency and the sources of borrowing; these results are shown in Table 3.10. Comparing results from the current survey with those of the NBC-JICA survey 2014 (Table 3.11), there is no change in the currency in which firms choose to borrow. Most firms obtained loans in US dollars, while only a few firms acquired loans in KHR and THB. Commercial banks play a critical role in providing loans in foreign exchange currency, particularly US dollars, with microfinance institutions the second most selected option followed by family and friends. In sum, firms choosing to borrow in US dollars remain a phenomenon. In addition, as also found in Okuda and Aiba (2018), most loans were taken out from commercial banks, suggesting that commercial banks are a significant funding source for Cambodian firms.

Why do Cambodian enterprises borrow in foreign exchange currency? The vast literature suggests that it is partly a consequence of risk-hedging behavior by banks (Brown et al., 2011). The majority of financial institutions collect foreign exchange currency funds from abroad (parent banks or firms) due to

cheaper funding costs. They in turn extend foreign exchange currency loans to domestic enterprises to circumvent currency risks. In addition, previous studies have found that the country-level interest rate differentials induce enterprises to choose foreign exchange currency debts that are favorable in their terms (Brown et al. 2011). If the financial market were perfect, arbitrage would adjust the demand for high-yield loans/cheaper debt currency ('interest rate parity'). Meanwhile, if there is friction in the adjustment of interest rates, this is the case. Brown et al. (2011) empirically tested this hypothesis using data from cross-country firms and they found evidence supporting this theory.

Since the majority of enterprises borrowed in foreign currencies, US dollars in particular, and shares of KHR currency in revenue and expenditure of enterprises that borrowed in 2017 were 60% and 40%, respectively, enterprises are more likely to encounter currency mismatch. This pattern was also observed in 2014, suggesting that currency mismatch in enterprises' operations remains prevalent. Our finding differs from those of previous studies in other dollarized economies, which show that firms tend to avoid currency mismatch by borrowing in foreign currencies when considerable proportion of their income and asset is in foreign currency (Aguiar, 2005; Brown et al. 2011; Mora, Neaime, and Aintablian 2013; Kamil et al. 2012, cited in Aiba and Tha 2017). This could mean the loan market in Cambodia is underdeveloped in terms of hedging the risk of currency mismatch for Cambodian enterprises. If that is so, enterprises in Cambodia are vulnerable to risk of currency mismatch between their operation and loans, and if the volatility of exchange rate—KHR/US dollars in particular—is high, this may have serious implications for investment.

The NBC-JICA survey also interviewed the reasons of borrowing in foreign currency. Figure 3.7 provides the responses to the question of why enterprises chose to borrow in a foreign currency, and why they chose to borrow in KHR. Respondents were allowed to select two alternate responses. There are three main reasons why enterprises borrow in foreign exchange currency (Panel A). The first is that the transactions involved require enterprises to pay in foreign exchange currency; the other two reasons are convenience for large amount borrowing and a requirement that enterprises borrow in foreign exchange currency. If we compare our results with those from the first survey, we observe a drop in the number of responses indicating the last two major reasons, but an increase in the number of responses pointing to the first major reason—that is, the convenience for borrowing large amounts. This may imply that there is a tendency toward borrowing in foreign exchange currency for the sake of convenience and also suggests that it may make the goal of promoting local currency harder to attain.

Additionally, it is worth noting that only 11enterprises stated that they did not want to risk exchange rate losses, which is slightly above the number of responses in the earlier survey. This may suggest that enterprises are not overly worried about exchange rate risk; therefore, they are likely to be exposed to

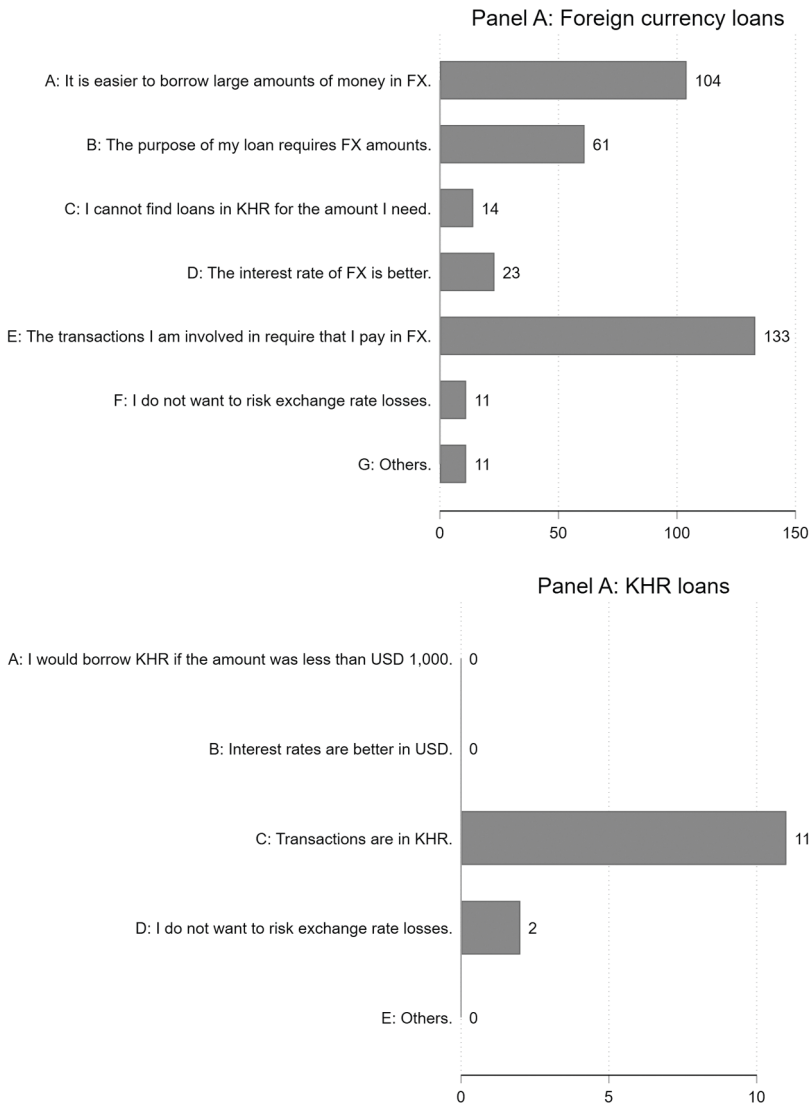

Figure 3.7 Reasons of currency choice in borrowing

the high volatility of exchange rates. This may result from the fact that the KHR/US dollar exchange rate has been stable for so long that firms tend to take exchange rate risks for granted. For loans in local currency, enterprises tend to borrow in KHR only when their business transactions are in KHR, and the number of their responses are very few.

In fact, this environment for Cambodian firms is unique even compared with other dollarized economies examined in previous studies. Cambodian firms have almost no choice of currency when borrowing, other than US dollars. Their choice of currency is not induced by deviation from interest rate parity, but presumably banks induce firms to borrow in foreign exchange currency.

Even though Cambodian firms borrow mostly in US dollars, many of them use KHR as the main currency of their operations (Table 3.12). Okuda and Aiba (2018) found that firms' capital structure decisions tend to be affected by currency risks in Cambodia. The authors found that Cambodian firms choose lower amounts of bank debt if their revenues are in the local currency. This means that firms with local currency revenues cannot hedge the risk of currency mismatch between revenue and borrowings in Cambodia, so they adjust the risks by borrowing lower amounts. Their findings suggest that dollarization distorts the firm's capital structure decisions in the sense that banks leave no hedging options for enterprises that are operating in the local currency. Therefore, the hedging purpose of currency mismatch risks might be one of the significant reasons why Cambodian firms borrow in US dollars.

Furthermore, if market imperfection hypothesis is true in Cambodia, an environment where only US dollar loans are available may impede access to finance for those firms that have local currency revenue due to currency mismatch risks. Okuda and Aiba (2018) empirically confirm that access to loan markets is affected by the currency composition of firms' revenues. This means that in highly dollarized economies with underdeveloped financial systems, such as that of Cambodia, firms with currency mismatch risks tend not to access loan markets in which US dollar loans are the only loans available. Therefore, development of a local currency loan market would allow Cambodian firms with local currency revenues to hedge their currency mismatch risks, leading to improvements in financial deepening and inclusion.

3.5 Conclusion

The extent of dollarization in the Cambodian economy remains large, as shown at the macro level by studies such as Menon (2008) and Kang (2005). Aiba and Tha (2017) presented the first evidence of the great extent of dollarization in Cambodia by using a large-scale enterprise survey in 2014. This study uses a similar large-scale enterprise survey conducted in 2017 to reexamine the scale of dollarization in Cambodia. It also constructs balanced panel data for the 2014–2017 period to examine change in enterprises' choice of currency in their revenue, expenditure and price quotation.

The results from the 2017 survey show that the extent of enterprise dollarization in Cambodia remains intense in enterprises' revenue, expenditure, and borrowing. We observe high dollarization in revenue and expenditure in the Phnom Penh, Siem Reap, and North-West Areas relative to other regions.

Table 3.12 Main currencies used by firms with loans

	2017					*2014*			
	All firms		*Firms with loans*			*All firms*		*Firms with loans*	
	Frequency	*Percentage*	*Frequency*	*Percentage*		*Frequency*	*Percentage*	*Frequency*	*Percentage*
KHR	234	27.3	83	32.9	KHR	188	22.0	60	26.9
USD	585	68.3	151	59.9	USD	565	66.0	126	56.5
THB	32	3.7	15	6.0	Other currency	45	5.3	15	6.7
Don'tKnow	2	0.2			Don't know	10	1.2	1	0.5
N.A	.3	0.4	3	1.2	N.A	.48	5.6	21	9.4
Total	856	100	252			856		223	

Although the US dollar is observed in enterprise revenue and expenditure across regions, the meager share of THB currency in enterprises' revenue and expenditure is also observed in the North-West and South-West Areas, which are bordered by Thailand. Dollarization in expenditure is higher than that in revenues in all regions, which suggests that there is a currency mismatch in enterprise operations across regions. Moreover, dollarization in both revenue and expenditure tends to increase by enterprise size, while manufacturing and wholesale and retail trade exhibit higher dollarization in expenditure than in revenue. Interestingly, results from the panel data analysis of survey 2014 and 2017 show that there is an increase in KRH use in enterprises' revenues and expenditures across region.

On price quotations, we still observe high prevalence of pricing of goods and services in US dollars in Phnom Penh and Siem Reap, while pricing in KHR remains low in these regions. Nevertheless, pricing in both KHR and US dollars is also high in these regions. Pricing in KHR is instead more common in other regions, including the Central, South-West and South-East Areas. This apparently indicates that pricing in KHR is more common in rural areas than in urban areas. Firms tend to quote prices in KHR in response to their customers' choice of KHR and for the sake of convenience in price measurement, while others tend to quote in US dollars because they have to purchase their raw materials in US dollars and find it convenient to use US dollars as their price measure. Surprisingly, the results from panel data analysis show that there was a moderate improvement in KHR pricing behavior among enterprises, which is a good sign for further promotion of Khmer riel use, but no change in US dollar pricing behavior among enterprises. The majority of enterprises also borrowed largely in US dollars. However, since enterprises also use KHR in their operations, they are likely exposed to currency mismatches between operations and loans. US dollar currency is also used largely in informal accounting systems. Manufacturing and the wholesale and retail trade tend to have better access to finance than other sectors, while larger firms also tend to have better access to loans than smaller firms. As in the first survey, loans were mainly acquired in US dollars.

Overall, our study presents the positive sign of the progress in local currency promotion for the Cambodia enterprises from 2014 to 2017, although dollarization remains dominant, particularly in corporate finance. Thus, there are policies and rooms that have the potential to boost the use of KHR in enterprises. First, the KHR loan market should be expanded, where the banks and financial institutions are encouraged to disburse more KHR loans to small and medium enterprises. To do so, the NBC may ensure the KHR liquidity and issue regulations that require banks or financial institutions to have a certain proportion of KHR loans to enterprises.

Second, the NBC could cooperate with other public authorities to raise public awareness among enterprises about the benefits to the economy of local

currency. The starting point could be the Ministry of Labour and Vocational Training setting the minimum wage in KHR and encouraging garment factories to pay wages/salaries in KHR. Basically, garment workers receive wage/salaries in US dollars and they need to convert these into KHR before sending the remittances in Riels to their families in rural areas. If the exchange rate of KHR against the US dollar were unstable, these workers would be exposed to exchange rate risks. The NBC should also cooperate with the Ministry of Economy and Finance to implement the Law of Accounting (Article 9 of Chapter 3) that requires enterprises to prepare accounting records in the Khmer language and expressed in KHR.

Third, firms should be encouraged to use KHR for their operations including salary payments. Firms actively involved in the promotion of local currency shall be recognized or awarded by authorities. In this regard, the NBC should recognize/award firms or enterprises that use more KHR by inviting them to public events organized by the NBC, such as "Riel Day," so this becomes a showcase that could encourage participation from other firms.

Fourth, the country's financial development in terms of both width and depth should be facilitated to encourage firms to use local currency. In the current financial market, enterprises have currency mismatch risks, possibly due to the underdevelopment of a local currency loan market for SMEs. To encourage more firms to use local currency for corporate finance, there should be instruments to hedge the exchange rate for them. In this regard, the NBC should encourage the development of such hedging instruments. Nowadays, the microfinance sector has been widely developed to covering retail customers in Cambodia. However, there is still a problem of the missing middle, particularly a financial market for SME finance. The promotion of local currency is also relevant to the problem of financial inclusion, and for the further development of local currency there is room for government to support the development of a financial market for SMEs.

Notes

1 The detail of the survey and data is described in Appendix 3.1.

2 (1) The North-West Area includes provinces such as Banteay Meanchey, Otdar Meanchey, and Preah Vihear; (2) the North-East Area includes provinces such as Kratie, Mondul Kiri, Ratanak Kiri, and Stung Treng; (3) the Central Area includes Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, and Kandal; (4) the South-East Area includes Kampot, Kep, Prey Veng, Svay Rieng, Takeo, and Tboung Khmum; (5) the South-West Area includes Koh Kong, Preah Sihanouk, Pursat, Battambang, and Pailin; (6) Phnom Penh and Siem Reap are differently classified from the rest of the regions given that the former is the capital city while the latter is one of the leading tourist destinations of Cambodia, where the degree of dollarization is deemed to be high.

3 The "Agricultural sector" includes agriculture, forestry, fishing and mining. The "Tourism sector" includes transportation, storage and accommodation and food service activities. "Others" includes all remaining sectors.
4 The minimum wages for garment workers are determined in US dollars.
5 It is important to note that the sample of exporting firms is only around 70.

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Appendix 3.1: Design and data description of the NBC-JICA survey 2017

Survey design

We conducted a second-round survey of Cambodian enterprises in 2017. In this survey, we attempted to track the same firms interviewed in the first-round survey. Table A3.1 shows the number of firms we successfully tracked and those we failed to track. "Same enterprise sample, same respondent"

Table A3.1 The result of tracking the sample from the first-round survey

	Freq. (%)	*Freq. (%)*
Same enterprise sample, same respondent	332 (38.8)	332 (38.8)
Same enterprise sample, new respondent	203 (23.7)	203 (23.7)
New enterprise sample	321 (37.5)	321 (37.5)
Total	856 (100)	856 (100)

represents the sample where both an enterprise and the respondent from that enterprise are the same as in the first-round survey. "Same enterprise sample, new respondent" represents the sample where the enterprise is the same as in the first-round survey but due to various difficulties, the respondents who were interviewed were different. "New enterprise sample" represents the sample with different enterprises to those interviewed in the first-round survey due to our inability to track the original firms.

Table A3.1 shows that the sample we failed to track represented 321 firms. The rate of tracking firms is 62.5%. The reasons that we failed to track the same enterprises are set out below. Table A3.2 summarizes the frequency of the various reasons for replacements.

Relocate/Shutdown of the Enterprise

In a number of cases the enterprise had relocated. The survey team found that several enterprises had moved to different locations within and outside the selected communes/provinces. The survey team also found that some enterprises had shut down.

Physically Unavailable

Physically unavailable refers to respondents from the first-round survey being unavailable at the time of the second-round interviews. The survey team found several conditions impeded the survey process. These conditions were as follows: The respondent had resigned/been fired—the respondent participating in the first-round survey was not available for the interview and there was no possibility that the respondent would be able to represent the enterprise; the respondent was out of the office during the day—the respondent would not be able to participate in the survey although the team could reach them by phone since they were on mission/on leave/business trip, etc. at the time. The respondent was unavailable (sick, busy, etc.)—in particular, the respondent was not able to participate in the survey due to sickness (still at workplace) or being too busy. In those cases, respondents were replaced with a

Table A3.2 Reasons why the replacement happened

	Same sample	*Same sample but new respondents*	*New sample*	*Total*
Enterprise moves outside of selected district	-	0	10	10
Enterprise shuts down	-	0	87	87
Cannot contact/ cannot reach	-	0	47	47
Refuse when arrival	-	1	39	40
Refuse respondent from survey 1	-	0	1	1
Physically unavailable	-	202	133	335
Respondent has no intention to join	-	0	4	4
NA	332	.	.	.
Total	332	203	321	524

selected owner/manager or another member of the upper management from within the enterprise.

Cannot Contact/Cannot Locate the Respondent/ Enterprise

In some cases, the survey team was unable to contact the enterprises using the phone numbers given to them during the first-round survey. Hence, the enterprise and its respondent were out of reach. Another issue was when an enumerator was unable to find the enterprise, although the location of the enterprise had been confirmed through a phone call. The survey team found that small and micro-sized enterprises were particularly difficult to find, while medium and large enterprises were easier to find when the team was able to contact the respondent.

Refuse Upon Arrival at the Enterprise

Although the survey team contacted each enterprise to ask for their location and to obtain consent for the interview prior to the fieldwork, there were occasions when the respondent within the enterprise refused to participate in the interview upon the arrival of the survey team due to an unexpectedly high workload within their business or a personal emergency. Finally, some enterprises in the first-round survey rejected the survey and refused to continue in the middle of the interview.

In the cases where a replacement was needed, we replaced the original enterprises with new enterprises. The replacement criteria for new enterprises were that the new enterprises are of same "size" and in same "area" as the

enterprises they replaced; these criteria helped to establish consistency in terms of the characteristics in the data from the 2014 first-round survey. Therefore, the distribution of sample enterprises in the second-round survey is the same in terms of the location and size of enterprises. However, the distribution of sample enterprises may be different in other characteristics, such as industry categories.

Data Description

This study uses a nationally representative survey, which was conducted in 2017 with financial support from the Research Institute of the Japan International Cooperation Agency (JICA-RI). The survey collected information such as business profile, start-up capital, and enterprise classification, business activities, pricing behavior of products and services, perceptions on volatility of inflation rates, exchange rates and risk aversion, financial activities (assets, expenditure, employee payments, tax payments, and managing receivables and sales), use of banking systems (borrowing and loan, outstanding loan, and loan application planning), insurance, money transfer and money exchange, and future business needs (fundraising). It should be noted that respondents of selected enterprises were either managers or owners of the businesses.

This survey follows on from that of 2014. In the first survey, 856 enterprises were randomly selected from different strata based on the size[1] and geographical distribution of enterprises obtained from an enterprise population census collected in 2011. This second wave traced the same enterprises interviewed in the first wave and replaced those that had moved outside of the selected districts, shut down, were out of reach, refused to respond, or were physically unavailable for the interview in order to obtain the same sample size of 856 enterprises and to maintain the representativeness of the survey to the country. The distribution of enterprises across industries (Table A3.3) and regions (Table A3.4) in 2017 differs from those of enterprises across industries and regions in 2014. In this second wave, 94.6% of enterprises are owned by Cambodian nationals, while 4.8% of them are owned by foreigners.

It is important to note that distribution of enterprises across industries (Table A3.3) and regions (Table A3.4) in the 2017 survey differ from those of enterprises across industries and regions in the 2014 survey. Importantly, enterprises are largely concentrated in three main sectors—manufacturing, wholesale and retail trade, and accommodation and food service activities—which is consistent with the distribution of enterprises in the Economic Census of 2011 (Tables A3.5 and A3.6). This suggests that the results from our survey are not biased.

Table A3.3 Distribution of enterprises by industry

ISIC Rev.4	*Industries*	*2017*		*2014*	
		Obs.	*(%)*	*Obs.*	*(%)*
A	Agriculture, forestry, and fishing	5	1	7	1
B	Mining and quarrying	0	0	0	0
C	Manufacturing	145	17	178	21
D	Electricity, gas, steam, and air conditioning supply	3	0	1	0
E	Water supply; sewerage, waste management, and remediation activities	2	0	4	0
F	Construction	1	0	5	1
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	412	48	359	42
H	Transportation and storage	8	1	10	1
I	Accommodation and food service activities	203	24	170	20
J	Information and communication	8	1	13	2
K	Financial and insurance activities	0	0	1	0
L	Real estate activities	2	0	5	1
M	Professional, scientific, and technical activities	0	0	9	1
N	Administrative and support service activities	4	0	14	2
O	Public administration and defense; compulsory social security	1	0	0	0
P	Education	33	4	42	5
Q	Human health and social work activities	5	1	7	1
R	Arts, entertainment, and recreation	14	2	15	2
S	Other service activities	10	1	16	2
Total		**856**	**100**	**856**	**100**

Table A3.4 Distribution of enterprises by region

Areas	*2017*		*2014*	
	Observations	*Share (%)*	*Observations*	*Share (%)*
Phnom Penh	182	21	182	21
Siem Reap	61	7	61	7
North-West Area	64	7	64	7
North-East Area	49	6	49	6
Central Area	189	22	189	22
South-West Area	136	16	136	16
South-East Area	175	20	175	20
Total	**856**	**100**	**856**	**100**

Table A3.5 Distribution of enterprises across industry

Enterprise classification, Economic Census 2011	*Observations*	*Share (%)*
Mining and quarrying	179	0
Manufacturing	71,416	14
Electricity, gas, steam, and air conditioning supply	4,607	1
Water supply; sewerage, waste management, and remediation activities	461	0
Construction	188	0
Wholesale and retail trade; repair of motor vehicles and motorcycles	292,350	58
Transportation and storage	1,557	0
Accommodation and food service activities	69,662	14
Information and communication	4,711	1
Financial and insurance activities	3,584	1
Real estate activities	120	0
Professional, scientific, and technical activities	957	0
Administrative and support service activities	6,023	1
Education	9,874	2
Human health and social work activities	4,885	1
Arts, entertainment, and recreation	1,780	0
Other service activities	32,780	6
Total	**505,134**	**100**

Source: National Institute of Statistics 2012.

Table A3.6 Industry classification

Enterprise Code	*Industry classification*	*Description*
1	Agriculture, forestry, and fishing	1. Crop and animal production, hunting and related service activities 2. Forestry and logging 3. Fishing and aquaculture
2	Mining and quarrying	1. Mining of coal and lignite 2. Extraction of crude petroleum and natural gas 3. Mining of metal ores 4. Other mining and quarrying 5. Mining support service activities
3	Manufacturing	1. Manufacture of food products, 2. Manufacture of beverages 3. Manufacture of tobacco products 4. Manufacture of textiles 5. Manufacture of wearing apparel 6. Manufacture of leather and related products 7. Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials

(*Continued*)

Table A3.6 (Continued)

Enterprise Code	*Industry classification*	*Description*
		8. Manufacture of paper and paper products 9. Printing and reproduction of recorded media 10. Manufacture of coke and refined petroleum products 11. Manufacture of chemicals and chemical products, 12. Manufacture of basic pharmaceutical products and pharmaceutical preparations 13. Manufacture of rubber and plastics products 14. Manufacture of other non-metallic mineral products 15. Manufacture of basic metals 16. Manufacture of fabricated metal products, except machinery and equipment 17. Manufacture of computer, electronic and optical products 18. Manufacture of electrical equipment 19. Manufacture of machinery and equipment
4	Electricity, gas, steam, and air conditioning supply	1. Electric power generation, transmission and distribution 2. Manufacture of gas; distribution of gaseous fuels through mains 3. Steam and air conditioning supply
5	Water supply; sewerage, waste management, and remediation activities	1. Water collection, treatment and supply 2. Sewerage 3. Waste collection, treatment and disposal activities; materials recovery 4. Remediation activities and other waste management services
6	Construction	1. Construction of buildings 2. Civil engineering 3. Specialized construction activities
7	Wholesale and retail trade; repair of motor vehicles and motorcycles	1. Wholesale and retail trade and repair of motor vehicles and motorcycles 2. Wholesale trade, except for motor vehicles and motorcycles 3. Retail trade, except of motor vehicles and motorcycles
8	Transportation and storage	1. Land transport and transport via pipelines 2. Water transport 3. Air transport 4. Warehousing and support activities for transportation 5. Postal and courier activities
9	Accommodation and food service activities	1. Accommodation 2. Food and beverage service activities

Table A3.6 (Continued)

Enterprise Code	*Industry classification*	*Description*
10	Information and communication	1. Publishing activities 2. Motion picture, video and television program production, sound recording and music publishing activities 3. Programming and broadcasting activities 4. Telecommunications 5. Computer programming, consultancy and related activities 6. Information service activities
11	Financial and insurance activities	1. Financial service activities, except insurance and pension funding 2. Insurance, reinsurance and pension funding, except compulsory social security 3. Activities auxiliary to financial service and insurance activities.
12	Real estate activities	1. Real estate activities with own or leased property 2. Real estate activities on a fee or contract
13	Professional, scientific, and technical activities	1. Legal and accounting activities 2. Activities of head offices; management consultancy activities, 3. Architectural and engineering activities; technical testing and analysis 4. Scientific research anddevelopment 5. Advertising and market research 6. Other professional, scientific and technical activities 7. Veterinary activities
14	Administrative and support service activities	1. Rental and leasing activities 2. Employment activities 3. Travel agency, tour operator, reservation service and related activities 4. Security and investigation activities 5. Services to buildings and landscape activities 6. Office administrative, office support and other business support activities
15	Public administration and defence; compulsory social security	1. Administration of the state and the economic and social policy of the community 2. Provision of services to the community as a whole 3. Compulsory social security activities
16	Education	1. Pre-primary and primary education 2. Secondary education 3. Higher education 4. Other education 5. Educational support activities

(*Continued*)

Table A3.6 (Continued)

Enterprise Code	*Industry classification*	*Description*
17	Human health and social work activities	1. Human health activities 2. Residential care activities 3. Social work activities without accommodation
18	Arts, entertainment, and recreation	1. Creative, arts and entertainment activities 2. Libraries, archives, museums and other cultural activities 3. Gambling and betting activities 4. Sports activities, and amusement and recreation activities
19	Other service activities	1. Activities of membership organizations 2. Repair of computers and personal and household goods 3. Other personal service activities

Source: National Institute of Statistics 2012.

Note

1 Like the previous survey, size of enterprise is defined based on the asset volume of each enterprise. That is, micro enterprises are those with assets worth below US50,000; small enterprises have assets worth from US$50,000 to US$250,000; medium-sized enterprises have assets worth between USD 250,000 and US$500,000; and large enterprises have assets worth above US$500,000. The 2014 survey includes 204 large enterprises, 183 medium-sized enterprises, 251 small enterprises and 218 micro enterprises. The 2017 survey includes 209 large enterprises, 164 medium-sized enterprises, 289 small enterprises and 194 micro enterprises. Distribution of enterprises by size in the second wave does not differ substantially from that of enterprises by size in the first wave, suggesting that the second wave maintains the country representativeness of the survey.

4 Dollarization and Financial Institutions

Daiju Aiba and Sovanney Chey

4.1 Introduction

Financial institutions, along with other economic agents such as households and enterprises, play a significant role in dollarization. As Brown et al. (2014) document, foreign currency lending could be also a consequence of banks forcing firms and households to borrow in these currencies due to their incentive to hedge against the risk of currency mismatch in balance sheets. Recent studies of banks' behavior in foreign currency lending also suggest that there might be heterogeneity in their behavior that comes from differences in funding sources or ownership structures (Brown and De Haas 2012). In addition, there are also regional differences in the extent of deposits and loan dollarization within a country, due to differences in regional inflation rates and other regional factors (Brown, De Haas, and Sokolov 2018).

While several previous studies have investigated dollarization in the banking sector in Cambodia (e.g., Duma 2011; Menon 2008), only a few studies exist on the behaviors of individual financial institutions in Cambodia. Banks' funding sources and target customers are different across types of financial institutions, leading to the difference in bank behavior across institutions. Thus, knowledge about the differences in banks' behavior is needed to address dollarization. In this regard, Aiba and Sok (2017) investigated branch-level data from the period 2009–2013, and the bank-level data of balance sheets.

This chapter uses new branch-level data from 2013–2017 and bank-level data until 2020 to reveal the recent situation of dollarization and to investigate bank behavior relating to dollarization. From the analysis of branch-level data, we find that amounts of loans are lower than those of deposits in Phnom Penh, while the amounts of loans are higher than those of deposits in the provinces. We observe this trend for both of commercial banks and microfinance institutions, particularly in relation to US dollars. This suggests that financial institutions tend to collect funds in Phnom Penh financial institutions, which might be one of the main drivers in the spread of US dollars across the country. Our analysis further reveals that the amounts of KHR (or US dollars) between loans and deposits are balanced in most financial institutions, suggesting that

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financial institutions tend to hedge the risks of currency mismatches, and they only extend loans in a currency to the extent of the amount they collected in deposits and borrowings.

From bank-level data, we find that the recent local currency promotion policy of the central bank has pushed financial institutions to increase KHR loans, and the policy also caused the increase in KHR deposits. However, some MFIs are extending KHR loans to more than they collected in deposits, suggesting that those financial institutions could incur currency mismatch risks in their operations. Importantly, the recent coronavirus pandemic has negatively affected circulation of US dollars in the market. We find that US dollars cash collected at NBC branch offices and transferred from branches to headquarters has significantly decreased in 2020.

We believe that these findings from the survey are helpful and provide insights into the type of policy measures required to promote KHR currency in Cambodia. Furthermore, since dollarization is closely related to the issue of financial inclusion and financial stability, the results of our analysis can be also useful for making policies to achieve the stabilization and development of the Cambodian banking sector. The rest of the chapter is organized as follows: section 4.2 reviews the literature on Cambodian financial dollarization; section 4.3 provides the NBC policy for promotion of local currency in the financial sector; section 4.4 provides the empirical analysis; and section 4.5 concludes with a discussion of the policy implications.

4.2 Literature Review on the Role of Financial Institutions and Dollarization

4.2.1 The Role of Financial Institutions in Dollarization

The previous literature argues that financial institutions play an active role in promoting dollarization in response to the growing share of foreign currency in their liabilities. One of the motivations for financial institutions to lend in a foreign currency is to hedge against currency mismatch risks between liabilities and assets. Basso et al. (2011) examine aggregate credit dollarization in 24 transition countries over the period 2000–2006. They find that countries in which banks have a higher share of foreign funding display a higher share of foreign exchange loans, meaning that dollarization could be the consequence of banks' adjustments of the currency composition between their assets and liabilities. Similarly, using cross-country data, Luca and Petrova (2008) found that sources of funds in terms of deposit dollarization can impact foreign currency lending, while the foreign liability of banks has no relation to foreign currency lending. Using the loan application and granted loan data of one Bulgarian bank, Brown et al. (2014) investigated whether the supply side or demand side determines the currency choice in loans. The authors showed that banks' decisions affect the choice of currency in corporate loans rather than on the consumer side, since it is less risky and can mitigate the currency

mismatch in bank assets and liabilities. Caglayan, Pham, and Talavera (2021) also found the same behavior in Türkiye's (formerly Turkey) banking sector.

Some previous studies found evidence for heterogeneity in bank behavior in foreign currency lending. In particular, the extent of foreign currency lending by banks seems to be dependent on their ownership and their access to foreign funding sources. De Haas and Naaborg (2006) and de Haas and Van Lelyveld (2006, 2010) show that parent bank funding, typically denominated in foreign exchange currency, influences the credit growth of foreign subsidiaries. To the extent that subsidiaries do not swap these funds into local currency, access to parent bank funding may have a positive impact on foreign exchange lending. By examining individual Polish banks during the period 1996–2006, Degryse et al. (2012) provide evidence that foreign exchange lending in Poland is related to bank ownership. They find that greenfield foreign-owned banks provide more foreign exchange loans than domestic banks or foreign-owned banks. Brown and Da Haas's (2012) studied foreign banks and foreign currency lending in Eastern Europe using bank-level data from 2001–2004, consisting of 95 foreign-owned banks and 98 domestic banks in 20 transition economies. They found that banks with more foreign currency shares in deposits tended to extend loans in a foreign currency, regardless of the ownership structure.

However, there is another view that currency choice in loans is bilateral, with both the lender and borrower possibly affecting the choice. In addition to the hedging behaviors of financial institutions, dollarization in deposits and loans can also be determined by borrower and depositor preferences. Ize and Yeyati (2003) established the theory of dollarization in which borrowers' and depositors' risk-hedging behaviors can explain the degree of dollarization, and in particular their expectations about the volatility of the inflation and exchange rates. Brown et al. (2018) found regional differences in the extent of dollarization within a country. The authors employed data on the aggregated amounts of deposits and loans by region in Russia and found that the regional inflation rates affected the extent of regional dollarization.

Some recent studies have also investigated currency mismatch risks in MFIs. As discussed above, in the literature of dollarization there is a range of empirical evidence that financial institutions tend to pass the currency mismatch risks onto their borrowers by lending in a foreign currency. However, MFIs usually tend to extend loans in the local currency, while a majority of the funds come from international funding sources. Even though the objective of MFIs is to reduce poverty, there is some evidence that MFIs might pass the risks onto borrowers by raising interest rates rather than by lending in foreign currency. For example, from the cross-country sample, Al-Azzam and Mimouni (2017) found severe currency mismatch risks in microfinance lending as interest rates are likely to be higher for MFIs with more foreign currency debts. Consistent with that outcome, Gietzen (2017) notes that the currency mismatch risks of MFIs are more severe than those of commercial banks. However, these studies focused on the risks of currency mismatch in the case of countries

where dollarization is not seriously involved. MFI operations and their role in dollarized economies are not extensively focused on in the previous literature.

4.2.2 The Case of Cambodia

Even though Cambodia is one of the most dollarized economies, research on dollarization in the country is very limited, and there are no micro-level studies on financial institutions (de Zamaroczy and Sa 2002; Duma 2011; Siregar and Chan 2014). De Zamaroczy and Sa (2002) empirically estimate the level of dollarization in the Cambodian economy using macro-level data. Duma (2011) researched the cause and impact of Cambodian dollarization using macro data. She points out that despite macroeconomic and political stability, the level of dollarization keeps rising and has surpassed the Riel. She explains that there are two types of economy in Cambodia: the urban economy, which is mostly dollar-based and has benefited a lot from the garment sector, tourism, FDI, and aid; and the rural economy, which depends on agriculture and is Riel-based. Okuda (2017) developed a model to analyze the role of banks in dollarization in Vietnam, Laos, and Cambodia. This research shows that the expansion of foreign exchange currency loans in those regions is fully financed by the intermediation of domestic foreign exchange funds by financial institutions. He also suggests that there are strong network externalities for the US dollar in Cambodian dollarization since the unit of transaction and the means of payment are also denominated in US dollars (real dollarization) and there are no regulations on the usage of US dollars. He further argues that Cambodian dollarization is distinct from the case of dollarization in Central and Eastern European countries (CEECs). In the case of the CEECs, US dollar lending is driven by the large share of foreign currency funds in total funds, which are mostly provided from overseas. Meanwhile, in the case of Cambodia, banks collect foreign exchange-denominated funds from local people because the means of payment and the unit of account are dollarized, and foreign exchange currency is widely held by local people.

Even though several prior studies have addressed dollarization issues in Cambodia, there is a paucity of studies on the intersection between MFIs and dollarization issues. Aiba and Sok (2017) is the first study to investigate the extent of dollarization using branch data of ten commercial banks and five MDIs. Although the authors did not identify the cause of foreign currency lending and deposits by Cambodian financial institutions, their findings are suggestive when we are endeavoring to understand how much dollarization prevails in Cambodian commercial banks and MFIs. First, they find that MFIs have more KHR currency in their balance sheets than commercial banks do. For example, as of 2013, MFIs keep around 20% of total loans, deposits, and borrowings denominated in KHR, while commercial banks keep less than 10% in KHR. Second, KHR deposits as a share of total deposits have been stable both in commercial banks and MFIs despite recent rapid growth in total

deposits. This suggests that the demand for local currency deposits have also increased at the same rate as foreign exchange currency deposits. However, the authors also find that shares of foreign exchange currency in loans from MFIs soared from around 60% in 2009 to 80% in 2013, reaching almost the same level as shares of foreign exchange currency in deposits and borrowings. The authors interpret this to mean that MFIs changed their attitude toward the risk of currency mismatch on their balance sheets, and as a result started to decrease these risks by matching the composition of loans to those of deposits and borrowings. In addition, that change could also be the consequence of commercialization in MFIs. Specifically, MFIs might have begun to provide foreign exchange currency to increase profits.

Aiba and Sok (2017) also investigated the difference in lending and collecting funds by financial institutions among regions. Interestingly, they found a clear tendency in fund allocations by both commercial banks and MFIs. Their findings show that in urban Areas the amounts of loans are smaller than those of deposits, while the opposite is true in rural areas. For example, the amounts of loans are smaller than that of deposits in Phnom Penh, while amounts of loans are larger than those of deposits in other areas. This suggests that banks collect funds mostly in urban areas, where wealthier people more likely to live, and banks mobilize the rest of their funds to rural areas, where firms are mostly small and medium sized and face shortages of funds. This may also imply that the investment opportunity is currently higher in rural areas than urban areas in Cambodia. Importantly, Aiba and Sok (2017) also reveal that this trend is more strongly observed in the KHR currency for commercial banks, implying that commercial banks are reluctant to lend in local currency, even if they have enough funds to do so. In the meantime, MFIs are actively mobilizing excess KHR funds from urban areas to rural areas as well as foreign exchange currency funds. In this sense, commercial banks play a role in driving dollarization across the Cambodian economy.

4.2.3 Overview of the Cambodian Banking Sector

Before discussing the results of analysis of our survey data, we describe the institutional background of the Cambodian banking sector. After the prolonged civil war ended in 1999, Cambodia experienced rapid economic growth. Cambodia has experienced an annual average 8.3% growth in GDP growth over the last 15 years (Cheng 2016) and this high growth rate has attracted large capital inflows. Cambodia is a very open economy and the Cambodian government has adopted a liberal stance toward foreign investment and trade, leading to huge capital inflows (Hill and Menon 2014). Most capital inflows are in the forms of official development assistance (ODA), foreign direct investment (FDI), and banking and monetary market transactions (BMM). As argued by previous studies, the bank lending flows are the most unstable and subject to a sudden stop (Becker and Noone 2008; Brouwer

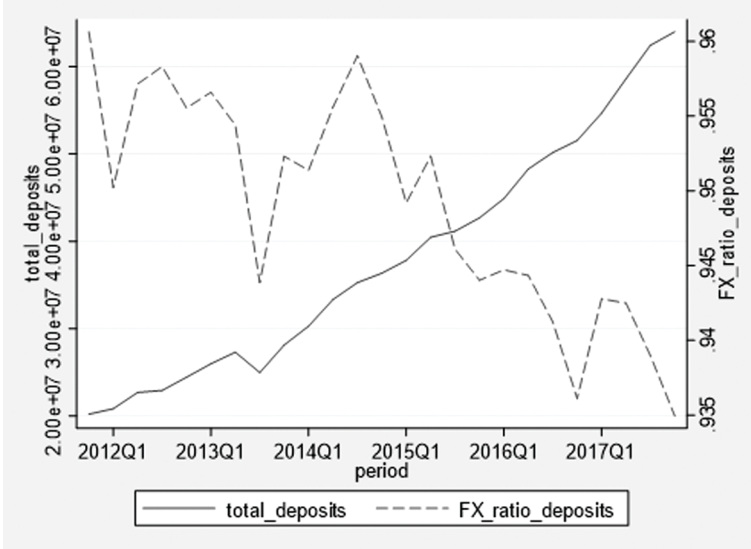

Figure 4.1 Ratio of foreign exchange deposits to total deposits (right-hand axis shows the ratio of FX deposit to total deposits, and left-hand side shows the amount of total deposits)

Period: From 2012Q1 to 2017Q4.

Source: National Bank of Cambodia. Author's calculation.

1999). Thus, high dependency on foreign funding through borrowings or deposits is likely to make the entire economy vulnerable to external shocks. In the case of Cambodia, Cheng (2016) found that recent capital flows have been volatile and have been the main driver of this is BMM.

Figure 4.1 shows the share of foreign currency deposits in total deposits in the banking sector. Even though the share of foreign currency deposits has been decreasing in recent years, substantial amounts of deposits are still denominated in foreign currencies. Indeed, gross official reserves only cover 57% of foreign currency deposits, which severely limits the capacity of the central bank as a lender of last resort (IMF 2018). Aside from limitations on lender of last resort, deposit insurance is absent. The lack of these institutional arrangements might lead to high liquidity buffers in banks.

The banking sector plays a pivotal role in fund mobilization in Cambodia because there is no other capital market actively functioning in the country. There is no bond market and, although a stock exchange market was opened in 2011, there are only eight companies listed on the stock market as of 2020. The Cambodian financial sector comprises three types of financial institution: commercial banks, specialized banks, and microfinance institutions (MFIs). As of 2020, banks had about 85% and microfinance institutions had 15% of total

assets in the banking sector, while specialized banks had less than 1%. In particular, MFIs can be divided into two entities: deposit-taking MFIs (MDIs) and non-deposit-taking MFIs (non-MDIs). More than 90% of total assets of the microfinance sector are owned by MDIs. Minimum capital requirement, reserve requirement ratios, and liquidity ratios are different for each type of financial institution. In particular, a maximum amount of loan provision per borrower is applied to MDIs and MFIs. Banks are allowed to provide all financial services, while the regulation on them are most strict in terms of capital requirements and reserve requirements. The important characteristic of the Cambodian banking sector is that there are two state-owned commercial banks, but the credit supply is completely delegated to private entities.

Structures of assets are significantly different between MDIs and MFIs. Figure 4.2 shows the recent trends in the structure of assets and liabilities for commercial banks, MDIs, and MFIs. As suggested by Aiba and Sok (2017), MDIs have experienced significant changes in the composition of their liabilities from 2006 to 2017. The figures also suggest that the trends are different between commercial banks and MFIs. As is the case in other developing countries, deposits dominate the majority of funding sources for commercial banks, while borrowings are more important funding sources for MFIs. However, in recent years, deposits as percentages of total liabilities have been increasing in MFIs, suggesting that MFIs have been transformed into sustainability-oriented entities, with more emphasis on commercial funding sources such as deposits.

The lack of a lender of last resort and other institutional arrangements might also explain the differences in the asset composition. Figure 4.3 also shows that there are differences in the composition of assets between commercial banks and MFIs. Commercial banks have a high proportion of liquid assets, which fluctuated from 35% to 40% over the period studied, while MFIs consistently kept liquidity assets of less than 20% over the period. This suggests that banks are risk-averse and tend to keep massive liquid assets. Furthermore, the absence of deposit insurance and lack of a lender of last resort could cause the high levels of liquidity in the banks. Deléchat et al. (2012) shows that lenders of last resort are unlikely to work under the dollarized economy, and banks have to prepare for the entirety of liquidity shocks on their own. In addition, the low liquidity of MFIs might reflect the fact that their main funding sources are wholesale borrowing rather than deposits. Then there is specific repayment rate and no chance of unexpected withdrawals.

In recent decades, there has been a substantial increase in capital flows into the Cambodian financial sector from abroad. Panel A of Figure 4.4 shows that the ratio of non-resident liabilities in the banking sector has constantly increased in recent years, meaning that the Cambodian banking sector became more dependent on foreign funding sources during this period. This recent higher exposure to foreign funding might be one of the channels bringing US dollars into the Cambodian domestic loan market.

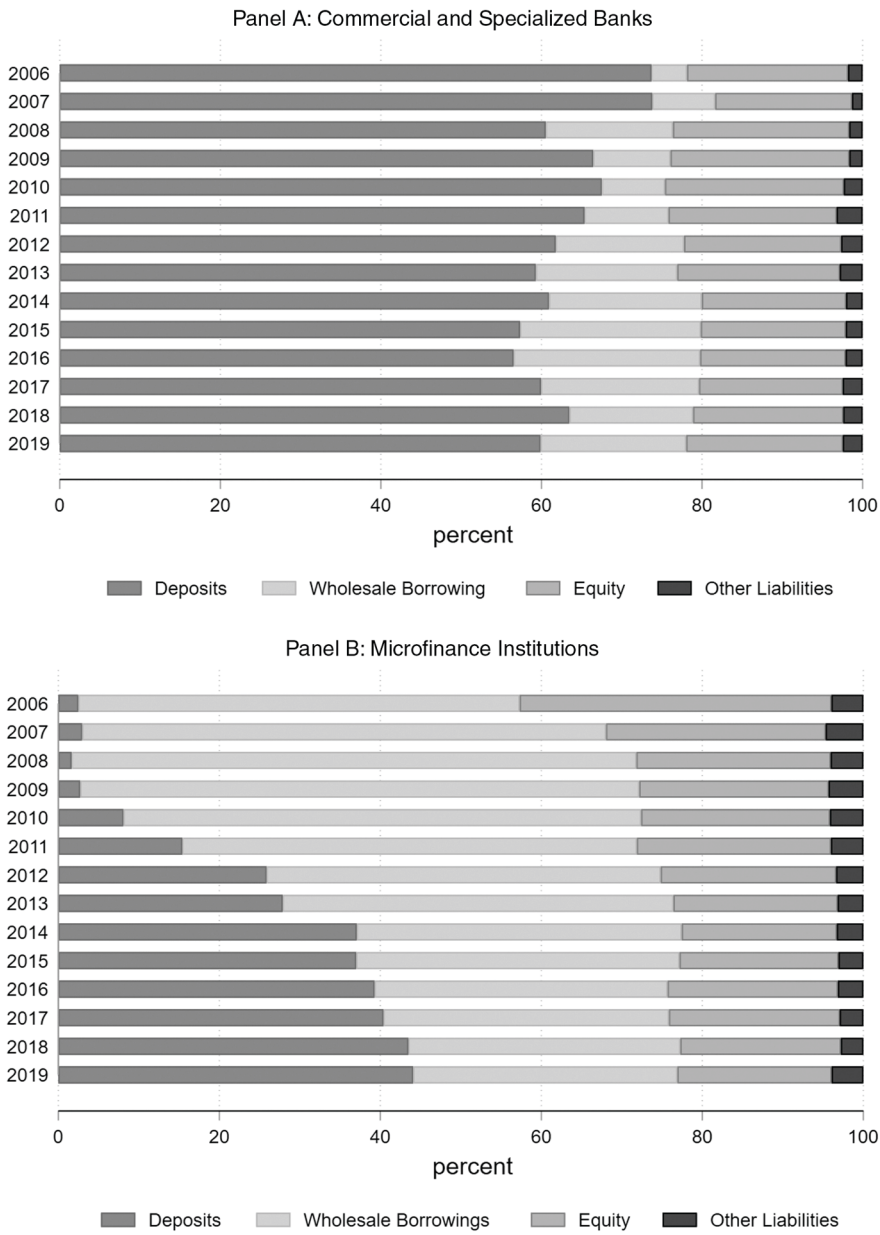

Figure 4.2 Evolution of structure of liabilities

Source: NBC Annual Report 2006–2019. *Note*: Author's calculation.

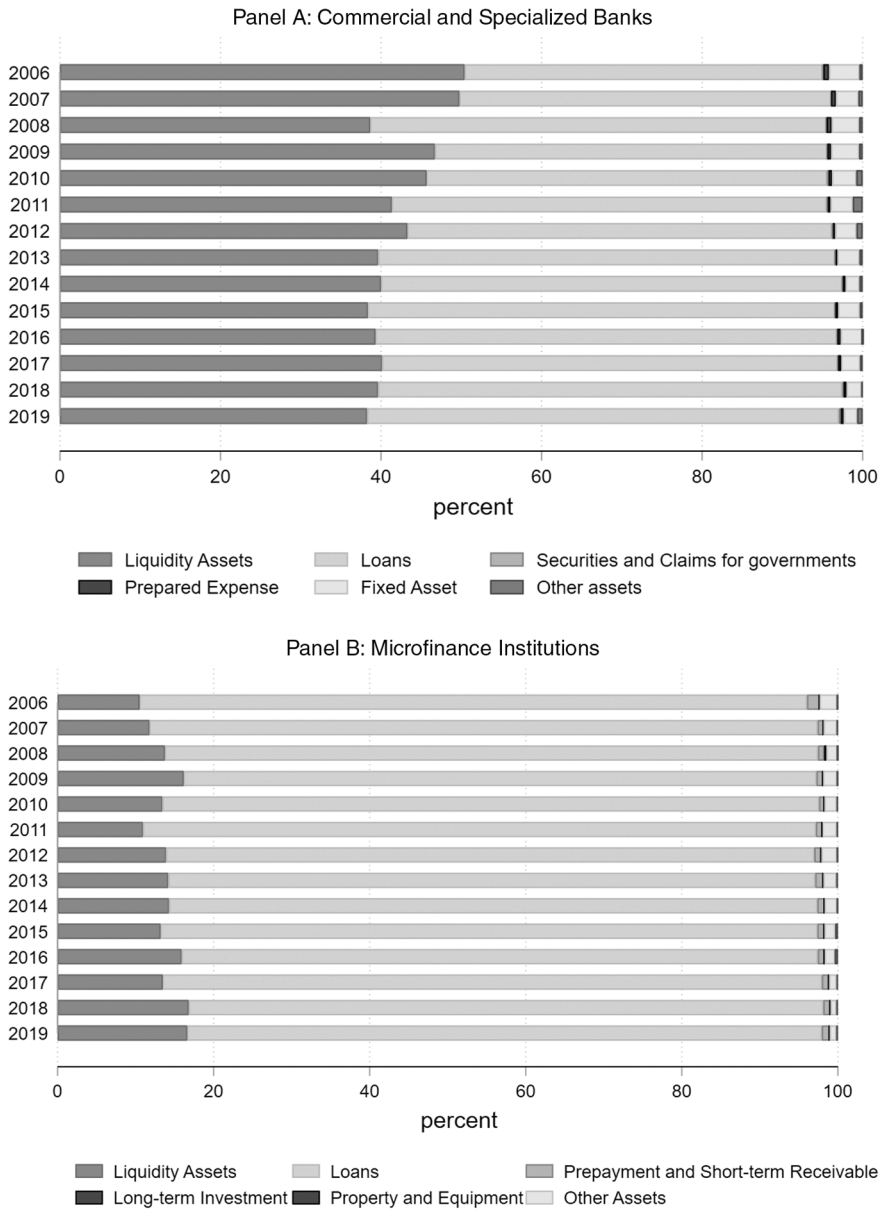

Figure 4.3 Evolution of structure of assets

Source: NBC Annual Report 2006–2019. *Note*: Author's calculation.

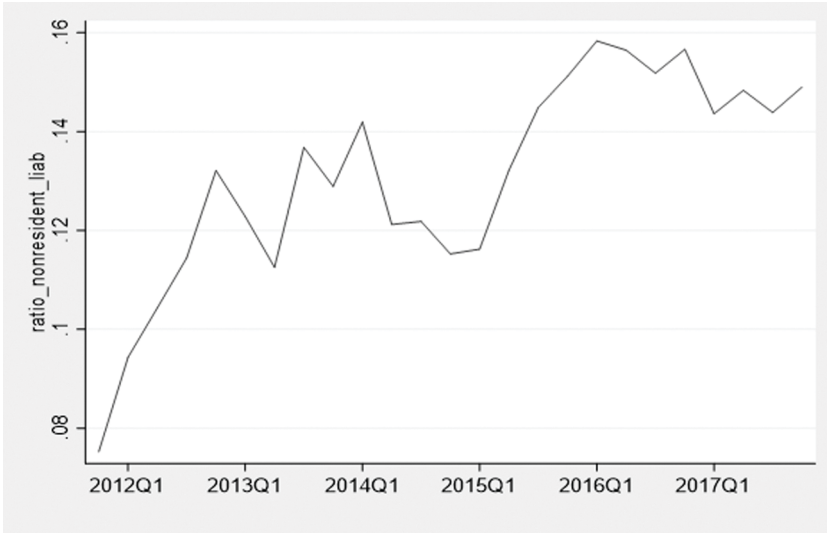

Figure 4.4 Ratio of non-resident debts to total liabilities

Note: Data are from 2012Q1 to 2017Q. We obtained this administrative data from the National Bank of Cambodia. This enabled the collection of individual-bank balance sheet data that included the breakdown of deposits, borrowing, and equity by domestic and foreign sources. The data is on a quarterly basis and covers the period from 2011Q4 to 2017Q4.

Source: Author's calculation of data provided from National Bank of Cambodia.

4.3 The NBC's Policies to Promote KHR

4.3.1 NBC Policy Promotion of KHR in the 1990s

The last decade has also been characterized by progress in the promotion of KHR. The dollarization of Cambodia has been prominent, and has persisted since the 1990s. The Cambodian people have adapted themselves to dealing with multiple currency in their daily life transactions. The macroeconomic statistics also show the high extent of dollarization as US dollar deposits have dominated, representing some 90% of the entire deposits in the banking sector for decades. The US dollar has subsumed the function of the local currency as a store of value. US dollars have been also used in domestic transactions as well as for exporting and importing purposes.

In March 1995, the NBC issued banknotes with high face value, up to 100,000 Riels (equivalent to US$25). The decision to issue them was not due to a large depreciation in the exchange rate as experienced in some countries, but because having larger denomination notes in KHR could enhance the effectiveness of the domestic currency as a medium of exchange. In 1995, the inflation rate was recorded at 2.8% and the exchange rate of the KHR

against the US dollar was 2,483 KHR per US dollar, an appreciation of 3.8% compared with the previous year. The purpose of issuing banknotes was mainly the promotion of local currency with the belief that the use of smaller denomination US banknotes (US$20) could be phased out. However, at that time those notes were not widely used by the public because there were limited channels for them to be returned to the NBC, and very old notes remain in circulation.[1]

Since 1998, the NBC has maintained exchange rate stability and attempted to make holding KHR and US dollars indistinguishable to further build the public confidence in KHR while encouraging saving and payments in KHR. As confidence in the currency has increased, the use of the KHR currency rose. Over the last two decades, the fluctuation in exchange rate has been registered at less than 2% per year, contributing to maintaining price stability in a highly dollarized economy. The value of the Riels has been stabilized mainly through foreign exchange intervention according to market conditions, in that the NBC sold US dollars and purchased KHR if the KHR depreciated, and vice versa in the case where KHR appreciated in value.

4.3.2 NBC Policy of Promotion of KHR in the 2000s

The policy on the promotion of the use of the Riel has been included in the national policy agenda—for instance, in the Financial Sector Development Blueprint 2001–2021 and the Financial Sector Development Strategy 2006–2015 and 2016–2025. This involves relevant agencies jointly promoting the use of Riels as the NBC alone could not achieve the long-term goal without the support from relevant agencies and the public. There were also attempts to promote KHR by using monetary policy tools. The reserve requirement was initially set at the same levels (8% for any currencies). In June 2008, the NBC differentiated the reserve requirements for local currency and foreign currencies by keeping one in KHR at the same level and doubling the reserve requirement for foreign currencies (8% for KHR and 16% for foreign currencies). This differentiation in reserve requirements between local currency and foreign currencies was aimed at increasing the funding cost of foreign currencies and further promoting financial intermediation in KHR. Although the reserve requirement was raised during the global financial crisis, the policy was mainly aimed at slowing down the credit growth of foreign currencies. Thus, it reflected the intention of the expansion of KHR use and the stringency of US dollar use during the crisis, given the absence of the NBC's role as the lender of the last resort in foreign currencies.

In January 2009, to deal with the decline in credit growth due to the global financial crisis, the reserve requirement for foreign currencies was cut from 16% to 12% while the requirement for the local currency remained the same (8%). Still, there is a differentiation between KHR and foreign currencies. At the same time, the NBC has made efforts to replace old, dirty banknotes with new ones to ensure the sufficient supply of notes based on the demand from

the public as well as strengthen the quality of domestic currency and improve its attractiveness. Furthermore, new types of notes have been issued periodically to further expand the use of the national currency. The public prefers holding new domestic currency banknotes as a medium of exchange and store of value.

4.3.3 NBC Policy of Promotion of KHR Since 2010

The 2010s were a period when considerable progress was made in local currency promotion. After the confusion of the global financial crisis gradually calmed down, the Cambodian financial sector again experienced rapid expansion in terms of the number of borrowers and the amount of outstanding loans in the early 2010s. In September 2012, the reserve requirement in foreign currencies (including external borrowing) was raised from 12% to 12.5%. The primary objective for the increase was to signal higher credit growth, in particular credit allocations in US dollars.

Since September 2013, the Negotiable Certificate of Deposits (NCDs) has been introduced for the following purposes: (1) to develop the money and interbank market on a secure basis; (2) to provide additional options for liquid asset holding; (3) to reallocate financial resources among financial institutions and to deepen financial intermediation; and (4) to establish market-based instruments for monetary policy. These are known as short-term and interest-bearing debt instruments issued in both local currency and US dollars to help financial institutions manage excess liquidity over the short term. NCDs allow the NBC to absorb the liquidity from the banking system and serve as an available financial instrument in the local currency, which remains limited in the case of Cambodia.

In September 2016, the NBC introduced a further monetary policy tool, liquidity-providing collateralized operation (LPCO), with the objectives of: (1) establishing a benchmark rate for the market to serve the conduct of the monetary policy based on the market mechanism; (2) promoting NCDs, which could then be used as collateral in interbank market transactions; (3) promoting the use of Riels; (4) supporting agricultural sector development; and (5) contributing to lowering the current high interest rate in KHR. In this operation, the NBC acts as a provider of KHR to financial institutions to deal with the liquidity shortage in the local currency. KHR funds are provided as a debt of those financial institutions to the NBC. The receivers of the KHR funds are determined through auction. The financial institutions offer the price and amounts of KHR needed at auction in exchange for US dollar deposits as collateral. The LPCO is regularly conducted by financial institutions to meet the regulatory requirement of the 10% KHR loan policy, and to contribute to lower funding costs in domestic currency. LPCO is conducted twice a month via the NBC platform.

The big move towards the promotion of domestic currency use happened in December 2016. The NBC issued a Prakas to require all banks and financial

institutions to have credit allocations in local currency covering at least 10% of their total loan portfolio by the end of 2019. When banks and financial institutions expand lending in US dollars, KHR loans need to be extended as well to keep the local currency portfolio in total credit in compliance with the regulation. This has led to a jump in domestic currency lending. The proportion of KHR credit over total loans was stagnant at approximately 4.1% until the end of 2016 and picked up to 12% in 2019, reaching 13.1% in 2020. After its downward trend in annual growth rate until the first quarter 2017, it jumped by 143% at the end of 2019 before decelerating to about 26% in 2020.

Under the NBC's efforts, in 2018 corporate bonds were allowed to be issued solely in local currency. Some corporates have applied the foreign exchange indexed bonds to make their bonds more attractive for investors in the extended highly dollarized economy, although the fluctuation in exchange rate remains limited. This momentum continues for the issuance of government securities. Given the low government securities, bonds could be issued in Khmer Riels or US dollars, within or outside Cambodia. This further develops a financial instrument in local currency that has also contributed to the increase in KHR use in financial markets.

The NBC continues to promote KHR for cross-border payments. In February 2020, a QR code-based cross-border payment between Cambodia and Thailand was launched. Cambodians and Thais are able to make payments in Khmer Riels or Thai Baht by using a mobile banking application at retail merchants in Cambodia or Thailand. This collaboration in the area of cross-border payments and remittances is also seen between Cambodia and Malaysia, as witnessed by the Bakong payment system and the Maybank digital platform. Currently, it is in the process of system integration of Maybank's digital platform into Bakong. Meanwhile, Project Bakong, a backbone payment system introduced to support the cashless economy, is believed to have reduced the circulation of US dollars in the market.

In May 2020, another stronger move was made by the NBC's announcement on phasing out small-denomination US dollar banknotes—US$1, US$2, and US$5—from the market by transferring the transportation cost of exportation of those banknotes to individual banks and financial institutions from September 2020. This expands the circulation of Riels to substitute those small banknotes and results in no further injection of those notes from banks and financial institutions and other businesses when received from their customers. Although the current practice is that the NBC remains the entity responsible for the exportation cost, the behaviors of banks and financial institutions and some businesses remain the same, with no recirculation of the US dollar small banknotes and change to the market being in Khmer Riels.

A marginal lending facility (MLF), an overnight lending instrument, was introduced in September 2021. The objectives of the instrument are: (1) to allow financial institutions in need to receive short-term liquidity support as demanded; (2) to cover the lack of liquidity from the reduction of allotment in LPCO; (3) to prevent the over-competitiveness by financial institutions to get

LPCO leading to high interest rates; and (4) to set a short-term ceiling rate for the market. The NBC acts a liquidity provider in local currency to banks and financial institutions that could accommodate the demand for Khmer Riels and smooths the financial intermediation in domestic currency. In addition, the NBC also conducts various public awareness campaigns, such as "I Love Riel" and "Riel Day."

4.4 Dollarization in Cambodian Financial Institutions

4.4.1 Trends in Recent Dollarization in Cambodia

First, we discuss the foreign currency deposits and loans in consolidated data at the bank level. We obtained data about deposits and loans by currencies at bank level on a monthly basis in the period from January 2016 to December 2020. Figure 4.5 shows the shares of KHR and foreign currency in loans and deposits for banks and MFIs from 2016 to 2021. In the recent trend in KHR currency promotion, the announcement of "10% KHR loan portfolio policy" apparently had a positive impact. Until December 2016, the ratio of KHR loans to total loans was almost zero for commercial banks. However, after the announcement of this policy, some commercial banks started lending in KHR, and the ratio of KHR loans to total loans has started increasing in the commercial banking sector. In December 2019, the implementation date of the policy, the share of KHR loans in total loans reached more than 10%.

Along with increases in KHR loans, there were also increases in KHR deposits in commercial banks. The ratio of KHR deposits to total deposits was about 5% in January 2016. However, the ratio of KHR deposits has constantly increased until recently. In particular, it jumped from 6% to 8% during 2019, possibly because commercial banks needed KHR deposits to meet the 10% policy by the end of 2019.

In the meantime, in MFIs, the shares of KHR deposits and loans show different trends compared with commercial banks. First, the ratio of KHR loans decreased in MFIs from 2016 to 2017. In March 2016, the ratio of KHR loans was about 18%, then it decreased to about 12% in October 2017 due to the transformation of one MDI into a commercial bank. However, the ratio of KHR loans started increasing after the decline, and it reached about 20% in January 2020, possibly because the KHR loan portfolio policy worked to reverse the declining trend in KHR loans. In contrast, the ratio of KHR deposits to total deposits constantly decreased from January 2016 to March 2021. In this period, the amount of the MFIs' total deposits expanded from KHR 7.9 trillion to KHR 15.5 trillion, while total KHR deposits increased only from KHR 1.1 trillion to KHR 1.7 trillion.

For the non-deposit-taking MFIs, we also present the movement of currency composition of wholesale borrowing in Figure 4.6. In 2018, KHR wholesale borrowing was almost zero, while it increased significantly after

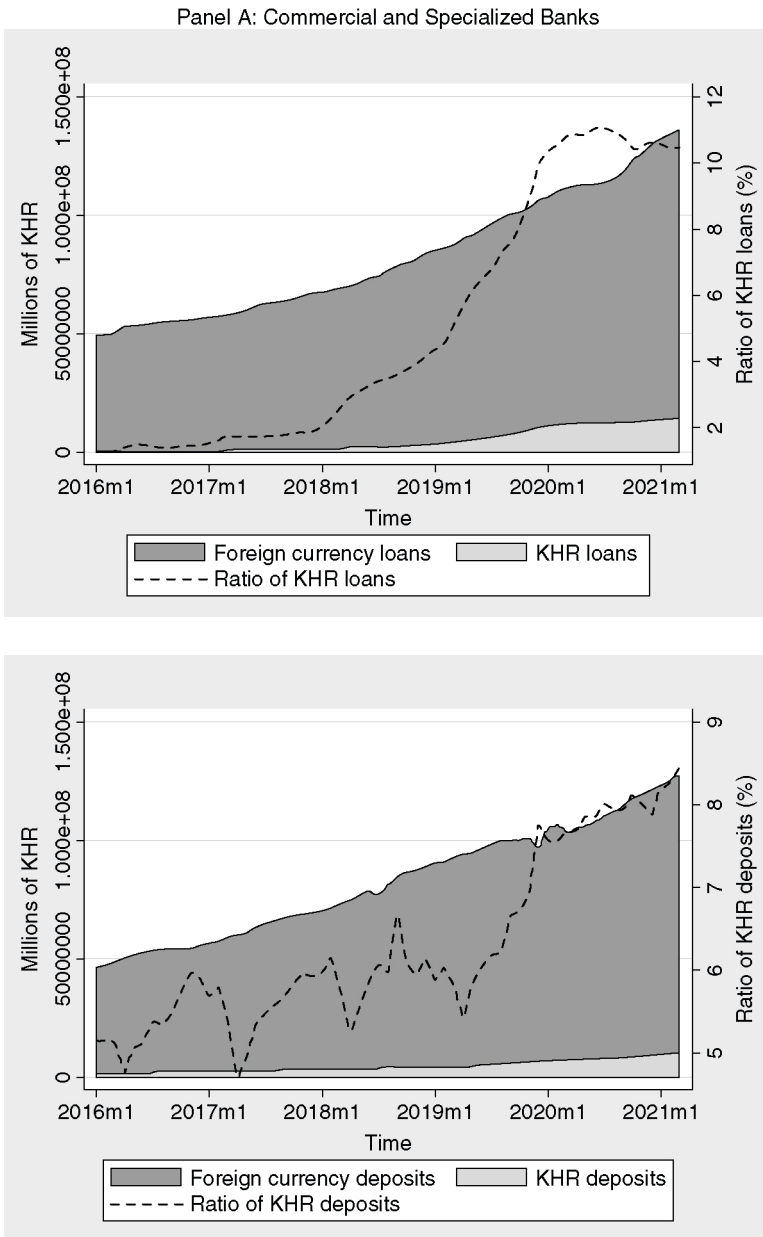

Figure 4.5 Shares of KHR in aggregated loans and deposits in the banking sector

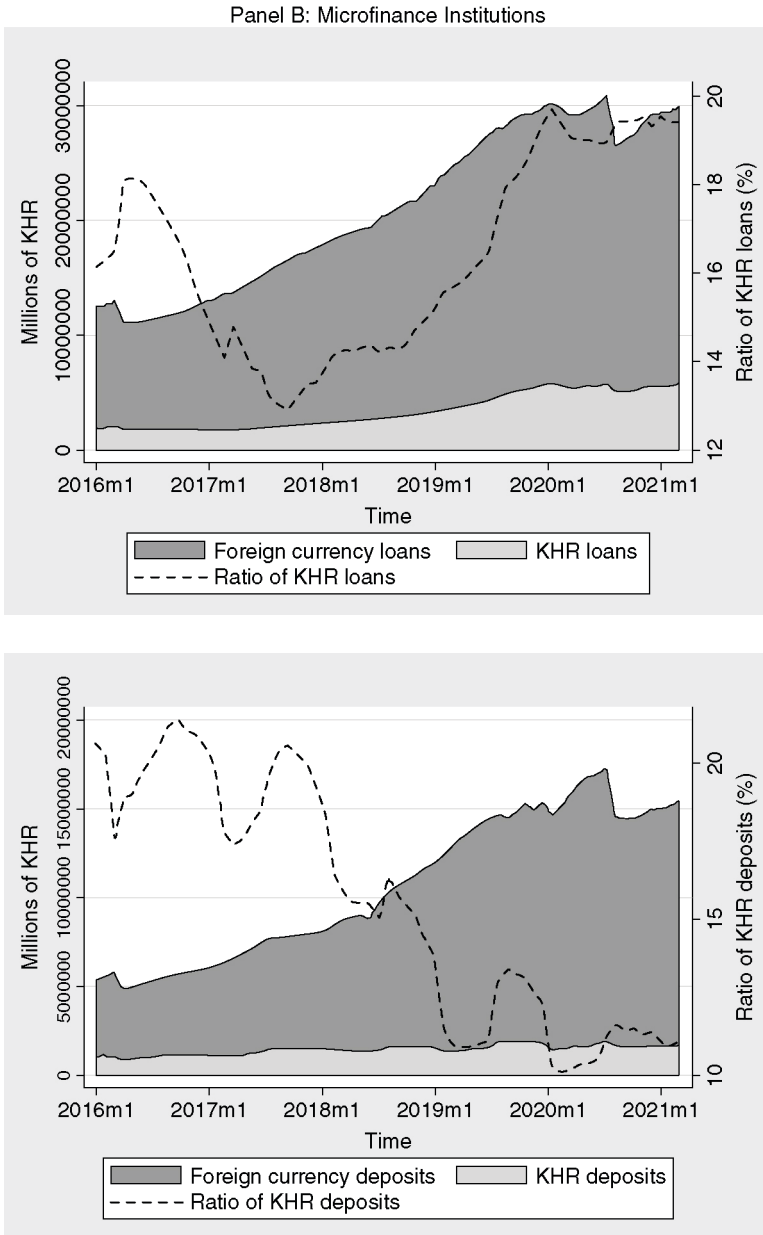

Figure 4.5 (Continued)

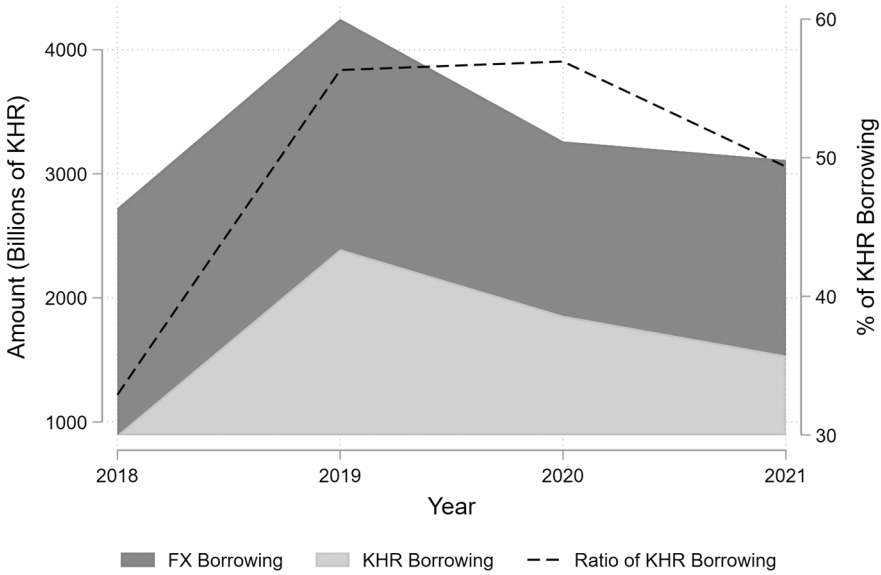

Figure 4.6 Non-deposit-taking MFIs' wholesale borrowing from local institutions (not including foreign wholesale borrowing)

2019. This suggests that MFIs increased KHR wholesale funding, possibly from domestic lenders, to meet the 10% KHR loan portfolio policy.

The slowdown of KHR deposit growth of MFIs in 2018 and 2019 might be explained partially by introduction of the interest rate cap policy on lending in 2017, which has been applied to MFIs since April 2017. Due to the low interest rate environment, MFIs might have been in need of funding at low price to keep lending at a low lending rate.[2] As the NBC provides LPCO to exchange US dollar deposits for KHR funds with financial institutions, US dollar deposits can be also used for funds for KHR lending. Since the market rates of KHR deposits are basically higher than US dollar deposits, MFIs might have shifted to low interest rate US dollar deposits or wholesale borrowing after the introduction of the interest rate cap policy. Supporting this view, the MFIs significantly increased their KHR wholesale borrowing in 2019 (Figure 4.6).

4.4.2 Analysis of the Branch-Level Data of Financial Institutions

To understand how Cambodian dollarization spread across the country, we employ data from a survey on 15 commercial banks and 12 microfinance institutions at branch level in 2018. The survey was conducted as a joint project of NBC and JICA. In this survey, the targeted commercial banks and microfinance institutions were selected based on asset sizes reported in NBC's annual report of 2017 (National Bank of Cambodia 2017) and

Table 4.1 Targeted financial institutions

	Type	*Bank*	*# of branch report*	*# of branches in 2017*
1	Bank	ACLEDA	100	261
2	Bank	ABA	51	51
3	Bank	ANZ	17	15
4	Bank	BIDC	8	8
5	Bank	CATHAY	No	14
6	Bank	Cambodia Post Bank	No	42
7	Bank	CAMPU	No	30
8	Bank	CANADIA	No	58
9	Bank	CIMB	13	13
10	Bank	FTB	No	11
11	Bank	Maybank	21	21
12	Bank	PPCB	17	17
13	Bank	RHB	13	12
14	Bank	SACOM	No	9
15	Bank	UCB	13	13
16	MDI	AMK	34	151
17	MDI	AMRET	156	156
18	MDI	HKL	58	170
19	MDI	KREDIT	82	156
20	MDI	LOLC	73	73
21	MDI	PRASAK	176	176
22	MDI	WB	116	117
23	MDI/Bank	SATHAPANA**	119	168
24	MFI	CHAMROEURN	21	21
25	MFI	Ly Hour	27	27
26	MFI	NIRON	13	14
27	MFI	SEILANITHIH	26	16

asked to provide data about branch-level information of deposits and loans by currencies. The targeted commercial banks and MFIs are presented in Table 4.1. In the implementation of this survey, we requested the targeted financial institutions to prepare a consolidated financial statement and branch-level financial statements—each branch-level financial statement includes three types of reports: balance sheet; income statement; and information of interest rate and fee changes—and we collected those reports for five years: 2013, 2014, 2015, 2016, and 2017.

However, there are some limitations in our data. Some commercial banks did not respond or rejected our request to provide the reports. The final sample included nine commercial banks and 12 microfinance institutions (Table 4.1). Note that some branches do not keep a record of financial activities because the branch is open as a liaison office, or the data are only collected at a higher level of branches. Thus, the number of reports we collected is different from the number of branches reported in the NBC's annual report. Although 21 financial institutions provided data to us, some of them only provided data about deposits and loans. This is partly because some financial institutions do

not keep data on income statements at branch level, and also partly because it takes too much time to fill out all the information for all branches.

Following Aiba and Sok (2017), we analyzed this branch-level financial data to investigate the regional differences and dynamics in the dollarization of deposits and loans. As argued by Duma (2011), there may be differences in industrial structures between urban and rural areas. The urban economy was expected to be US dollar-based; a lot of companies make profits from services relating to tourism, and there are massive capital inflows through foreign direct investment and aid. Furthermore, the garments sector flourishes in urban areas, contributing through exports to the recent rapid growth. On the other hand, the rural areas, where the agricultural sector largely contributes to the regional growth, were expected to be a Riel-based economy. Accordingly, differences were expected in the extent of dollarization between urban and rural areas.

First, we investigated the trends in fund allocations of the Cambodian financial institutions. Recent empirical studies found that nationwide banks were likely to reallocate the funds over the country (Morgan, Rime, and Strahan 2004; Imai and Takarabe 2011; Cremers, Huang, and Sautner 2011). We investigated how the Cambodian banks reallocated funds over the country. In Figure 4.7, we present the average of total amounts of loans and deposits per branch by regions. To investigate the regional difference in dollarization, we divided the sample into seven regions: (1) Phnom Penh; (2) Siem Reap; (3) North-East Area; (4) North-West Area; (5) Central Area; (6) South-West Area; and (7) South-East Area.

Figure 4.7 shows the dynamics in KHR shares in deposits by regions from 2013 to 2017. We aggregated the amounts of loans and deposits of all the branches by regions in each currency. Because non-MDIs do not have deposits, we excluded them from this analysis. We found that amounts of loans were less than those of deposits in Phnom Penh for KHR and US dollars, and the results were the same for commercial banks and MDIs. These results indicate that Cambodian financial institutions are collecting funds basically in Phnom Penh and distributing them to rural areas.

However, this fund reallocation by banks is active for US dollars, while banks are not actively reallocating KHR funds to rural areas. Panel A shows that the amounts of US dollar loans exceeded US dollar deposits in rural areas, while the amounts of KHR loans were the same or less than the amounts of KHR deposits in rural areas. This suggests that banks are less likely to reallocate KHR funds collected in Phnom Penh to rural areas. In the meantime, MDIs were actively reallocating both excess KHR and US dollar funds from Phnom Penh to rural areas.

In the literature on branch networks, banks smooth out funding shocks in some branches/subsidiaries across banks' branch/subsidiaries network. Cremers (2011) shows that head office reallocates the excess of deposits to branches that are short of funds to extend loans. However, the reallocation behavior depends on the strategy of the banks. Some banks

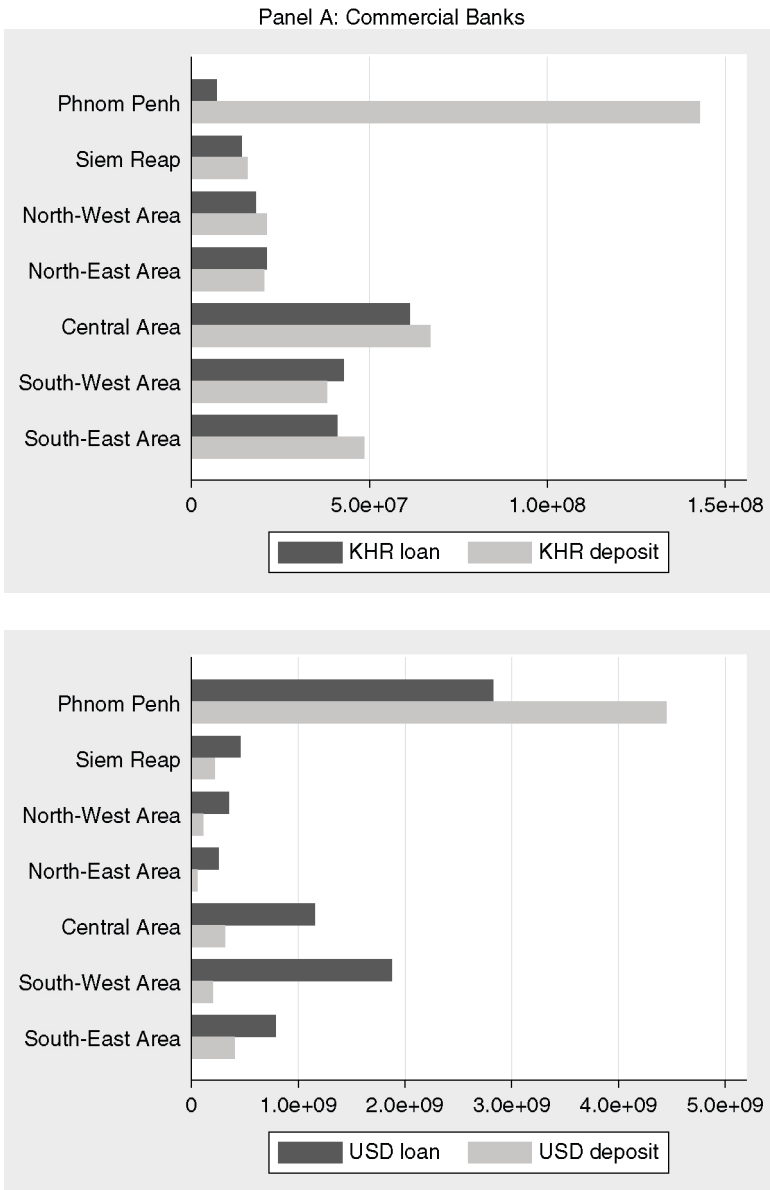

Figure 4.7 Allocations of loans and deposits

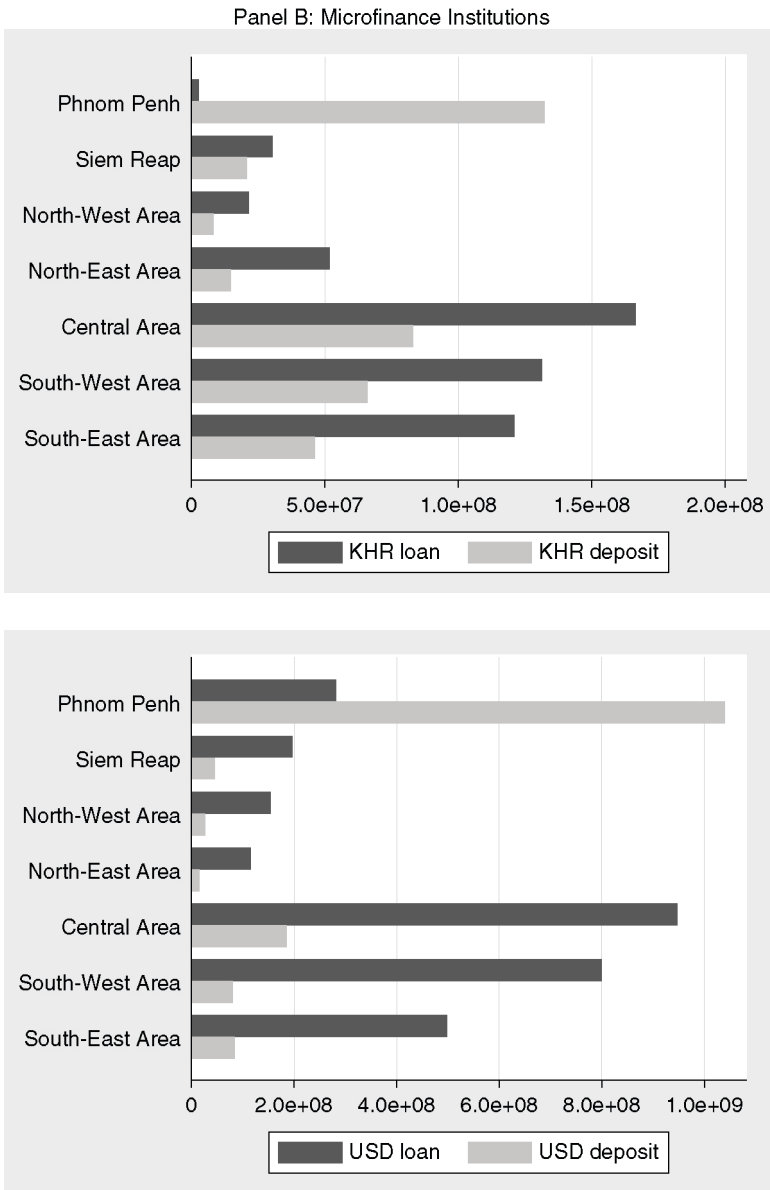

Figure 4.7 (Continued)

incentivize branches to collect deposits. In that case, the branches' lending could be dependent on amounts of deposits; it also means the financial institution is not actively reallocating the excess of deposits to the branches that need more funds in order to extend loans. Taking advantage of the panel structure of our data, we examined whether branches' lending was constrained by amounts of deposits, using the following equation:

$$\ln Loan_{it} = \alpha + \beta \ln Deposit_{it} + \text{u_i}\ \tau_t + \varepsilon_{it}$$

Where ln $Deposit_{it}$ represents logarithm of deposits in branch i at period t; $lnLoan_{it}$ represents the logarithm of loans in branch i at period t; u_i is branch-fixed effect; τ_t is a time-fixed effect and ε_{it} is white noise. If β is estimated as positive and high, branch lending is constrained by the availability of deposits in the branches.

The results are presented in Table 4.2. Since the lending behavior of branches is different in urban areas, and our interest is in how financial institutions reallocate to rural areas, we estimated this equation without the branches in Phnom Penh. Estimated coefficients are presented in the table, and standard errors are presented in parentheses. We estimated the equation for US dollars and KHR, respectively. We found that the coefficients of deposits (β) are estimated as positive at 1% statistical significance for the US dollar and KHR in the cases of both the banks and MDIs. This suggests that lending by

Table 4.2 Sensitivity analysis of loans to deposits in rural branches

	Commercial banks		*MDIs*	
	KHR	*USD*	*KHR*	*USD*
Log. deposit in KHR	0.648***		0.240***	
	(0.13)		(0.02)	
Log. deposit in USD		0.629***		0.152***
		(0.08)		(0.02)
Year dummies				
Year 2014	-0.262***	0.075***	0.065	0.609***
	(0.12)	0.08	(0.07)	(0.08)
Year 2015	-0.185	0.315***	0.038	0.654***
	(0.14)	(0.06)	(0.07)	(0.05)
Year 2016	-0.096	0.387***	-0.143	0.842***
	(0.16)	(0.06)	(0.08)	(0.05)
Year 2017	0.137	0.361***	-0.039	1.123***
	(0.19)	(0.08)	(0.09)	(0.05)
Constant	6.303***	5.885***	10.127***	11.552***
	(0.71)	(1.14)	(0.11)	(0.28)
Adjusted-R-square	0.89	0.77	0.58	0.69
Observations	480	819	3230	3396

Note: Branch-level Dummiese are also included but not reported in the table. The standard errors are calculated using white-robust estimators.

the branches of both banks and MDIs is to some extent dependent on how much they collect as deposits in the branches. Importantly, the coefficient β is higher for banks than MDIs, suggesting that this behavior is stronger for commercial banks, and MDIs are more actively reallocating the excess of deposits likely to occur in Phnom Penh to rural areas.

It is noteworthy that the estimated coefficients of year dummies are statistically significant, and the coefficients are increasing over the period, even though we controlled for the effect of increases in deposits. Furthermore, this was not the case in KHR for both commercial banks and MDIs. This suggests that there are some factors increasing lending in US dollars in rural areas over the country.

4.4.3 Analysis of Cash Transfers

To understand how US dollar currency circulates across the country, we collected data on cash transfers between NBC headquarters and NBC branches. The cash transfers between NBC branches and NBC headquarters represent the flow of cash from areas short of cash to areas with excess cash. Regional branches of banks and MDIs generally deposit their cash in NBC branches. To satisfy their client's need for cash transfers by households and enterprises and for extending loans, banks and MDIs use the NBC branch network to transfer money instead of physically carrying cash to their other branches.

Figure 4.8 shows the trends in the amounts of cash transferred from branches and transferred to branches by currencies. During the observation

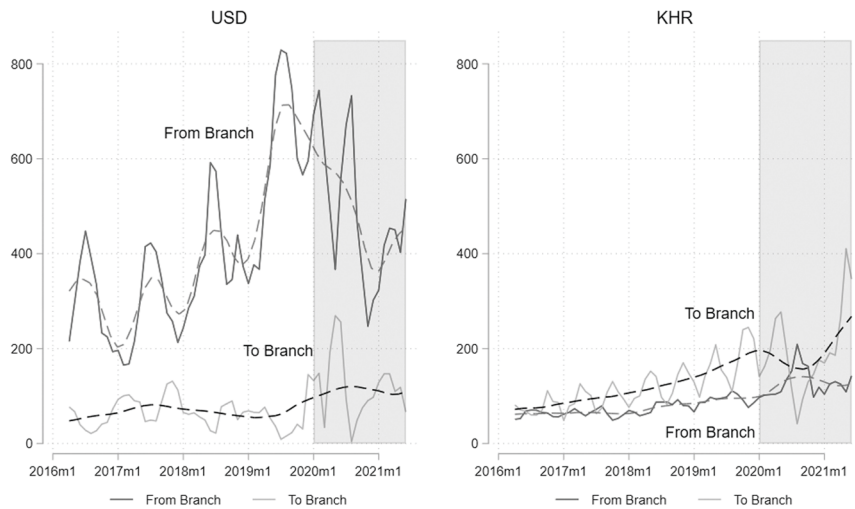

Figure 4.8 Cash transfer from branches and to branches over the period

period, the amounts of US dollar cash transferred from branches to headquarters was much larger than the US dollar cash transferred from headquarter to branches. In the meantime, for KHR the trend is the opposite. the amounts of KHR cash transferred from branches to headquarters is smaller than the KHR cash transferred from headquarter to branches. This suggests that US dollar cash is in excess in the provincial areas where NBC branches are located, while the demand for KHR cash exceeds the supply of KHR, and demand has been increasing over the period.

Interestingly, the trend of cash transfers between KHR and US dollars during the COVID-19 pandemic was different. The amount of US dollars transferred from branches to headquarters decreased significantly during the pandemic. This possibly suggests that US dollar cash stopped flowing into the provincial areas during the pandemic, as the tourist flow stopped and cross-border business transaction declined. In the meantime, the amount of KHR cash transferred from headquarters to branches decreased during the pandemic. This has been a government cash transfer since June 2020. Thus, the decline in KHR cash transfer to branches means people received enough KHR cash through the government's COVID-19 response measures.

Figure 4.9 shows the net amount of cash transferred from NBC branches to NBC headquarters. Even though most regions experienced a decline in the net amount of US dollar cash transfer from branches to headquarters, the Central areas show steady growth in US dollar cash transfers. In 2019, there were large US dollar cash transfers from branches to headquarters in the South-West Area. In particular, Sihanoukville Province significantly contributed to this large net amount of transfer. There was also large Chinese investment in this area, which might have contributed to the significant increases in US dollar cash transfers.

4.5 Conclusion and Policy Implications

The dollarization of the Cambodian financial sector has been referred to as extreme, with about 93% of foreign currency deposits as percentages of total deposits and almost 99% of foreign currency loans as percentages of total loans in the entire banking sector in the early 2010s. However, dollarization in the Cambodian financial sector has been greatly improved in the late 2010s, owing to the recent NBC policy for promotion of the local currency.

Using various sources of data, this chapter investigated the situation of the current dollarization in financial institutions from various perspectives. We found that KHR deposits in commercial banks have also increased along with increases in KHR loans. This might reflect that the NBC's 10% KHR loan policy also pushed the banks to start collecting KHR deposits more actively. In the meantime, increases in KHR deposits in MDIs have slowed down in the late 2010s, and shares of foreign currency in MDI deposits have increased.

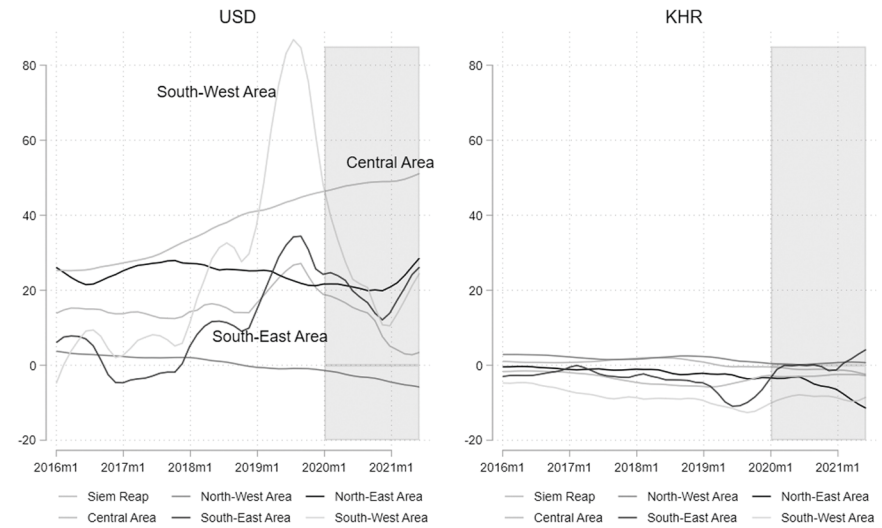

Figure 4.9 Net amount of transported cash from branches to headquarter (by areas)

Note: The figure shows net amounts of cash transfer from headquarter to branches of NBC as of 2019. Unit is millions of US dollars. The North-East Area includes Kratie, Modul Kiri, Ratanak Kiri, and Stung Treng; the North-West Area includes Banteay Meanchey, Otdar Meanchey, and Preah Vihear; the Central Area includes Kampong Cham, Kampong Chhnang, Kampong Speu, Kampong Thom, and Kandal; the South-East Area includes Kampot, Kep, Prey Veng, Svay Rieng, Takeo, and Tboung Khmum; and the South-West Area includes Koh Kong, Preah Sihanouk, Pursat, Battambang, and Pailin.

This is possibly due to the interest rate cap policy. Since MDIs require funds at low prices, they started shifting to collect more US dollar deposits. Since MDI clients generally demand KHR loans, currency mismatches in the balance sheet of MFIs could be a risk in the financial sector. Looking at the circulation of US dollars and KRH cash in the country, we found that large amounts of US dollar cash are transferred from NBC branches to headquarters, while KHR cash is mainly transferred from headquarters to branches. This suggests that a large amount of US dollar cash is circulating to provincial areas, but if the US dollar cash is in excess and deposited at financial institutions, it is then sent to the NBC. In addition, KHR cash transfers have increased year by year, suggesting that the demand for KHR cash in provincial areas has increased.

Recently, the National Bank of Cambodia implemented several policy measures to promote KHR currency. However, there are still bottlenecks, mainly because of a lack of detailed data. Our analysis in this chapter has provided evidence to support the policy implementation of the National Bank

of Cambodia, and additional insights to make further measures covering KHR currency in the financial sector effective and efficient. For the policy-making perspectives, we draw several policy implications in our analysis.

4.5.1 Further Development of the KHR Loan Market is Urgent

Firms borrow funds mostly in US dollars, even though some of them use KHR as the main currency in their operations. Financial institutions, in particular commercial banks, are passing the risk of currency mismatches to firms by aggressively lending in US dollars. Some firms take care of exchange rate risks, but others do not care even if currency mismatch risks could occur (Okuda and Aiba 2018). In countries that experienced successful de-dollarization, some measures have been implemented to incentivize financial institutions to collect local currency deposits and lend money in local currencies. For example, Peru reduced the ratio of foreign exchange deposits to M2 by 28%. In the period 2001–2010, Bolivia, Uruguay, and Paraguay also reduced dollarization by 42%, 15% and 53% in the same period, respectively. Thus, some effective measures set the rate of reserve requirements for foreign currency at a higher level than that of local currency, and gradually increase it, and set the interest rate on reserves in foreign currency lower than the rate on the local currency.

4.5.2 Develop a Database to Measure Dollarization at Branch Level

The promotion of local currency requires the enhancement of monitoring of financial dollarization. The central bank is required to carefully monitor the extent of regional dollarization by collecting data on loans and deposits at the regional level. Financial institutions are key players in the promotion of the use of KHR in the country, but they can also discourage the use of KHR. Monitoring is also necessary to detect the negative side-effects of policy measures and to reduce these even if an unanticipated situation happens.

Such a strong stance of government on monitoring the use of KHR and US dollars could also work as discipline for financial institutions to keep records properly and to shift toward using KHR currency. In the case of Poland, the country successfully eliminated foreign currency in the 1990s. In the process of such elimination, the government enhances the document review and on-site inspection to monitor foreign exchange rate risks and improve the customer's awareness of risks.

4.5.3 Supporting Measures are Needed for MFIs to Collect KHR Deposits

The 18% interest rate cap policy curbed growths of KHR deposits for MFIs, due to a relative high interest rate on KHR deposits. Since the MFI borrowers are low-income households in rural areas, there may be higher demands for KHR loans from MFIs. However, the recent interest rate cap policy made

it necessary for MFIs to collect cheap funds to extend loans, leading to an increase in the US dollar deposits of MFIs. Supporting measures beyond LCPO should be introduced to increase the availability of KHR funds at cheap price for MFIs.

Notes

1 However, the reverse trend has been observed in recent years. High-denomination banknotes are increasing in popularity as a medium of exchange and store of value, thanks largely to the availability of the notes in ATMs and the improvement in their quality.
2 Aiba et al. (2021) and Samreth et al. (2021) investigated the impact of interest rate cap policy on MFI lending. For the detail of interest rate cap policy, see their studies.

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Appendix 4.1: Historical Table of NBC Policy Relating to dollarization

Jun. 2008	Reserve requirement ratio for foreign currency deposits was increased from 8% to 16%.
Jan. 2009	Reserve requirement ratio for foreign currency deposits was reduced from 16% to 12%.
Sep. 2012	Reserve requirement ratio for foreign currency deposits was increased from 12% to 12.5%.
Mar. 2015	The NBC increased the reserve requirement ratio for foreign wholesale borrowing from 0% to 12.5%.
Dec. 2016	The NBC announced the introduction of 10% KHR Loan Portfolio Policy at the end of 2019.
Apr. 2017	Interest rate cap on lending at annual rate of 18% was introduced to MFIs and rural credit operators.
Jan. 2020	10% KHR Loan Portfolio Policy effective.
Apr. 2020	Reserve requirement ratio for foreign currency deposits and borrowing reduced to 8%.
Sep. 2020	The NBC started charging fees when financial institutions deposit small-denomination US banknotes ($1, $5, and $10) in the NBC.

5 Currency Exchange Under Payments Dollarization

Vichet Sam and Koji Kubo

5.1 Introduction

Payments dollarization is the phenomenon whereby a foreign currency is used in parallel with the home currency as a medium of exchange for domestic transactions. Cambodia is known for its common use of US dollar banknotes for payments (De Zamaroczy and Sa 2002). In 1975, the country's Khmer Rouge regime abolished the home currency to establish a society of primitive communism. Although the advent of a new administration in 1979 terminated this radical experiment, the subsequent political and economic turmoil called for large-scale multilateral aid programs for the reconstruction of the nation, which were implemented along with vast inflows of US dollar banknotes to the extent that the US dollar took the position of vehicle currency[1] in domestic transactions (Okuda 2017). To revive the use of the home currency, Khmer riel (KHR), authorities have introduced various measures, including a regulation allowing tax payments only in the home currency (Duma 2011).

Mixed uses of US dollars and KHR for payments in domestic transactions have led to pervasive currency exchange through third parties, such as money changers, as currency mismatch between revenue and expenditure arises across firms and individuals, which causes an economy-wide efficiency loss. Meanwhile, efforts by the authorities to promote the use of the home currency have begun to come to fruition. The ratio of KHR currency in circulation to gross domestic products (GDP) has risen from below 5% in the early 2000s to 12.9% by 2020. At the same time, the transition from a state of high dollarization to moderate dollarization with increased interactions between US dollar users and KHR users may encompass more currency mismatch among them. Paradoxically, the resurgence of the home currency in recent years may transitionally aggravate the need for currency exchange given the existing prevalence of US dollar banknotes in the economy.[2]

Although a large body of literature scrutinizes the benefits and costs of dollarization, the cost of currency exchange associated with payments dollarization has largely been neglected. Perhaps this lacuna in the dollarization literature is due to both the rarity of payments dollarization to a high degree

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as in Cambodia and the lack of a firm-level dataset necessary for empirical analyses. Our study aims to fill the gap in the literature through an empirical analysis of currency exchange in the highly dollarized Cambodian economy using a firm-level dataset.

Inspired by the empirical research by Demirguc-Kunt et al. (2011) on the relationship between migrant workers' remittances and financial development, our study places a focus on firms' choice of banks versus money changers for currency exchange. Demirguc-Kunt et al. (2011) demonstrated that channeling remittances through banks is conducive to expanding the breadth and depth of banking services that have contributed to financial development in Mexico. Given the comparability of money transfer and currency exchange as auxiliary services of commercial banks, the promotion of the use of banks for currency exchange deserves attention from policy-makers. In a joint project, the National Bank of Cambodia (NBC) and Japan International Corporation Agency (JICA) Research Institute conducted a survey of firms on their uses of the home and foreign currencies in their businesses in 2017, which provides a nationally representative dataset. This unique dataset allows us to validate the conditions of payments dollarization and the realities of currency exchange practices in the country.

This chapter is structured as follows. Section 5.2 outlines the state of payments dollarization in Cambodia, with a particular focus on currency exchange, money changers, and firms' payment methods, while section 5.3 offers a review of the related literature. The paucity of research on currency exchange in the dollarization literature led us to develop our research framework based on two neighboring fields of financial economics: (1) remittances of migrant workers; and (2) payment methods. Section 5.4 presents the data, articulates the hypotheses on firms' choice of currency exchange methods, and illustrates the empirical methodology; section 5.5 presents the empirical results and interpretation; and section 5.6 summarizes the findings and offers some concluding remarks of this study.

5.2 Money Changers in a Dollarized Economy

5.2.1 Payments Dollarization and Currency Exchange in Cambodia

As illustrated in Chapter 1, Cambodia is one of the most dollarized economies in the world, measured by the ratios of foreign currency deposits (FCDs) to broad money (M2) and to total deposits. These indices, however, might mask the true degree of dollarization in Cambodia, given that US dollar banknotes—a widespread means of payment in the country—are not counted.

Payments dollarization represents the use of foreign currency as a medium of exchange. Payment currency choice encompasses network externalities where it is efficient for firms and individuals to hold the currency that is accepted by other agents. Due to these network externalities, payments

dollarization exhibits hysteresis even after high inflation—the original cause of dollarization—has subsided (Oomes 2003; Uribe 1997; Valev 2010).

Pervasive uses of US dollar banknotes for payments are not uniform across Cambodia; on the contrary, the country's economy is divided into the dollar-based urban economy and the Riel-based rural agricultural economy (Duma 2011). Within both the urban and rural economies, the currency of settlement tends to vary by commodity and service; house rent is more often paid in US dollars, whereas food expenditure tends to be settled in KHR (Odajima 2017).

The use of multiple currencies in Cambodia has created a currency mismatch between revenues and expenditures among economic agents, which will be illustrated with our original survey data in section 5.4. Moreover, mixed use of the home and foreign currencies for payments entails currency exchange at a third party, such as a money changer or bank. In Cambodia, although sellers usually accept payments in a currency other than the invoice currency, they often convert prices using discretionary exchange rates that are unfavorable to buyers, so that buyers adhere to making payments in the currency of pricing, taking the burden of currency exchange.

5.2.2 Banks and Money Changers in the Currency Exchange Business

Regarding Cambodia's foreign exchange market, major players include banks and money changers. The Law of Foreign Exchange (August 1997) stipulates that banks, as authorized intermediaries, are permitted to undertake any foreign exchange operations with residents and non-residents, including purchases and sales of foreign exchange and international payments. Sixty-three banks were in operation as of December 2020. Compared with banks, money changers' scope of business is limited in two regards. First, money changers are not permitted to make international payments; thus, their role in international trade is marginal.[3] Second, money changers are not licensed for deposit and loan services. As such, money changers have fewer economies of scope than banks.

Money changers are classified into three types: licensed money changers, authorized money changers, and unofficial (informal) money changers. The Prakas (Directive) on Money Changer Licenses or Authorization (October 2009) stipulates that licensed and authorized money changers are permitted to sell and buy foreign currency banknotes and buy traveler checks. In Phnom Penh Capital City, there were 26 licensed money changers and 84 authorized money changers as of December 2020. In provinces, there were no licensed money changers but as of December 2020 there were 2,772 authorized money changers (Table 5.1). Apart from licensed and authorized money changers, there are numerous unofficial money changers all over the country.

Among currency exchange service providers, why are money changers seemingly preferred over banks? Money changers open for longer hours near major wholesale markets, and they have a longer track record of currency

Table 5.1 Branch networks of banks and money changers

		Number of outlets (as of December 2020)		
		Phnom Penh	*Provinces*	*Total*
Banks				
	Commercial banks	381	908	1,289
	Specialized banks	21	11	32
Total		402	919	1,321
Money changers				
	Licensed	26	0	26
	Authorized	84	2,772	2,856
Total		110	2,772	2,882

Source: National Bank of Cambodia's Supervision Annual Report 2020.

exchange business than do banks. Banks—especially foreign-invested banks—concentrate on US dollar-denominated financial intermediation, which ensures their mitigation of currency mismatch in their balance sheets (Okuda 2017). The lack of an efficient wholesale foreign exchange market and the absence of swap markets might also be a factor that discourages some banks to offer competitive exchange rates, given their difficulty in accessing a great amount of currencies when needed and in hedging against foreign exchange risks. As such, the perception of the general public is that money changers offer more competitive rates for currency exchange services compared with banks.

Despite this perception, however, the difference in exchange rates between money changers and banks has diminished over time. According to our observations of exchange rates at 20 money changers and banks in the central districts of Phnom Penh,[4] the narrowest spread offered by a money changer was KHR 6, with the US dollar buying rate at KHR 4,098 and the selling rate at KHR 4,104.[5] Money changers' spreads varied from KHR 6 to KHR 15. By contrast, banks' spreads ranged from KHR 12 to KHR 35. While some banks do not offer competitive money change services and instead incline to US dollar-denominated financial intermediation,[6] other banks such as ACLEDA Bank, stretching their scope of business into KHR deposits and loans, post competitive exchange rates at branches and online to attract customers. The difference between the best exchange rates of money changers and those of some banks was no more than 0.2% of the value of one US dollar.

5.2.3 Money Changers and Central Bank Auctions

Before the COVID-19 pandemic, the NBC held one-way auctions to sell KHR and buy US dollars, which enabled the financial authorities to absorb US dollar liquidity and inject KHR into the economy toward de-dollarization. The auction also equipped the central bank to alleviate the appreciation of KHR vis-à-vis the US dollar. In 2020 and 2021, however, a decline in demand

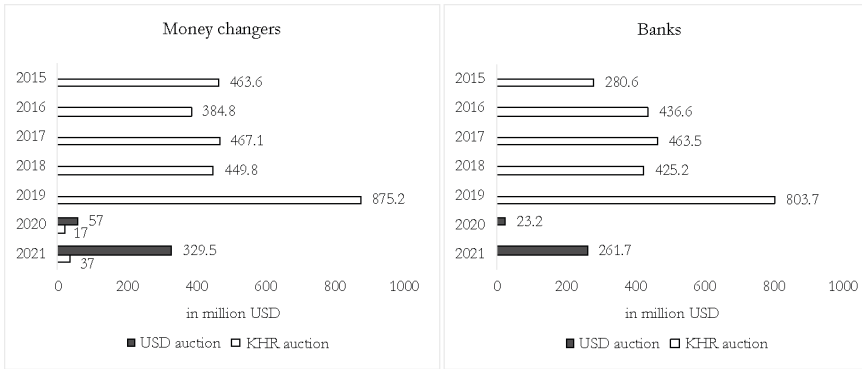

Figure 5.1 KHR and USD auctions (in US dollars, million) by the NBC

for KHR due to the slowdown in domestic economic activities and the slower capital inflows put pressure on the depreciation of KHR, compelling the NBC to cut the KHR auctions and sell US dollars to stabilize the exchange rate. Given Cambodia's underdeveloped financial system, the auction thus constitutes NBC's primary instrument for monetary and foreign exchange policies.

A peculiar feature of the Cambodian financial market is that the central bank deals directly with money changers other than banks.[7] Licensed money changers are entitled to bid in the NBC auctions, where they replenish KHR liquidity to sell to their customers. They are required to deposit at NBC a minimum paid-up capital of KHR 80 million (approximately US$20,000) and pay an annual license fee of KHR 1.2 million (US$300). Authorized money changers are exempted from compulsory deposits, but they are not eligible to participate in the NBC auctions, either.

The auction data clearly demonstrate the significance of money changers in the foreign exchange market in comparison to banks (Figure 5.1). Except for 2016, money changers overwhelmed the auctions; hence, a considerable amount of KHR liquidity flowed from NBC via money changers to non-financial enterprises and households. Between 2015 and 2019, the size of KHR auctions with money changers equaled, on average, 25.6 percent of currency outside depository corporations.

5.2.4 Firms' Payment Methods in Cambodia

Confronted with the pervasive cash payments in the economy, the NBC has striven to develop digital and non-cash payment infrastructure over the past two decades.[8] For instance, the NBC implemented the National Clearing House modernization with the adoption of check standard in 2008 and the

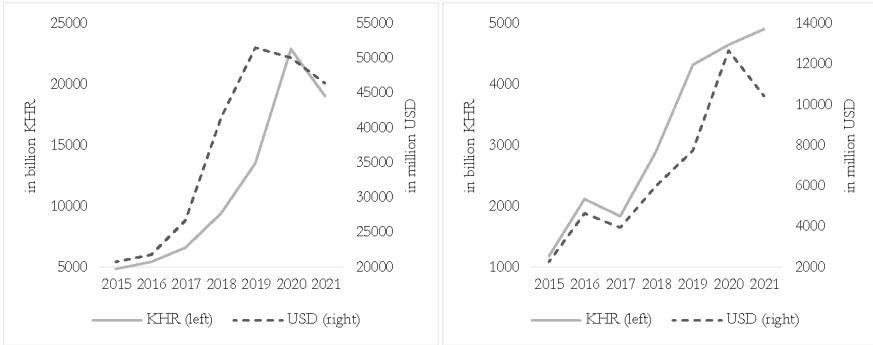

Figure 5.2 Checks (left) and electronic payment orders (right) transactions in value through National Clearing System

introduction of payment order format for credit remittance in 2010. To facilitate fund transfer service in Khmer Riel across commercial banks and microfinance deposit-taking institutions within the country, the Fast Payment system was introduced in 2016 and, more recently, the Bakong payment system that uses Blockchain technology was launched, addressing the issues of interconnectivity and interoperability across platforms of payment operators.[9] Owing to these efforts, the use of non-cash and electronic payments has increased significantly in recent years. Using data from the National Clearing System (NCS), Figure 5.2 shows that checks and fund transfers have become a popular means of payment, especially among firms.[10]

The use of non-cash payments may lead to the promotion of local currency usage because it could lower the cost of using KHR in large payments. Odajima et al. (2019) find that people are less likely to use the local currency for large transactions as it requires a larger volume of banknotes compared with payments in US dollars. Despite the development of digital and non-cash payment infrastructure, however, the data from our original survey indicates the persistent use of cash, particularly among micro, small, and medium enterprises (MSMEs), as discussed in section 5.4.

The widespread use of cash might be a reason for firms to prefer money changers over banks for their currency exchange, which is an argument we will prove in the rest of this chapter. If firms' currency exchanges are seized by banks, it may serve as a catalyst for further financial development because it may encourage firms to use other banking services, and banks may be able to capture more information on firms' operation, which alleviates the problem of asymmetric information. Meanwhile, currency exchange at banks would provide the authorities with more standardized and accurate data about foreign exchange transactions, allowing them to devise more appropriate measures for de-dollarizing the economy.

5.3 Related Literature

Currency exchanges and money changers are rarely studied in economics literature, perhaps because of their minor position in the foreign exchange market.[11] In most countries, apart from retail services for foreign visitors, currency exchange transactions are embedded in cross-border payments for trade and investment, which commercial banks deal with through designated international payment systems (World Bank 2018). Non-cash-based transactions by such banks are central to the foreign exchange market. By contrast, due to payments dollarization, Cambodia's foreign exchange market is overshadowed by cash-based, retail transactions of money changers (IMF 2012, 2017). In view of the absence of existing studies on currency exchange or money changers in the literature, this chapter refers to two neighboring fields of the financial economics literature: (1) remittances of migrant workers; and (2) payment method choices, which allows us to justify the promotion of currency exchange at banks and to develop the framework for empirical analysis.

Justification for banks' capture of currency exchange services can be obtained from existing studies on remittances to developing countries from migrant workers. Demirguc-Kunt et al. (2011) articulate three reasons why channeling remittances through banks exerts positive impacts on the breadth and depth of banking services, and their empirical research validates that remittances have contributed to financial development in Mexico. First, whatever their purposes are, remittance recipients' visits give banks opportunities to offer financial services such as deposits. They also add to the financial inclusion of the unbanked population. Second, the fees collected for currency exchange services help banks to expand the branch network and extend the outreach. Third, recipients' visits provide banks with information on their financial flows, which helps banks to determine the creditworthiness of customers and grant loans. When the same logic applies to currency exchange at banks, the transition from money changers to banks deserves the attention of the authorities.

Concerning the design of the empirical analysis, a strand of the financial economics literature on payment methods provides an insight into firms' choices of currency exchange methods. Payment methods, as Hancock and Humphrey (1997) summarize, depend largely on the size and purpose; in general, cash is the preferred means of payments for small-sized, point-of-sale consumers' settlements, whereas bank transfers and bank drafts are elected for large-scale, business-to-business settlements among firms. Individuals and firms typically choose payment methods that reduce the associated transaction costs and achieve the highest utility, given their preferences in terms of pecuniary costs, time, and risk.

In the literature on payment methods, an increasing number of empirical studies address consumer cash payments that persist despite the development of alternative payment methods such as credit cards, debit cards, and other cashless options. Recent empirical research utilizes shopping diary surveys, which collect transaction-level records on consumers' choices of payment

methods between cash and alternatives. Survey respondents keep records of the payment method for every transaction during the survey period, and their behavioral records are matched with their demographic information and the circumstantial records of payments, which constitute the data for the analysis on how consumers determine payment methods.

The costs of payment instruments are found to be one of the significant determinants when consumers choose payment methods. In an analysis of a US consumers' shopping diary survey, Stavins (2018) examined the influence of price incentives, such as discounts for cash payments, and found that consumers adjusted their payment methods elastically with respect to the changing costs of payment instruments. Likewise, Ching and Hayashi (2010) show evidence that Canadian consumers are responsive to rewards of payment cards. Analogously, Bolt et al. (2010) present the result of the analysis of Dutch survey data that demonstrated surcharges on debit cards induced consumers to switch to cash. Overall, these empirical studies indicate that consumers' demand for a specific payment instrument is elastic with respect to the costs and price incentives.[12]

Demographic traits are other significant factors that affect consumers' choice of payment methods. The empirical results from a Dutch shopping diary survey by Kosse and Jansen (2013) suggest that first-generation immigrants from developing countries are more likely to pay in cash, but their preferences are not inherited by their descendants. Wakamori and Welte (2017) show that the elasticity for cash payment demand with respect to the cost of alternatives is low, implying that personal preferences dictate consumers' payment instrument choices.

Furthermore, the perception of a payment instrument rather than its actual usability influences consumers' decisions (Arango et al. 2014). When consumers are not certain whether cards are accepted, they tend to pay in cash without confirming, which is particularly the case for small-value point-of-sale payments. Rather than actual (non-)acceptance, consumers' perception guides their choice of payment instruments.

Our subsequent analysis of firms' choice of currency exchange methods draws on these existing studies on payment methods. Empirical models are constructed in which firms choose between banks and alternative methods based on the transaction cost and convenience, and their perceptions of various exchange methods.

5.4 Data and Methodology

5.4.1 Data

This chapter employs the data from the second-round NBC-JICA survey[13] on dollarization entitled "An Empirical Study on Promotion of Home Currency in Cambodia." This second survey was conducted during the period from July 2017 to December 2017 with the aim of constructing a panel dataset

on the behavior of Cambodian firms concerning their uses of the home and foreign currencies. Questions on currency exchange practices were added to the second survey. The survey adopted stratified random sampling with strata defined by firm size and province to replicate the distribution of firms recorded in the country's Economic Census in 2011. The survey interviewed a total of 856 firms across four firm size categories in 25 provinces, which established a nationally representative sample. The four-firm size categories by asset size consisted of micro firms (with assets below US$50,000), small (between US$50,000 and US$250,000), medium (between US$250,000 and US$500,000), and large (above US$500,000).

Although the survey primarily investigated the impact of dollarization on firms' financing, its structured questionnaire covered key information pertinent to firms' currency exchange and payment methods. Specifically, our data include firms' choice of currency exchange methods, their perceptions and criteria for currency exchange, and payment instruments. Payment methods alternative to cash include bank transfers and bank drafts. Currency exchange methods are classified into five categories: (1) banks; (2) microfinance institutions (MFIs); (3) licensed and authorized money changers; (4) informal brokers including unauthorized money changers and shopkeepers; and (5) family and friends.

Currency mismatch

Currency mismatch between revenues and expenditures at each firm is a root cause of the burden of currency exchange in a partially dollarized economy. Applying the method of Aiba and Tha (2017)[14] to the data of the 2017 NBC-JICA enterprise survey, we illustrate pervasive currency mismatch among Cambodia firms in Figure 5.3.

Our dataset confirms a strong correlation between currency mismatch and uses of currency exchange. From Figure 5.3, firms are classified into four categories of currency mismatch: a strong currency mismatch if the surplus (deficit) of their foreign exchange currency exceeds 50% of the total sales; a moderate mismatch if the surplus (deficit) is between 25% and 50%, a weak mismatch if the surplus (deficit) is below 25% but not zero; and a match if the surplus is zero. Table 5.2 shows that the proportion of firms that engage in currency exchange increases along with the degree of mismatch.

Methods of currency exchange

Table 5.3 illustrates that informal and formal money changers are more popular than banks and MFIs, perhaps due to the ubiquity of money changers across the country—particularly the informal ones. In our dataset, the number of firms that do not engage in currency exchange is 170. The total number of observations in Table 5.3 is equal to 960, higher than the total sample size of 856 firms, because some firms exchange their currency at more than one place, which we should take into account in our subsequent analysis.

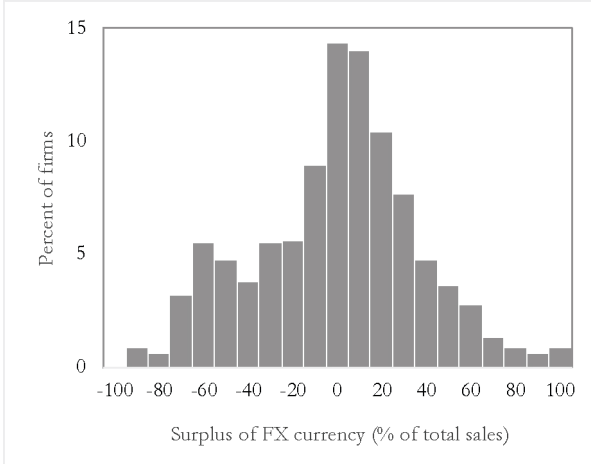

Figure 5.3 Currency mismatch between firms' revenue and expenditure

Table 5.2 Number of firms with currency mismatch and currency exchange

Degree of currency mismatch	*Currency exchange*		
	No (%)	*Yes (%)*	*Total (%)*
Match	12 (41.4)	17 (58.6)	29 (100)
Weak mismatch	95 (27.5)	250 (72.5)	345 (100)
Moderate mismatch	22 (14.8)	149 (85.2)	171 (100)
Strong mismatch	13 (9.8)	133 (90.2)	146 (100)
Total	142 (20.5)	549 (79.5)	691[19] (100)

Table 5.3 Currency exchange methods

Currency exchange method	*Number of firms*
Banks	148
MFIs	3
Formal money changers	256
Informal money changers	362
Family or friends	21
No exchange	170
Total observations	960

Source: NBC-JICA survey in 2017, authors' calculation.

Table 5.4 Reclassification of currency exchange methods

Currency exchange methods	*Number of Firms*	*Percentage*
Banks only (A)	64	7.5
Money changers only (B)	517	60.4
Banks and money changers (C)	86	10.0
No exchange at banks or money changers (D)	189	22.1
Total	856	100

Source: NBC-JICA survey in 2017, authors' calculation.

To simplify our analysis with a focus on factors that influence firms' decision to select currency exchange at banks over other options, particularly money changers, we reclassify the currency exchange methods in three main groups: (1) currency exchange at banks, which actually includes banks and MFIs; (2) currency exchange at money changers, which includes formal and informal money changers; and (3) no exchange at either banks or money changers, which includes firms that do not exchange currency and those that exchange with their family or friends given the small proportion of this last category to be treated as another main group. This reclassification leads us to derive Table 5.4, in which 64 firms exchange their currency at banks only while 517 firms, or around 60.4% of the sample firms, exchange their currency at money changers only. There are 86 firms that exchange currency at both banks and money changers, suggesting that these two places do not perfectly substitute for each other in firms' perceptions.

Table 5.5 shows firm characteristics that might influence their currency exchange choice. For instance, large firms seem to prefer banks (A) more than do smaller firms; 11.1% of large firms exchange at banks (A) against 6.3% of MSMEs. In terms of industrial sectors, firms in other sectors[15] prefer banks (A), while firms in the manufacturing and wholesale and retail trade sectors are more likely to use money changers (B) (about 65% of firms in those sectors). Regarding location, firms in rural areas seem to prefer both banks and money changers (C) more than firms in urban areas (15.6% against 7.5%). Meanwhile, the proportion of firms in Phnom Penh that do not exchange currency at a bank or money changer (D) is higher than firms in other cities or provinces (29.7% against 20.0%). Lastly, firms with deposit accounts with banks seem to exchange more at (A) compared to those without deposit accounts, yet firms with loan accounts with banks tend to prefer option (B).

Methods of payments

Among 856 interviewed firms, 122 (14.3%) and 366 firms (42.8%) have ever used checks and bank transfers respectively to pay their suppliers. Nevertheless,

Table 5.5 Firm characteristics tabulated by currency exchange choices

	Currency exchange choices				*Total*
	Banks only (A)	*Money changers only (B)*	*Banks and money changers (C)*	*No exchange at banks or money changers (D)*	
	Number of firms (percent)				
Total	64 (7.5)	517 (60.4)	86 (10.0)	189 (22.1)	856
Firm size					
MSMEs	41 (6.3)	402 (62.0)	55 (8.5)	150 (23.1)	648
Large	23 (11.1)	115 (55.3)	31 (14.9)	39 (18.8)	208
Industry					
Agriculture	1 (20.0)	2 (40.0)	1 (20.0)	1 (20.0)	5
Manufacturing	12 (8.3)	95 (65.5)	18 (12.4)	20 (13.8)	145
Wholesale and retail trade	21 (5.1)	263 (64.0)	46 (11.2)	81 (19.7)	411
Tourism	13 (6.1)	117 (54.9)	15 (7.0)	68 (31.9)	213
Other sectors	17 (20.7)	460 (48.8)	6 (7.3)	19 (23.2)	82
Location					
Urban	47 (8)	359 (61.3)	44 (7.5)	136 (23.2)	586
Rural	17 (6.3)	158 (58.5)	42 (15.6)	53 (19.6)	270
Province					
Phnom Penh	13 (7.1)	103 (56.6)	12 (6.6)	54 (29.7)	182
Other cities or provinces	51 (7.6)	414 (61.4)	74 (11.0)	135 (20.0)	674
Having a deposit account	45 (10.2)	268 (60.9)	59 (13.4)	68 (15.5)	440
No deposit account	19 (4.6)	249 (59.9)	27 (6.5)	121 (29.1)	416
Having a loan account	10 (4.7)	151 (71.2)	30 (14.2)	21 (9.9)	212
No loan account	54 (8.4)	366 (56.8)	56 (8.7)	168 (26.1)	644

Source: NBC-JICA survey in 2017, authors' calculation.

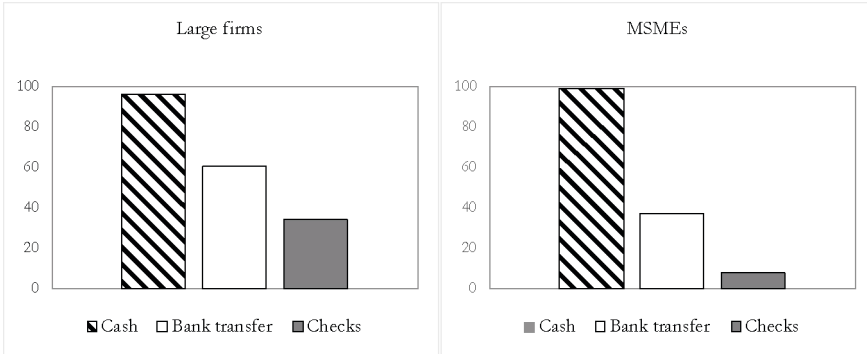

Figure 5.4 Percentage of firms that pay their suppliers in cash and non-cash

cash remains the most popular method (98.2% of firms used cash). By firm size, MSMEs used checks and bank transfers considerably less than large firms (Figure 5.4). Given that 99.8% of firms in Cambodia are MSMEs,[16] this reflects a low adoption rate for non-cash payments.

Regarding the relationship between currency exchange and payment methods, Figure 5.5 depicts the histogram of cash expenditure ratio by firm category of currency exchange practices. The vertical axis of the histogram is the percentage of firms in each category of exchange method, and the horizontal axis is the range of the cash expenditure ratio between 0 and 100%. We observe that the distribution of cash expenditure is more skewed to 100% for both Categories (B) and (D), while the distribution is more even for Categories (A) and (C). The figure suggests that firms' choice of banks versus money changers and their payment methods could be interlinked. Perhaps non-cash payment methods, such as bank transfers and bank drafts, are more compatible with currency exchange at banks. For example, when a firm with a US dollar current account makes a payment in KHR by bank transfer, it suffices for the firm to order the bank to convert a part of its account balance to KHR and instruct the account transfer. By contrast, firms that make payments in cash have to obtain banknotes of the currency designated by their suppliers, for which money changers are convenient.

Criteria for Selection of Currency Exchange Methods

The survey asks the respondents about their perceptions or criteria for selecting their preferred currency exchange methods. In a multiple-choice question, the respondents choose which of the following factors they consider important when selecting currency exchange methods: close distance, favorable rates, convenience, and security of transactions. Table 5.6 shows the survey results of perceptions/criteria tabulated by firm category of currency exchange

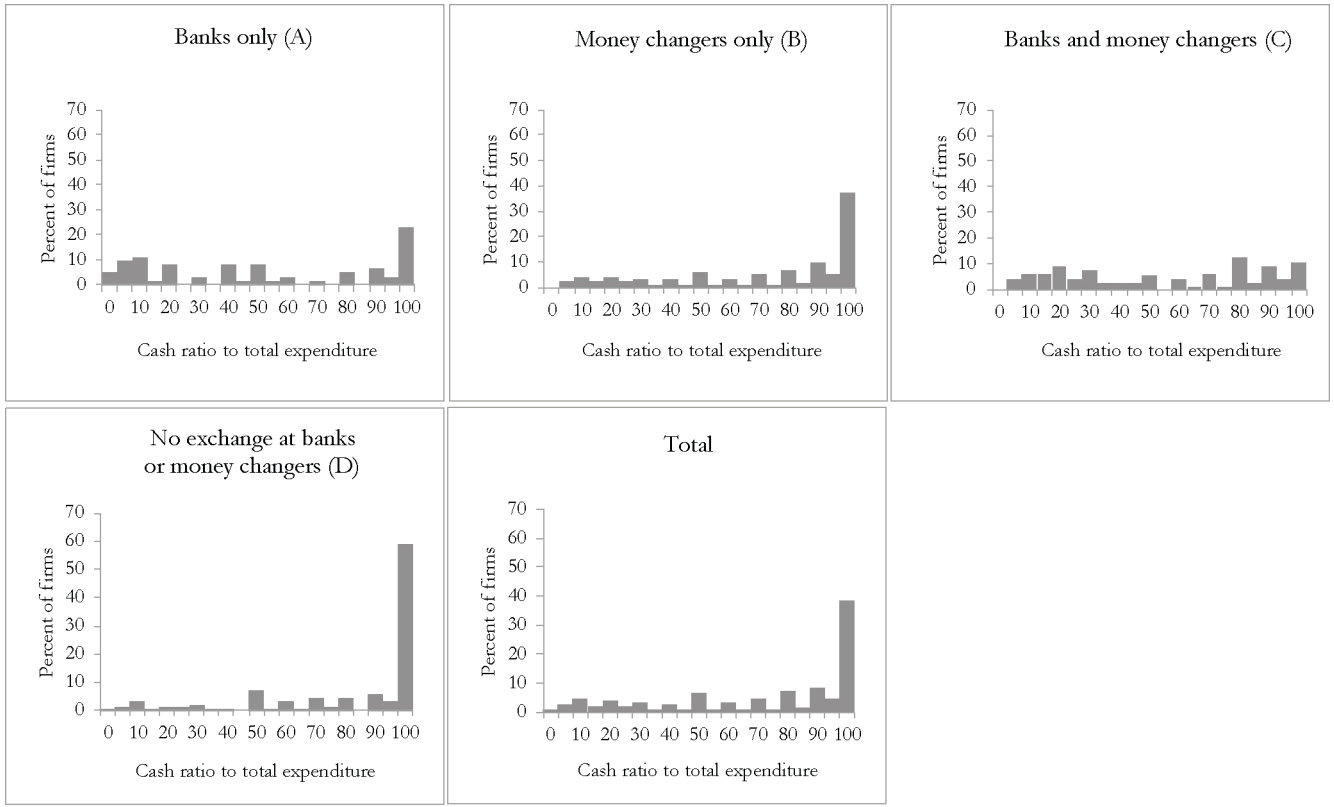

Figure 5.5 Ratio of cash expenditure to total expenditure by currency exchange choices

Table 5.6 Firms' perceptions/criteria for selecting currency exchange methods by category

	Currency exchange choice		
	Banks only (A)	*Money changers only (B)*	*Banks and money changers (C)*
Criteria:	Number of firms (percent)		
Close distance	24 (37.5)	295 (57.1)	50 (58.1)
Favorable rates	22 (34.4)	347 (67.1)	64 (74.4)
Convenience	41 (64.1)	373 (72.1)	62 (72.1)
Security	37 (57.8)	67 (13.0)	28 (32.6)
Total number of firms	64 (100)	517 (100)	86 (100)

Source: NBC-JICA survey in 2017, authors' calculation.

practices. Of the 64 firms that uses bank only (A), 64.1% and 57.8% respectively highlight convenience and secured transactions as the main criteria for using this method. Firms that use money changers (B) mostly appreciate the convenience criteria (72.1%), followed by favorable rates (67.1%) and close distance (57.1%), while only 13.0% consider secured transactions important. Lastly, firms that use both methods (C) share similar perceptions to those who use (B) with high appreciation towards favorable rates (74.4%), convenience (72.1%) and close distance (58.1%), yet they value secured transactions more highly than firms in the category (B) (32.6% against 13.0%).[17]

These findings reflect the perception of firms that money changers offer competitive exchange rates and are located closer to them, yet banks offer higher security. In addition, money changers are perceived to be more convenient than banks, yet the meaning of "convenient transactions" may not be the same across firms of different categories. Our observation during the survey suggests that formal and informal money changers are perceived as convenient because of quick transactions or tolerance to dirty and torn banknotes, whereas transactions at banks are convenient because they offer multiple services in one stop, including currency exchange, money transfers and deposits, although with longer waiting times.

5.4.2 Analytical Framework

This subsection develops working hypotheses about firms' decisions on currency exchange choices. The empirical research on payment method decisions, as referred to in section 5.3, shows that economic agents select a payment method that yields higher benefits given their preferences. Various factors, such as pecuniary costs, convenience, speed, and security, have varying weights for different consumers. More importantly, perceived (rather than actual) benefits and costs of alternative payment methods affect consumer payment

decisions (Arango et al. 2014). By the same token, it is hypothesized that firms select a currency exchange method with considerable weights on their perceived benefits and costs.

First, for firms using non-cash payment methods such as bank transfers and bank drafts, currency exchange at banks saves transaction costs because they can receive multiple financial services in one stop. Accordingly, it is hypothesized that a firm with a low ratio of cash expenditure to total expenditure is more likely to exchange currency at banks.

> **Hypothesis 1**: The lower its ratio of cash expenditure to total expenditure, the more likely a firm is to exchange currency at banks.

Second, firms have subjective perceptions of currency exchange methods, which shape the criteria for their choice. For those firms with a perception of price differences—that money changers offer more competitive rates than do other alternatives—money changers meet their criteria. Likewise, the general perception of banks offering secured transactions leads firms with a security criterion to choose banks for currency exchange.

> **Hypothesis 2**: Firms with a perception of price differences tend to choose money changers.

To investigate firms' decisions about selecting a currency exchange method, we use the bivariate probit model that captures all possible choices presented in Table 5.4 (Box 5.1).

Box 5.1 Empirical model (bivariate probit model)

As shown in Table 5.4, some firms select both banks and money changers for their currency exchange (C), while some other firms do not exchange their currency at those places at all (D); thus, it is important to construct an empirical model that captures those possible choices. Indeed, dropping those firms from the analysis (almost one-third of total firms) could lead to a sample selection bias, and it is interesting to understand why some firms prefer to exchange their currency at banks and money changers rather than selecting one of them.

In response to this objective, we use the bivariate probit model to capture currency exchange methods that consist of: (1) exchanging at banks; (2) exchanging at money changers; (3) exchanging at banks and money changers; and (4) no exchange at those places. The specification of the bivariate probit model is as follows:

$$\begin{cases} y_c = 1 & if \ y_c^* \geq 0 \\ y_c = 0 & otherwise \end{cases} \quad \forall c \in \{1, 2\}$$

$$s.t \quad \begin{cases} y_1^* = X\beta_1 + e_1 \\ y_2^* = X\beta_2 + e_2 \end{cases}$$

where X are the variables of firm characteristics and e_e are error terms that follows the joint standard normal distribution with mean zero, and Corr(e_1, e_2) equals ρ.

In this model, if $y_1 = 1 \text{ and } y_2 = 0$, this means that firms exchange currency at banks only (A). If $y_1 = 0 \text{ and } y_2 = 1$, this means that firms exchange currency at money changers only (B). If $y_1 = 1 \text{ and } y_2 = 1$, firms exchange currency at both places, banks and money changers (C). If $y_1 = 0 \text{ and } y_2 = 0$, firms do not exchange their currency at those places (D).The model also allows us dealing with potential correlation between choices in exchange method, ρ. If banks and money changers are competitive or substitutable, estimated ρ would be negative and statistically significant, which is what we expect for. In addition, if the level of competition is intensive, the absolute value of ρ would be close to one, yet it would be close to zero if the competition is weak.

5.5 Empirical results and discussion

5.5.1 Results

Regarding Hypothesis 1, there is strong evidence that firms' cash payment discourages their use of banks for currency exchange. The estimation results from Table 5.8 (see Appendix 1) suggest that a 1% increase in the cash expenditure ratio decreases the likelihood of a firm choosing banks (A) by 0.1% and increases the likelihood of choosing money changers (B) by 0.2%. To make this more apparent, we depict how the probability that firms would choose a certain currency exchange method varies according to their cash expenditure ratio[18] (Figure 5.6), and we find that the probability that firms prefer (B) increases with the cash expenditure ratio. For example, if firms make all payments in non-cash instruments, the probability equals 17.3% that they would exchange at banks (A), 50.4% that they would exchange at money changers (B), 22.8% that they would exchange at banks and money changers (C), and 9.5% that they would not exchange at those places (D). By contrast, if firms make all payments in cash, the probability equals 3.8% for (A), 77.9% for (B), 3.7% for (C), and 14.7% for (D). This result validates Hypothesis 1 that the lower ratio of cash to total expenditure, the more likely that a firm would exchange currency at banks. As such, a pragmatic approach for the authorities would be to address currency exchange and payment modernization together rather than separately.

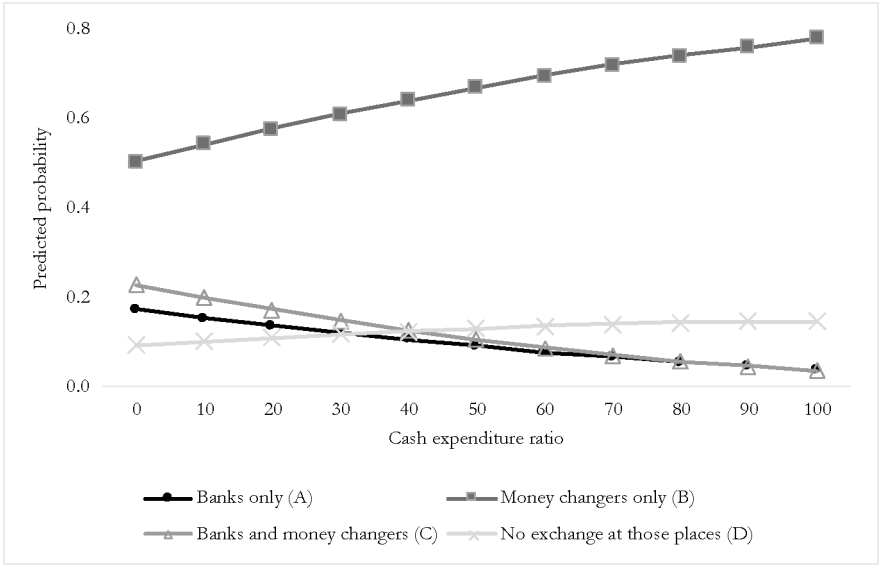

Figure 5.6 Predicted probability of currency exchange choice and cash expenditure ratio

With regard to Hypothesis 2, firms that put weight on price differences (favorable rates) are more likely to exchange at money changers (B) than at banks (A). Precisely, the estimation results suggest that those firms are 18.1% more likely to choose (B) compared with those that do not value this criterion, and 5.5% less likely to choose (A). As illustrated in section 5.2.2, this could be due to an obsolete perception given that the observed difference between the best exchange rates of money changers and those of some banks was no more than 0.2% of the value of one US dollar. Thus, it is important to communicate with firms and the public about the different rates offered by banks and money changers for their informed decision. Apart from our two main hypotheses, the estimation results indicate some distinctive patterns regarding firms' choices of currency exchange methods:

1. More firms perceive money changers as being located closer to them and being more convenient than banks. Firms that put weight on close distance and convenience are 12.3% and 12.0% respectively more likely to select money changers (B), while they are 3.2% and 3.4% respectively less likely to select banks (A).
2. Second, firms have different perceptions of money changers in rural and urban areas. Table 5.7 in Appendix 5.1 shows that in rural areas, firms that value the distance, favorable rates, and convenience are more likely to exchange currency at money changers (B) by 4.1%, 16.8%, and 11.4%

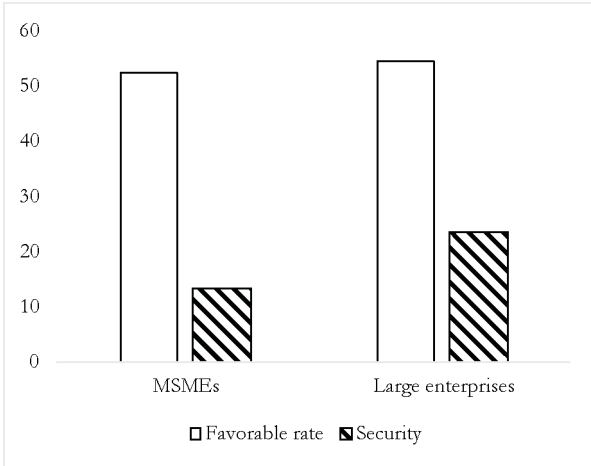

Figure 5.7 Percent of firms that perceive favorable rates and security criteria as one of the main reasons to select a currency exchange method by firm size

respectively. By contrast, in urban areas, these effects increase to 16.0%, 18.4%, and 13.2%. Likewise, the effect of the security criterion is negative and equals 25.4% in rural areas, while it is also negative but is reduced to 16.0% in urban areas.

3. Large firms exchange their currency at both banks and money changers (C). The fact that large firms prefer (C) could be due to their preferences for both security (in favor of banks) and favorable rates (in favor of money changers). For example, Figure 5.7 shows that when 54.6% of large firms against 52.6% of MSMEs perceive that favorable rate is a main reason to decide on a currency exchange method, 23.8% of large firms also consider the security as a main reason against only 13.5% of MSMEs. It is likely that the volume of exchange by large firms is higher, making them value more secured transactions than MSMEs.

5.5.2 Discussion

Regarding the interlinkage between cash payments and currency exchange, we profile the firms which are dependent on cash payments, with respect to three aspects: accounting practice, firm size, and tax compliance. First, Figure 5.8 summarizes the relationship between accounting practices and cash expenditure. The figure shows that firms with formal accounting use less cash than firms with informal accounting or no bookkeeping. Among the sample firms of our survey, only 110 firms (13%) keep formal accounting records, while 661 firms (79%) informally record their transactions, and 69 firms (8%) answer "no bookkeeping."

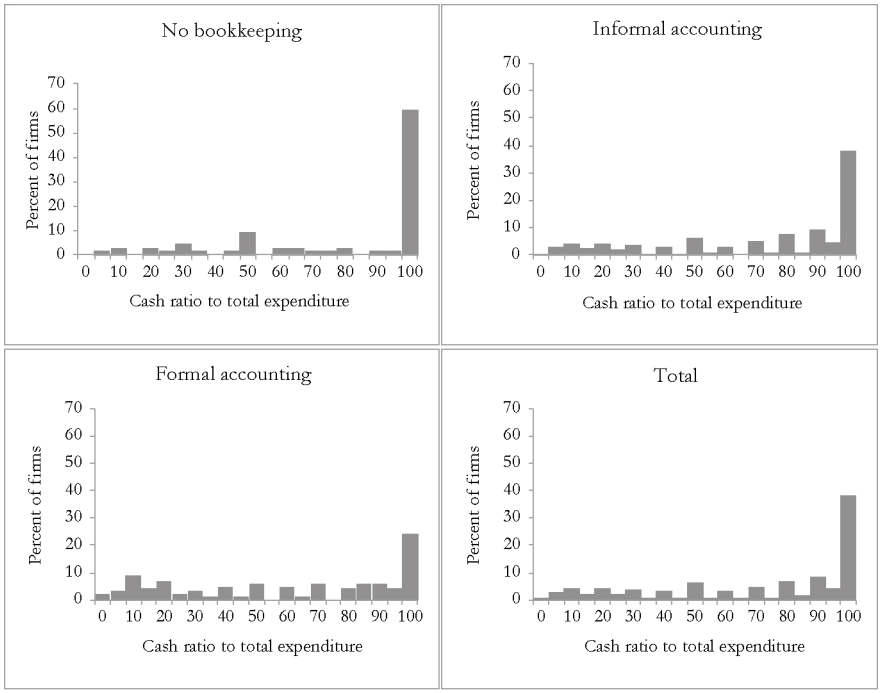

Figure 5.8 Cash expenditure ratio by accounting record

Second, the adoption of formal accounting varies to some extent by firm size. Figure 5.9 contrasts differences in accounting practices between large firms and MSMEs. The figure shows that even among large firms, adoption of formal accounting remains low (about one-third of firms), and it is very low among MSMEs (less than 10%). These results imply low managerial skills in Cambodian firms.

Third, while not explored explicitly in our survey, tax compliance is possibly correlated with both cash payments and accounting practices. For large firms, tax evasion can be an underlying motive to adopt informal accounting and cash payments. As most MSMEs are not covered by the tax net, they do not have incentives to keep proper accounting records. Weak tax compliance and the narrow tax net are considered root causes of poor accounting practices, which are highly compatible with cash payments.

Cash or non-cash payments also influence the competitiveness of banks versus money changers in currency exchange service. Firms are shown to choose money changers on the basis of close distance and convenience in addition to perceived favorable rates. One reason for the perceived convenience of money changers is that they accept dirty and torn banknotes. However,

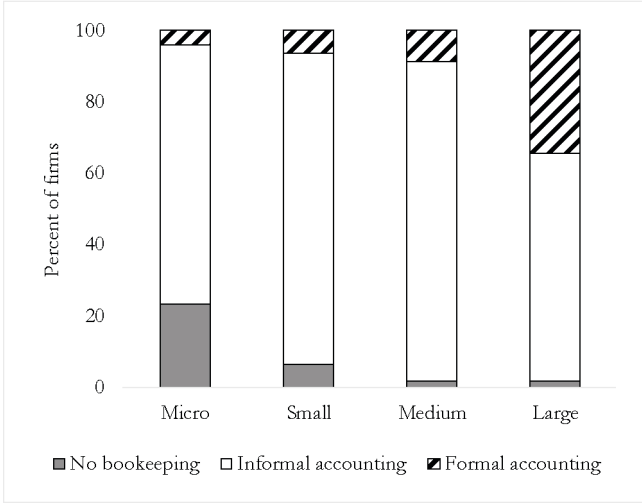

Figure 5.9 Accounting record by firm size

non-cash payments would eliminate this advantage of money changers. Furthermore, digital payments and internet banking would reduce the weight of distance in firms' decision in favor of banks over money changers.

Apart from non-cash payments, the unravelling of dollarization *per se* would add to the competitiveness of banks in terms of favorable exchange rates in currency exchange. Currently, the balance sheets of banks are skewed to US dollars, which raises their costs of handling currency exchange service. Once their balance sheets stretch into KHR, economies of scope emerge between currency exchange and other financial services, which allows banks to offer competitive rates for exchange.

Overall, the development of non-cash payments is expected to reinforce the competitiveness of banks over money changers in currency exchange service. The promotion of non-cash payments consists of both the supply-side and demand-side policies. On the supply side, there has been remarkable progress in non-cash payment infrastructure as documented in section 5.2.4. On the demand side, policy interventions are necessary to nurture the managerial skills and financial literacy of firms as well as to cultivate their tax compliance so firms have incentives to reap benefits from non-cash payments.

5.6 Conclusion

As Cambodia has embarked on the unravelling of dollarization from the highly dollarized state, how to contain transitional costs of de-dollarization becomes an important policy issue. One such cost is the currency mismatch

risk at financial institutions that emerges when banks depart from an entirely dollarized balance sheet to expand asset and liability management partially in KHR. Another cost is currency exchange—an economy-wide efficiency loss. As more mixed uses of multiple currencies are likely to increase burdensome currency exchange transactions, this chapter explores how to manage the transitional cost of de-dollarization. Our presumption is that banks' takeover of currency exchange services from money changers would help them to expand the outreach and depth of banking services, which signifies the conversion of currency exchange to a catalyst for financial development.

With the original dataset on currency exchange transactions of firms, empirical results support our two main hypotheses. First, currency exchange choices and payment methods are interlinked: firms with a higher ratio of cash expenditure to total expenditure are more likely to exchange at money changers. The finding is consistent with the view that firms utilizing non-cash payments make use of banks for currency exchange as banks offer multiple services in one stop, and do so efficiently. Second, firms' perceptions of price differences influence their preference for money changers to banks, yet our dataset does not allow us to validate whether firms have had informed decisions about the currency exchange rates or they have a biased perception based on the long track records of money changers as traditionally competitive service providers. Besides these two main results, exchange transactions with money changers are perceived to be superior to those with banks in terms of convenience and distance, yet are also seen to be less secured. Those perceptions, conditional on their relative importance that could be influenced by firms' characteristics (size, locations, and sectors), drive firms' preference for a currency exchange method over other options.

In terms of policy implications, given that firms' decisions on currency exchange and payment methods are interlinked, promoting the use of banks in these two services must be addressed together rather than separately. More uses of banks for settlement stimulate currency exchange at banks and vice versa. However, as long as firms' preference for cash payments stems from their poor managerial skills and weak tax compliance, there is no silver bullet to eliminate persistent cash transactions. For authorities, steady efforts in financial literacy and tax education can be a key step towards the development of non-cash payments and currency exchange at banks, which in turn adds to the containment of the transitional costs of de-dollarization.

Notes

1 Currency that is used as a unit of account, medium of exchange, and store of value.
2 Technically, if a foreign currency completely replaces the home currency, it eliminates the need for currency exchange. Such a situation is referred to as official dollarization or full dollarization (Berg and Borensztein 2000), with examples including Ecuador, El Salvador, and Panama. By contrast, the situations of Cambodia and many other countries are referred to as unofficial dollarization or partial dollarization.

3 Nonetheless, for border trade with neighboring Thailand, where trade settlements are often in Thai Baht cash, money changers offer currency exchange services for traders.
4 Observations were made on September 12, 2018. Twenty observations include nine banks and eleven money changers.
5 By buying US$1,000 from a customer and selling the same amount to another customer with these rates, the profit of this money changer obtains is merely US$1.50.
6 In fact, some foreign-owned banks did not offer currency exchange services at all.
7 This particular characteristic is a legacy from the period when the banking sector was underdeveloped, and money changers played an overwhelming role in smoothing currency exchange and thus business transactions in a dual-currency system. After the banking sector reforms of the early 2000s, the sector expanded, yet the size of money changers' operations was too big and their influence on people's lives and business operations was too significant to exclude them from direct dealings with NBC, especially in the context of a large informal economy with the use of cash as a dominant means of payments.
8 Chapter 6 presents more discussion about the digital payment infrastructure.
9 We only mention a few of the recent payment systems developed by the NBC. For further information, read the payment system annual report on the NBC's website.
10 The data do not allow us to separate whether payments are made by individuals or firms, but it sounds as if customers using NCS are more likely to be at firm level in contrast to Fast, Bakong, and other systems that are more retail payments in nature.
11 El Qorchi et al. (2003) examined money changers in Afghanistan, but with a particular focus on cross-border money transfer services, seeing the issue of money laundering in the aftermath of the 9/11 terrorist attacks.
12 Related to the costs of payment instruments is the cash balance at the start of the survey period. Those survey respondents who had larger cash balance at the start were found to choose cash payment more since the marginal cost of paying cash in hand was zero (Arango et al. 2014; Arango et al. 2018).
13 The first-round survey comprised the data collection on corporations and the concomitant data collection on households in 2014. Using the dataset of the first-round survey, Okuda and Aiba (2018) analyzed capital structure decisions of firms under dollarization, and Aiba et al. (2018) examined the borrowing behavior of households.
14 Aiba and Tha (2017) calculate the currency mismatch as follows:

$$Surplus\ of\ FX\ currency_i,(\%) = \frac{Sales\ in\ FX_i - Expenditures\ in\ FX_i}{Total\ Sales_i} * 100$$

15 Other sectors include information and communication, electricity and gas supply, construction, real estate, education, and health.
16 Based on the Ministry of Industry, Science, Technology and Innovation's SMEs' Department Director, cited in *Khmer Times*: www.khmertimeskh.com/50777691/micro-small-medium-firms-vital-but-need-support-report/
17 We do not report results of firms in the category (D) in Table 5.6 because most do not conduct exchange transactions with a third party, thus this question is irrelevant to them.

18 Other variables in the model take their mean values.
19 There are 856 firms in the survey, but due to missing values regarding firms' sale and expenditure, the number of firms is reduced to 691.

Acknowledgment

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Appendix 5.1: Results of the Bivariate Probit Model

Table 5.7 presents the estimation results of the bivariate probit model that allows us to see the direction of impact (positive or negative) of independent variables on the outcome variables. For example, increasing cash expenditure ratio decreases the likelihood that firms will exchange currencies at banks, and increases the likelihood of exchange at money changers.

Nevertheless, we cannot interpret the size of impacts based on those coefficients. In addition, Table 5.7 does not allow us to observe all the possible outcomes we mentioned in Box 5.1. It is necessary to estimate the marginal effect of each independent variable that tells us how the outcome variable changes when an independent variable changes. For example, a 1% increase in cash expenditure ratio reduces the probability that firms will change at banks by 0.001 (or 0.1%) and increases the probability that firms will change at money changers by 0.002 (or 0.2%). These results are reported in Table 5.8.

Table 5.7 Regression results from the bivariate probit model[a]

Outcome variables	*Exchange at banks*		*Exchange at money changers*		*Rho (ρ)*	
Independent variables	*Coef.*	*Robust std. err.*	*Coef.*	*Robust std. err.*	*Coef.*	*Robust std. err.*
Cash expenditure ratio	-0.012***	0.002	0.003**	0.001		
Industry dummy (Base: Other sectors)						
Agriculture	0.233	0.466	0.005	0.365		
Manufacturing	-0.295	0.345	0.366**	0.180		
Wholesale and retail trade	-0.607**	0.279	0.355**	0.162		
Tourism	-0.202	0.304	0.163	0.157		
MSMEs	-0.305**	0.128	-0.068	0.171		
Rural	0.408**	0.161	-0.228**	0.104		
Phnom Penh	-0.331***	0.120	-0.432***	0.088		
Having a deposit account	0.065	0.122	0.112	0.132		
Having a loan account	-0.002	0.147	0.441***	0.136		
Criteria for selecting currency exchange methods:						
Close distance	0.197	0.137	0.880***	0.107		
Favorable rates	-0.027	0.106	1.040***	0.116		
Convenience	0.079	0.153	0.766***	0.171		
Security	1.074***	0.156	-0.210***	0.208		
Constant	-0.016	0.403	-0.991***	0.278	-0.484***	0.090
Observations	799					
Log pseudolikelihood	-580.117					

Note: The bivariate probit model is estimated with cluster robust standard errors at provincial level.
*** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculation.

[a] The number of firms in the regression equals 799 observations due to missing information on some independent variables.

Table 5.8 Estimated impacts of independent variables on firms' decision to select a currency exchange method

Outcome variable	*Exchange at banks only (A)*		*Exchange at money changers only (B)*		*Exchange at banks and money changers (C)*		*No exchange at banks or money changers (D)*	
Independent variables	*Marginal effect*	*Std. err.*	*Marginal effect*	*Std. err.*	*Marginal effect*	*Std. err.*	*Marginal effect*	*Std. err.*
Cash expenditure ratio	-0.001***	0.000	0.002***	0.000	-0.002***	0.000	0.000	0.000
Industry dummy (Base: Other sectors):								
Agriculture	0.024	0.065	-0.041	0.109	0.043	0.087	-0.025	0.067
Manufacturing	-0.049	0.032	0.109*	0.064	-0.024	0.059	-0.036	0.043
Wholesale and retail trade	-0.067***	0.025	0.150***	0.043	-0.067	0.051	-0.015	0.043
Tourism	-0.030	0.025	0.060	0.045	-0.021	0.057	-0.009	0.047
MSMEs	-0.017	0.013	0.031	0.037	-0.046**	0.019	0.033	0.030
Rural	0.040***	0.014	-0.096***	0.032	0.045**	0.022	0.011	0.021
Phnom Penh	-0.001	0.010	-0.027	0.026	-0.069***	0.020	0.097***	0.013
Having a deposit account	-0.001	0.013	0.010	0.034	0.015	0.015	-0.024	0.020
Having a loan account	-0.023**	0.012	0.076**	0.030	0.022	0.022	-0.075***	0.026
Criteria:								
Close distance	-0.032**	0.012	0.123***	0.028	0.073***	0.021	-0.164***	0.018
Favorable rates	-0.055***	0.013	0.181***	0.028	0.050***	0.013	-0.176***	0.016
Convenience	-0.034**	0.016	0.120***	0.042	0.050**	0.021	-0.136***	0.024
Security	0.085***	0.022	-0.186***	0.053	0.140***	0.023	-0.038	0.028
Observations	799		799		799		799	

Note: *** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculation.

It is worth noting that the value of Rho (ρ) is negative (–0.484) and statistically significant at a 1% level (***), meaning that banks and money changers are substitutable in firms' decisions, as expected. However, the level of substitution is moderate as the absolute value of ρ is about 0.5 given that many firms do not exchange exclusively at banks or money changers. As we have illustrated, firms perceive transactions with banks as better secured, yet transactions with money changers offer more favorable rates, making several firms exchange at both banks and money changers, depending on the size of transactions and perhaps also on how they received the payments (in cash or non-cash).

Appendix 5.2: Effects of Firms' Perceptions on the Probability of Selecting Money Changers

Table 5.9 presents the effects of the firms' perceptions/criteria on the probability of selecting money changers in urban and rural areas. Note that we use the same empirical model and variables as in Tables 5.7 and 5.8, but we split the sample into urban and rural before running the regression. As we focus here on the effects of firms' perceptions in selecting money changers by area, the effects of other variables are not reported.

Table 5.9 Effects of firms' perceptions on the probability of selecting money changers (B) by areas

	Rural	*Urban*
Close distance	0.041	0.16***
Favorable rates	0.168***	0.184***
Convenience	0.114**	0.132**
Security	-0.254***	-0.16**

Note: *** p<0.01, ** p<0.05, * p<0.1

Source: Authors' calculation.

6 Electronic Payment and Promotion of Local Currency

Serey Chea and Sarat Ouk

6.1 Overview of Cambodia's Payment Landscape

6.1.1 Evolution of Payments in Cambodia

Cambodia has grappled with high levels of dollarization for the past two decades. The adoption of dollars in Cambodia was rather spontaneous, prompted by a combination of high inflation and steep depreciation of the local currency in the early 1990s, a lack of confidence in the government transition process and a massive inflow of US dollars through the United Nations for Transitional Administration of Cambodia (UNTAC). UNTAC spending in Cambodia has been estimated at around US$1.7 billion (Im and Dabadie 2007), the highest of any UN spending on a given mission. Since Cambodia's first general election in 1993, after nearly 20 years of civil war, dollars have become the de facto national currency, circulating simultaneously with the official currency, the Riel. The use of US dollars has become a fact of daily life. In fact, the Cambodia Development Council, an authority in charge of promoting investment opportunities in Cambodia by introducing different incentive schemes such as tax holidays and special economic zones, used and continues to promote the use of dollarization in Cambodia to attract foreign investors who may lack trust in the local currency.

Indeed, dollarization has been a great advantage for Cambodia's economy during its reconstruction period, contributing to increased confidence of investors as well as price stability. It is also important to stress that the liberalization of capital flows in Cambodia also played a major role in reinforcing this trust. Since then, many businesses view dollars as their preferred means of payment. For some policy-makers, dollarization should remain in Cambodia for its convenience, stability, and trustworthiness. The benefits and cost of dollarization in the economy are extensively debated in other chapters, so we will not discuss them in detail here.

Understanding the Cambodian attitude toward money and the monetary system goes back to ancient times. Nevertheless, in the 2000 years of Cambodia's history, a monetary system has been virtually absent. No trace of a monetary system has been found to exist during the peak of the Khmer

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civilization, the Angkor era, which lasted from the tenth to the twelfth century CE. Numerous excavations around Angkor's compound discovered little evidence of a monetary system and carvings on stone slabs also suggested that tax payments and royal donations, as well as other economic transactions, occurred through a barter system rather than coinage. Traces of foreign money were discovered, indicating the empire's trade with other parts of the world and the use of money to achieve this. However, attempts to introduce a general monetary system in the Khmer Empire were unsuccessful until the French protectorate era (nineteenth century), when a monetary union was created under the oversight of la Banque d' Indochina. The Piastre pegged to the French Franc was introduced for Cambodia, Laos, and Vietnam. Even then, Cambodia did not have its own independent monetary system, but rather a monetary system controlled from Paris. The concept of a national currency was not fully considered until 1954 when, under the leadership of King Sihanouk, a national currency was introduced, the Khmer Riel (KHR). For a short period since the Angkor era, Cambodia had its own currency and independent monetary system. But pride in this development was short-lived. When the civil war started in the early 1970s, the Khmer Riel was subject to double-digit depreciation, making it worthless.

On April 17, 1975, when the population of the urban centers was evacuated to work in rice fields across the country, their private ownership was gone within a day. The whole monetary system was abolished, with savings in bank accounts and banknotes becoming worthless overnight. For more than three years, the whole economy was reduced to a barter system. After the fall of the Pot Pol government, the new government re-established the national currency on March 20, 1980. But the trauma, lack of confidence, and habits meant a barter system would continue simultaneously with any currency system and it only slowly vanished in the early 1990s when a more stable currency entered the economy. Still, many Cambodians prefer commodity money over cash: gold was used for big transactions during the 1990s before swiftly being replaced by the US dollar. Trust in the banking system was also lacking, with people preferring to save in the form of land and properties or cash. The trauma of the 1970s and the Asian financial crisis of 1997 further reinforced this preference. But with a massive bank restructuring exercise in 2000 and the recapitalization of solvent banks, bank deposits slowly grew over the years, indicating the return of confidence (Figure 6.1).

The Cambodian people have experienced very traumatizing events in their lives. Many lost family members during the civil war. Most lost family during the Pol Pot regime between 1975 and 1979 to hunger, being overworked and mass extermination. This collective trauma partly dictates the wary attitude of the Cambodian people toward the domestic currency system despite two decades of stability of exchange rates, inflation, and positive economic prospects, the three main foundations of a trustworthy currency. Dollarization therefore remains dominant. Fast forward to the 2020s and Cambodia is known to have a vibrant digital payment system (Figure 6.2) and one of the

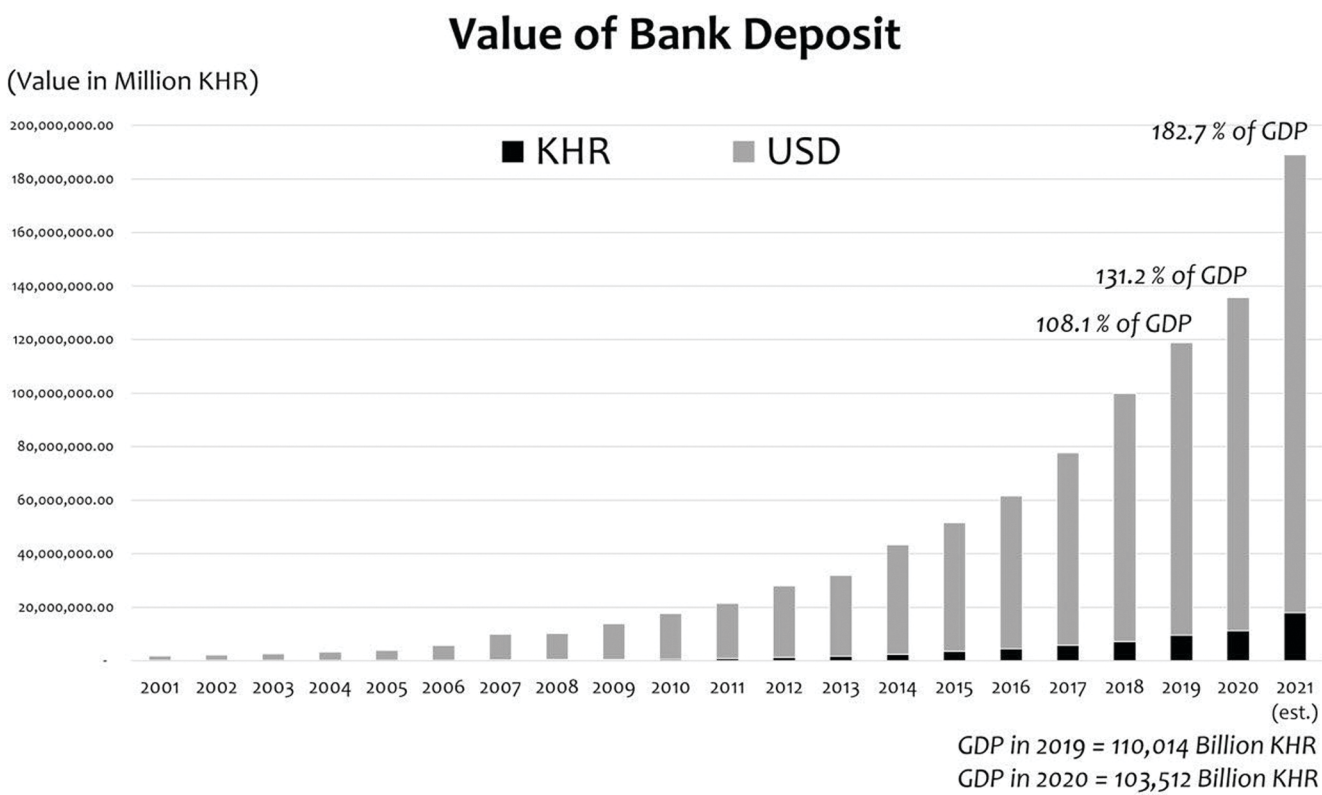

Figure 6.1 Value of bank deposits

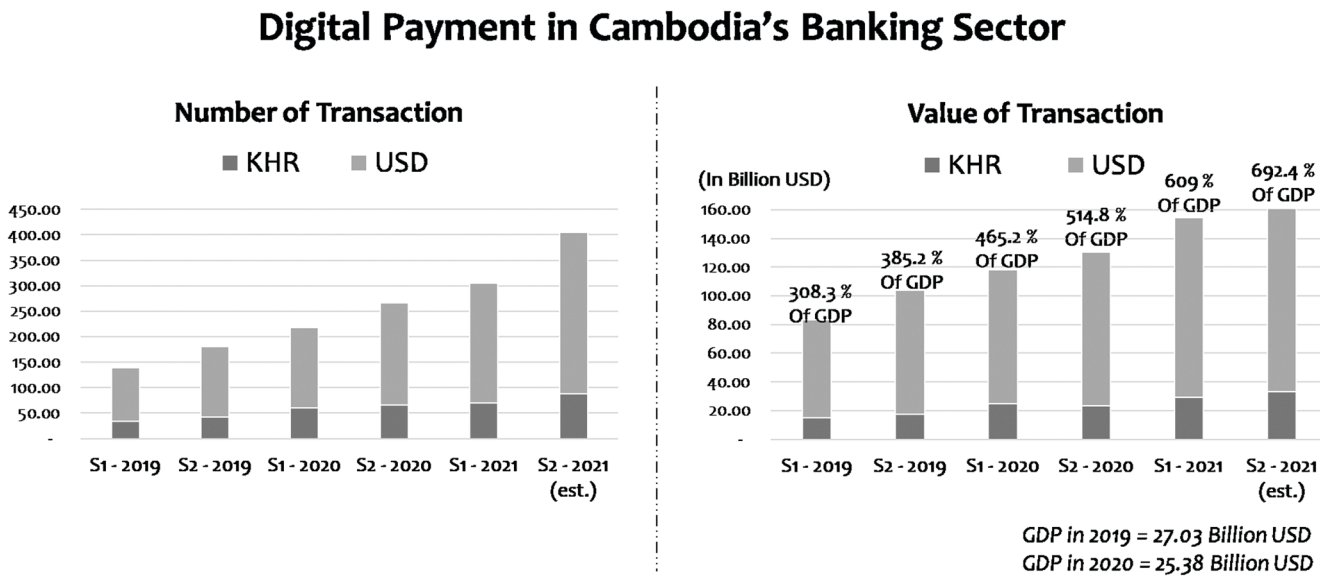

Figure 6.2 Digital payments in Cambodia's banking sector

Source: National Bank of Cambodia.

most sophisticated forms of money: digital money on Blockchain technology. Although cash remains a preferred means of payment due to historical and cultural factors where people prefer to hold onto something tangible, the adoption of digital payments has picked up rapidly over the years (Adrian and Mancini Griffoli 2019).

6.1.2 Development of Legal and Regulatory Frameworks for Payment

Legal and regulatory frameworks play a very important role in ensuring safety, efficiency, competition, transparency, and innovation while maintaining financial stability in payment systems. A series of laws such as the Law on the Organization and Conduct of the National Bank of Cambodia, the Law on Banking and Financial Institutions, and the Law on Negotiable Instrument and Payment Transactions are the crucial legal foundations that provide the NBC with the power to exercise its mandates. Various regulations have been issued in relation to payment system infrastructures, payment services, payment instruments, and the promotion of innovation in the Cambodian market via the test and learn approach.

When mobile money service providers were first authorized by the National Bank of Cambodia in 2009, the mandate was to only allow transactions in the local currency. Mobile money service providers at that time were only able to process domestic remittances. In its efforts to promote local currency, encouraging payments in the local currency was key. It was therefore important that at least small transaction values should be carried out in KHR, therefore limiting domestic electronic remittances in KHR was intended to give local currency usage an upper hand over US dollars. Previously, domestic remittances were done in a very informal manner where banknotes are sent through an intermediary, who would physically travel to give the money to the beneficiaries; they would charge high fees and the transaction would be exposed to a high risk of default (i.e. the intermediary could run away with the money). This model was the first of its kind and it was understood that a stocktaking assessment of its effectiveness should be carried out a few months later. Unfortunately, when the time came, the model was not financially feasible for the payment service providers (PSPs). Indeed, most remittances in the country are from urban to rural areas—mostly migrant workers remitting money back to their families. As salaries are paid in US dollars, workers need to exchange their US dollar receipts into KHR before being able to send them. Coupled with a lack of understanding of electronic fund transfers, the old way was preferred.

The objective of the NBC in promoting the use of local currency and promoting financial inclusion required a compromise. The NBC therefore decided to allow PSPs to use both currencies to create convenience and ultimately promote the adoption of new, innovative, and safe ways of transferring money. As many other PSPs came into the system, US dollar transactions became the default currency and e-wallet accounts could be opened.

Nevertheless, e-payment did not grow until 2016, when more players came into the industry and competition started. But most service providers of this type pay little attention to the use of local currency. Few service providers offer e-wallet accounts in local currency to their customers, with exception of the Japanese Aeon specialized bank which introduced a e-wallet exclusively in the local currency. Yet adoption remained slow. In this instance, electronic money did not just make the use of KHR easier, but also had the same effect for US dollars.

6.1.3 Behavioral Change Toward Digital Payments

Cambodia is still generally known as a cash-based economy. However, digital adoption has been accelerating thanks largely to growing digital literacy, especially among the younger generations. Some studies indicate behavioral changes toward digital payment. According to a study on consumer payment attitudes conducted by Visa in 2018, around one third of Cambodians expect digital payment to become more popular due to its convenience and security compared to cash. Mobile payment, contactless payment, and QR code payment are among the mean of interest indicated in that study. An empirical analysis of Cambodia behavior toward mobile payment conducted by Do et al. (2019) also found that Cambodians will increase the use of mobile payment because of its speed, which allows consumers to save time in conducting transactions. In addition, a study by Deth et al. (2020) foresees that Cambodia could become a cashless society by 2040, given several existing conditions consisting of a high mobile phone penetration rate, increases in the ownership of smartphones, the accelerating access to the internet at a competitive price, the development of communications technology, technology leapfrogging, and the availability of digital infrastructure to support cashless payments. Despite this good indication of intent towards digital payments, the attitude toward digital adoption in local currency remains somewhat negative and relatively low compared with digital adoption in foreign currency. In addition, the policy approach for behavioral change toward KHR digital payments would help the overall strategy on the promotion of the use of local currency.

6.2 Dollarization in Digital Payments in Cambodia

Cambodia is still considered a highly dollarized economy despite the continuous efforts of the government to promote the use of local currency. By mid-2021, the ratio of foreign currency deposits to broad money and the ratio of foreign currency deposits to total deposits had been reduced but remained well above 80% and 90% respectively. Similarly, the share of foreign currency loans to total credit has been reduced since the introduction of compulsory lending in the local currency but still accounted for more than 85% as of June 2021. These demand-side and supply-side factors are generally used to determine the degree of dollarization in Cambodia. However, transactional data,

in particular payment data, have received little attention to explain the scale of foreign currency transactions as compared with local ones, largely because of the lack of data availability. Given the growing popularity of digital transactions recently due to the COVID-19 pandemic and behavioral change of the public, especially among the younger generations, an examination of dollarization in digital payments is also crucial to design future policy responses.

6.2.1 Payment System Infrastructure

Payment systems play an important role in supporting economic growth via the introduction of efficient infrastructure to facilitate economic transactions within the country. In the payment system, the National Bank of Cambodia (NBC) is empowered to perform the functions of overseer, operator, and facilitator. In terms of overseeing the payment system, the NBC aims at ensuring security and effectiveness by establishing regulatory frameworks, assessing risks and stability, and maintaining truth in the system. As the operator, the NBC manages and runs major infrastructure that has systemic importance and includes both large value payment systems and retail payment systems. On its role as facilitator, the NBC ensures that payment systems are modernized, innovative, and inclusive. With these mandates, the NBC has achieved significant milestones in the development of various payment system infrastructures such as the National Clearing System (NCS), the Online Banking System (OBS), the Fast Payment System (FAST), Cambodian Shared Switch (CSS), and the Bakong Payment System. The degree of adoption of both local and foreign currency within each system varies according to the nature of the policy embedded in the system.

The National Clearing System (NCS) was officially launched in 2012 and fully integrated in 2014 to facilitate interbank clearing and settlements. There are two main instruments under this system, check and electronic payment order processing. The system is designed for batch processing and two settlement times a day are designated. Currently, there are 54, including 36 direct members and 18 indirect members. The system is capable of processing both local and foreign currencies, in particular the US dollar. The average number of transactions for each semester within the past few years has been stable for both KHR and US dollars; however in terms of value, US dollar processing is still dominant (Figure 6.3).

The Online Banking System (OBS) was officially launched in January 2016 to support interbank electronic fund transfer in real time and on a gross basis. It was also introduced as part of the NBC's effort to ease administrative procedure for account management and to reduce the usage of paper-based instruments. Currently, the system has a total of 68 member institutions, including 46 commercial banks, three specialized banks, three deposit-taking microfinance institutions and six microfinance institutions, 12 payment service providers and the Treasury Department of the Ministry of Economy and Finance. The system process more in local currency in terms of number of

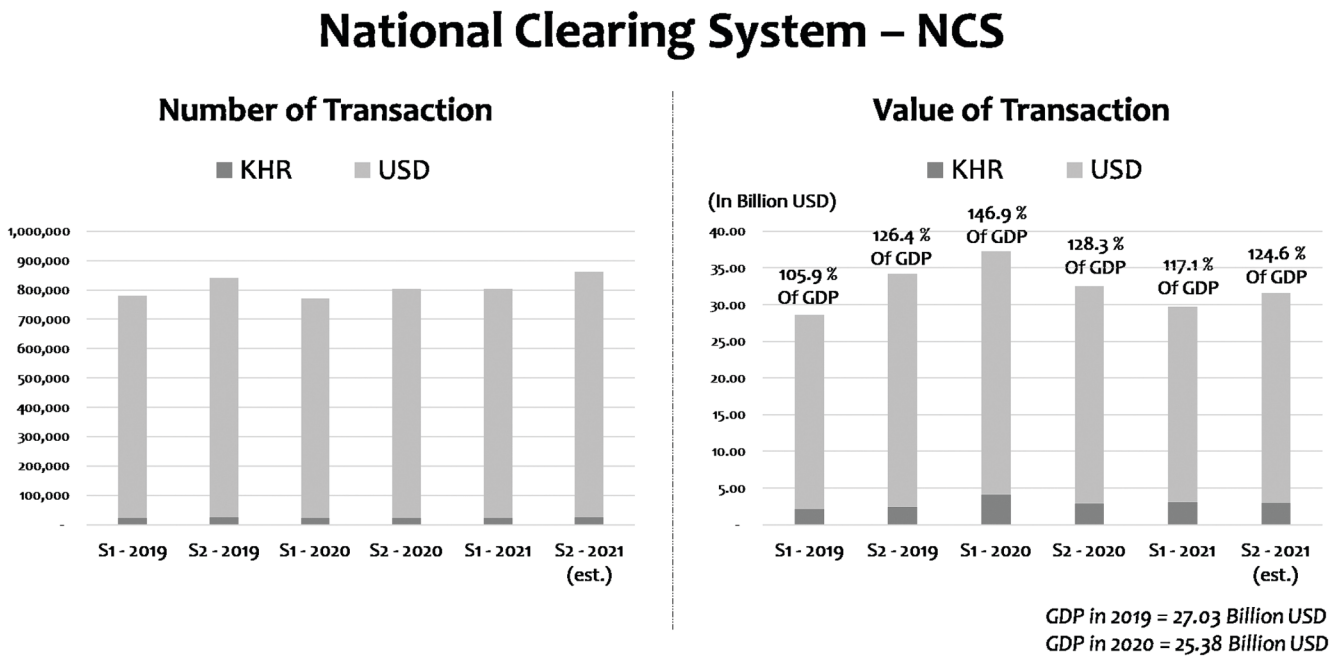

Figure 6.3 National Clearing System (NCS)

Source: National Bank of Cambodia.

transactions but less in terms of market value. It processed around 122% of the GDP during the last six months of 2021 (Figure 6.4).

The Fast Payment System (FAST) was introduced in 2016 as part of the NBC's efforts to promote the use of local currency given that the system only operates in Khmer Riel. FAST is a real-time processing payment order where the beneficiary should be able to receive funds almost instantly, but each transaction is capped at KHR 40 million (approximately US$10,000) per transaction per day. Despite real-time processing, FAST still requires arrangement for clearing and settlement as well as a front-to-end processing service offered by the participants to achieve instant payment. There are 55 institutions participating in the system, including most of the commercial banks and microfinance deposit-taking institutions. As the front-to-end services offered by the participants are limited and due to the lack of public promotion, FAST is mostly considered inconvenient. Transactions processed via the FAST system remain less than 1% of GDP. In order to promote FAST as an attractive means of payment, some key policy measures have been reviewed with regard to membership eligibility, transaction limits, transaction channels, and the currency option (Figure 6.5).

The Cambodian Shared Switch (CSS) was developed to specifically address the issue of interoperability for domestic payment card ecosystem. The system was introduced in 2017 to provide card payment connectivity across different platforms and promote cost-efficiency for participants as well as expand access to all ATM and POS networks within the country. Currently, the system has 53 members at a different stage of integration, given some challenges regarding the adoption of standard chip specification, transaction cost for ATM and POS rollout, co-badge with international card scheme, and transaction fee for the end-user customers. Overall transactions of the system are rising over time, but remain less than 1% of GDP. Interestingly, the system processes local currency transactions more than foreign currency transactions. This can be explained by the participation of the microfinance sector in the system, where agriculture-related transactions are largely conducted in local currency (Figure 6.6).

6.2.2 Payment Services

As well as payment system infrastructure development, the NBC also focuses its effort on improving payment services for the benefit of financial inclusion, innovation, and stability. Payment services in Cambodia have been flourishing as a result of continuous regulatory reform and participation from banking institutions and emerging payment players such as payment service institutions. Institutions are now competing on a level playing field to expand access, usage, and quality of the financial services. Core payment services provided by these institutions include the issuing of e-money, fund transfers, agent banking, retail payment, e-commerce, and cross-border remittances.

Banking institutions such as commercial banks, specialized banks, and microfinance deposit institutions play an active role in electronic payments in

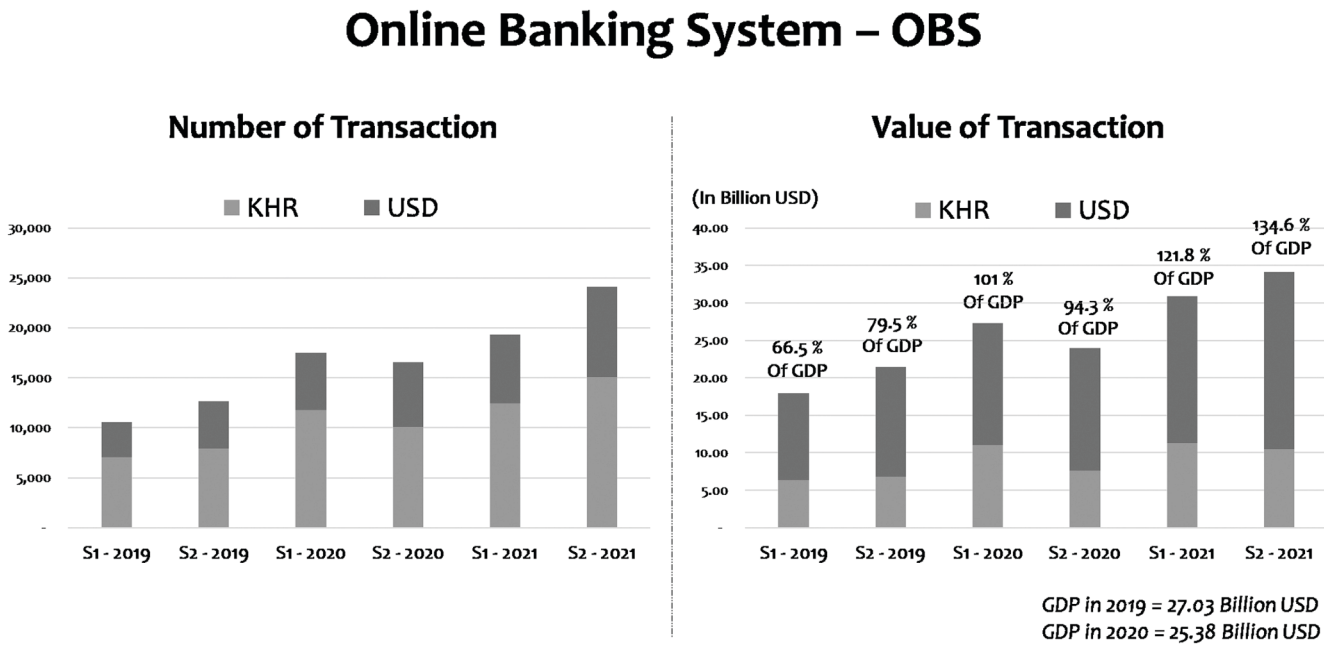

Figure 6.4 Online Banking System (OBS)

Source: National Bank of Cambodia.

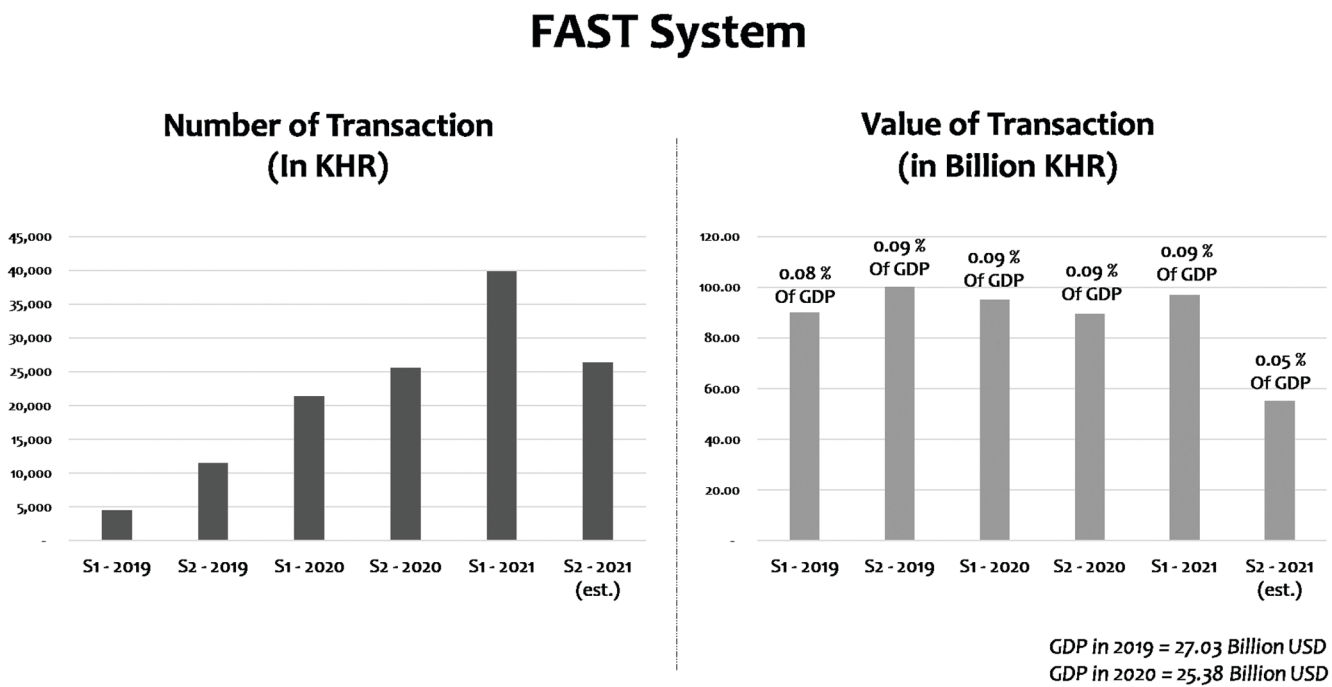

Figure 6.5 The Fast Payment System (FAST)

Source: National Bank of Cambodia.

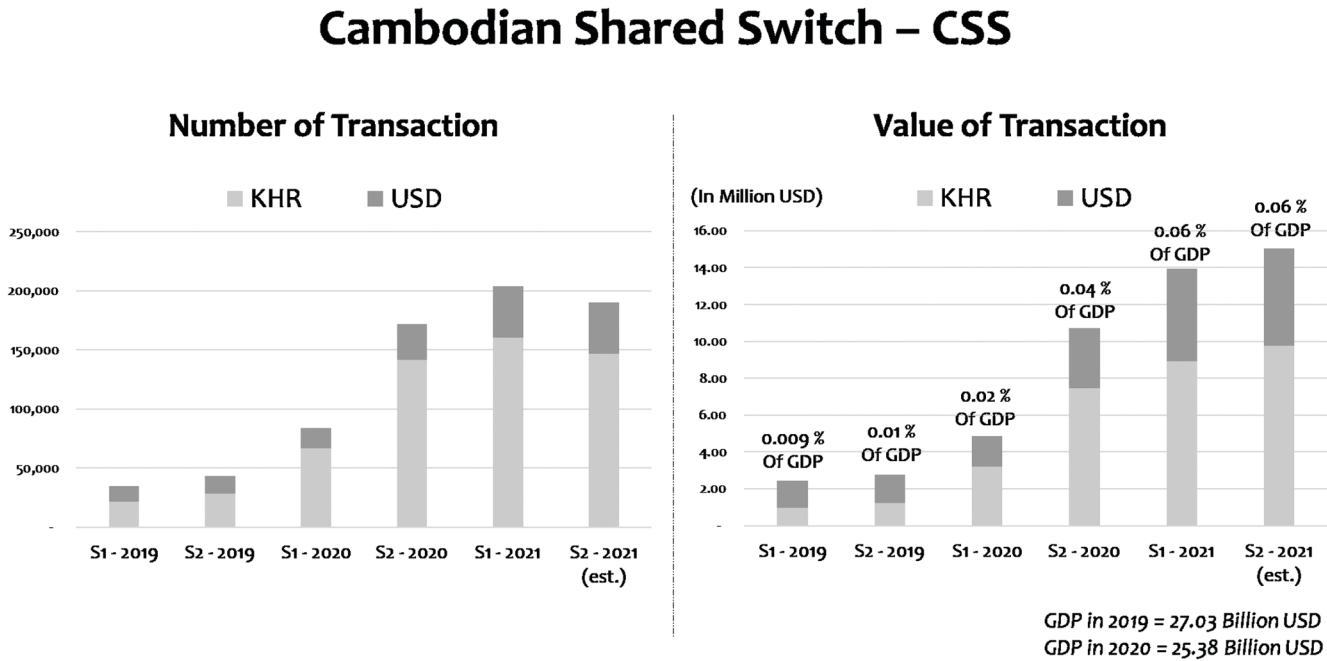

Figure 6.6 Cambodian Shared Switch—CSS

Source: National Bank of Cambodia.

Cambodia. They participate actively in the central infrastructure introduced by the central bank and offer digital chancel to the end users, including e-wallet, internet banking, mobile banking, card payment, and payment gateway. End users in both urban and rural areas would be able to access banking services; however, a few institutions offer payment instruments and channels in local currency. Electronic transactions processed by banking institutions are largely dominated by foreign currency and reached around 420% of GDP by 2021. Although payment transactions in local currency are a small proportion, the trend keeps increasing over time, which provides a good long-term outlook (Figure 6.7).

Payment service institutions are specialized institutions to provide innovative electronic payments and transfers to end users. With fewer prudential requirements compared with banking institutions and the ability to engage more in the agent banking space, they better serve the needs of rural populations than banking institutions. By the second semester of 2021, payment service institutions were processing digital transactions of around 15% of GDP and nearly half of this was conducted in local currency (Figure 6.8).

6.2.3 The Bakong Backbone Payment System Infrastructure

Cambodia's economy is still heavily dependent on the US dollar, and most transactions are still in cash. This could impede the implementation of monetary policy and the growth of payment systems. As the country's monetary and payment system authority, the NBC has launched the Bakong payment system, which is designed to promote the use of local currency and electronic payments in Cambodia, enabling interconnectivity and interoperability across multiple payment service providers (see also section 6.3.2). With the adoption of standardized QR code payments, the Bakong system provides a more convenient and more broadly accepted channel for its users to make electronic payments at any merchants. Due to its ability to link with bank accounts, customers can also transfer funds from Bakong accounts to their bank accounts and vice versa. Cambodia has a large but young population, so a modern payment system based on QR codes can easily be implemented as younger people would likely prefer electronic payments over traditional cash payments. The growth of Bakong is projected to stimulate the use of the local currency by enabling payment for high-value transactions and can be used as a strategy to promote local currency by giving the Riel advantages over US dollar transactions. In March 2021, a Circular on the Transaction Limit and E-KYC Guideline for Electronic Payment in Cambodia was issued as a minimum guidance for E-KYC on consumers who registered for bank or e-wallets as well as to increase transaction limits. The aims were to encourage the use of digital payments, making it easier to settle bulk transactions in the local currency and to help with the containment of COVID-19. As of 2021, the number of Bakong users had reached about 7.9 million people (Figure 6.9)

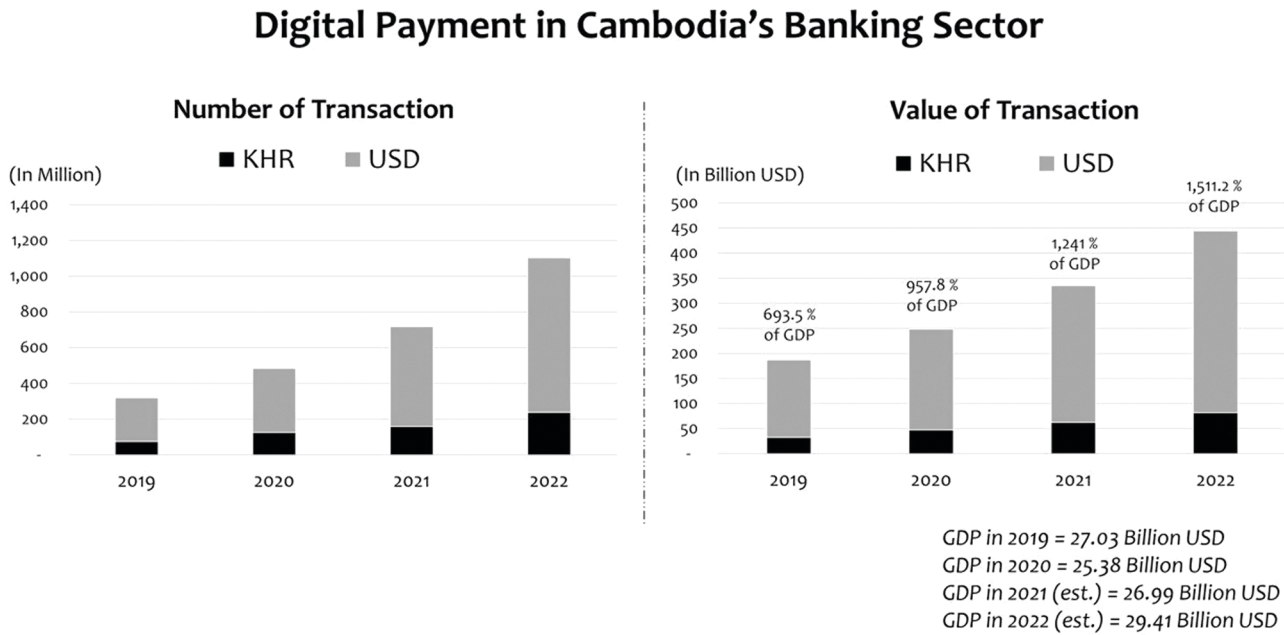

Figure 6.7 Digital payments—banks and FIs

Source: National Bank of Cambodia.

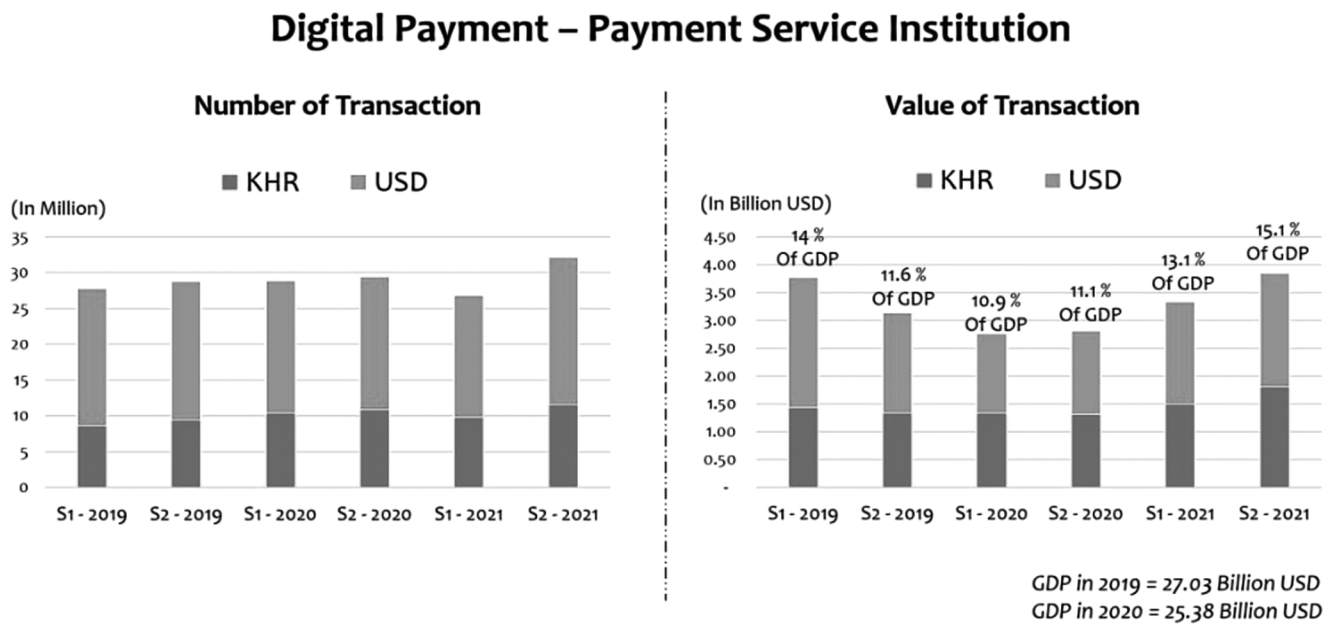

Figure 6.8 Digital payments—payment service institution

Source: National Bank of Cambodia.

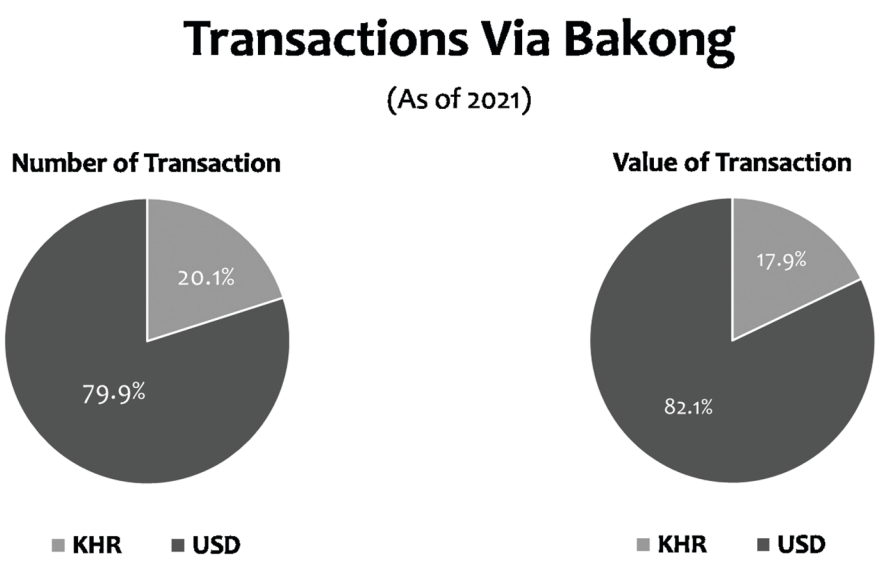

Figure 6.9 Transactions via Bakong

Source: National Bank of Cambodia.

with the total transaction amount of 1.64 million in KHR and 6.53 million in US dollars (equivalent to 13.87% of GDP).

Although the use of local currency has continued to improve, more policies are needed to make it more convenient and to further enhance public confidence. In early 2020, to promote the use of local currencies and financial inclusion, the NBC and the Bank of Thailand launched an interoperable QR payment link between Cambodia and Thailand, which encourages retail payment activities and boosts tourism in both countries. Consequently, Cambodians who intend to travel to Thailand can pay to retail merchants in Thailand for their goods or services in Khmer Riel by scanning of the QR code through mobile banking applications. Similarly, using the mobile banking application, Thai tourists will also be able to scan QR codes for goods and services in Thai Baht with various vendors in Cambodia.

To expand the initiative of cross-border cooperation with regional countries, the NBC and the Maybank Malaysia recently officially launched cross-border payments through the Bakong system with Maybank's Mobile Baking Application (MAE APP), enabling faster and more convenient real-time money transfer between the two countries. The collaboration is in response to the current development of the cross-border payment ecosystem and will address the challenges of Cambodian people working in Malaysia, who require a more convenient, affordable, and faster way to remit money back home.

In the first phase, customers will be able to transfer funds from Malaysia to Cambodia, while transfers from Cambodia to Malaysia will be rolled out in due course. There is a minimal service fee compared with the existing remittance networks. Maybank customers can transfer funds up to US$2,500 (or RM10,000 equivalent) daily via their mobile devices.

6.3 Digital Currency and Dollarization in Cambodia's Context

6.3.1 Digital Currency in Cambodia

The digitalization of the economy and the rapid development of technology have presented options and challenges for central banks, especially around payment systems. The presence of the COVID-19 pandemic has also further accelerated the trend of changing how people make payments. The demand for a more convenient, cheaper, faster, safer, and more efficient payment system has fueled the rapid adoption of electronic payments by the public, resulting in a decline in the use of paper-based instruments such as cash and checks, and many countries in the world have shifted from this traditional way of making payments to the use of digital currency.

Digital currency is an overarching term that can be used to describe different types of currencies that exist in the electronic realm. It is also called digital money, electronic money, or electronic currency, which refers to a form of currency that is available in digital or electronic form. Cryptocurrencies, virtual currencies, central bank digital currencies, and e-cash are types of digital currencies. Whereas virtual currency is an unregulated digital currency controlled by developers consisting of various stakeholders involved in the process, central bank digital currencies (CBDCs) are regulated digital currencies issued by the central bank of a country (Auer, Cornelli, and Frost 2020; Bank for International Settlements 2018; Boar and Wehrli 2020). All the digital currencies mentioned share similar characteristics in that they do not require a mediator and are beneficial for users as their transactions are cost-efficient and seamless. However, each type of digital currency is unique in many ways, as it possesses its own use cases depending on the specifications and requirements of the issuers, as well as its own flaws and positive aspects.

Electronic money was first introduced in Cambodia in 2009; however, it was not until 2016 that this form of money was widely adopted by the public. As is the case in other countries, electronic money issuers are regulated entities and are subject to a series of prudential regulations, including minimum capital requirements. Cambodia has adopted a very conservative approach to issuing electronic money where the amount of electronic money issued must be backed by 100% fiat currency held in a trust account at a commercial bank. This is also to ensure that the electronic money issued would not multiply the aggregate money supply, which could impact the monetary condition of the overall economy. Unlike other countries, electronic money issued in Cambodia can be denominated in foreign currency along with local currency, with the

conversion rate determined by the issuers. This digital form of money has fueled dollarization in Cambodia through increases in small-value payments but at the same time has promoted the adoption of local currency by making large-value transactions in the local currency easier.

In line with electronic money development, new innovative instruments in particular crypto assets such as Bitcoin have also emerged in Cambodia's financial markets. The regulatory authorities have not recognized Bitcoin or any other form of cryptocurrency as a means of payment since such cryptocurrency could pose serious risks to the public. In response to this, on May 11, 2018, the National Bank of Cambodia (NBC), the Securities and Exchange Commission of Cambodia (SECC), and the General Commissariat of National Police in Cambodia released a joint statement aimed at warning individuals on the risk of such activities, while restricting financial institutions when dealing directly or indirectly with any crypto-assets. Currently, the regulatory framework for crypto-assets is not clearly defined, with the relevant authorities still studying appropriate regulatory approaches.

6.3.2 The Bakong Payment System

In Cambodia over the past few years, the increase in mobile subscriptions and greater access to information communication technology (ICT) infrastructure have significantly changed the way people make payments. Digital forms of payments have gained popularity, given their convenience, security, and cost-effectiveness. The COVID-19 pandemic amplified calls for greater access to digital payments from cash usage to mobile/internet payment, to QR code scanning.

After a year of pilot testing, the Bakong payment system was introduced in October 2020. Among the major features, Bakong is a digital wallet introduced by the central bank as well as a backbone payment system connecting payment players to each other, and it adopted a two-tier system where the first tier is the relationship between Bakong and its members while the second tier is the relationship between the members and the end users. With this arrangement, the central bank is only liable to the member institutions and the later are liable to the end users. Bakong is an account-based application instead of being token based like other cryptocurrencies/or the conventional definition of central bank digital currency. Its users are registered and identified by member institutions instead of the central bank. Such accounts are subject to transaction limits and are zero interest bearing. Bakong users are able to redeem their accounts at any participating institution. The processes such as the clearing and settlement among member institutions with pre-funds held at the central bank is done through the Bakong engine (Bank for International Settlements 2018).

Among the motivations behind the introduction of the Bakong payment system, promotion of the adoption of local currency is also a major consideration. Bakong offers interbank payment and settlement as well as peer-to-peer

transactions on a real-time basis in both local currency and foreign currency, which is more efficient in terms of cost, speed, and security. Prior to Bakong, customers opening bank accounts or wallet accounts could choose either US dollars or KHR accounts, or both. There is a conscious choice about the type of currency people want to use to open an account. Most of the time, a US dollar account is the default, mainly due to the income currency that people receive and the perceived ease and convenience of having one account to manage. With the introduction of Bakong, registered customers can automatically access both KHR and US dollar accounts without having to choose one currency. The presence of KHR currency by default on the wallet not only raises awareness of the KHR as national currency, which many tend to forget when they adopt US dollars as their preferred currency, but also allow KHR users to pay in KHR to Bakong wallet users without losing on the conversion (Carstens 2020; World Economic Forum 2021).

Bakong infrastructure allows connectivity and access to wider institutions, including commercial banks, microfinance institutions, and payment service institutions, and thus can reach the vast majority of the population with access points in both rural and urban areas. This allows people to conduct digital transactions and to do so in local currency in more convenient ways than ever before. Given that the level of digital dollarization in Cambodia is already high, the minimal switching cost would gradually improve local currency transactions once the long-term exchange rate is stable and internal demand is gradually increasing.

The history of dollarization in Cambodia is unique. Its root cause was not macroeconomic instability, but rather the dark history of Cambodia in the last century, when the national currency was abandoned and changed; this created negative public perceptions. Despite the fact that macroeconomic conditions have been stable over the past 30 years, concern about local currency vulnerability has remained. The introduction of Bakong will help build public confidence in the local currency and will gradually shift behavior towards its adoption.

Given that promotion of local currency is a long-term objective, the introduction of the Bakong system is only one of myriad policies put in place to promote local currency. But given how recently it was launched, it is too early to conclude that the desired outcome of the Bakong system has been achieved. Further investigation along with additional efforts, especially in terms of public promotion and understanding, and fine tuning of the Bakong system in accordance with public demand, should promote large-scale adoption. Incentivizing measures can then be used to promote the usage in local currency when appropriate. While having similar features to the CDBC, the implication of Bakong adoption in term of monetary policy, financial stability, financial intermediation, private sector competition, and especially digital dollarization should not be overlooked, which means further study is needed.

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7 Dollarization in Other Emerging Economies and Developing Countries

Kazue Demachi

7.1 Introduction

The term "dollarization" came into common use around the end of the Bretton Woods period in the early 1970s. Under the Bretton Woods system, the discussion of international currency relationships was typically based around the official role of the US dollar as an anchor to which other countries pegged their currencies. In a study of the role of an international currency, Krugman expressed that "hardly anyone still pegs to the dollar" (Krugman 1984: 269). Nevertheless, while that may have been the atmosphere just after the breakdown of the Bretton Woods system, given the discussion about dollarization in this book, many still peg their currency to the US dollar today.

As the international market expands and becomes integrated, and world trade grows, the critical issues and the topics discussed in relation to dollarization have shifted over time. For example, in the aftermath of the financial crises and high inflation period in the Latin American countries and the Asian financial crisis of the 1990s, the focus was on currency regimes with debates swirling about whether emerging economies should "hard peg" or "free float" their currencies (Calvo and Reinhart 2002). In the meantime, as the euro started to circulate in the integrated market, and as more and more emerging and developing countries became involved in the global financial market and world trade through the 2000s, topics such as dollarization (euroization) of asset and dollarization of liability have also gained importance, especially for the emerging and developing countries.

Given the vast number of studies of dollarization and its wide-ranging relevance in macroeconomic issues, any exhaustive categorization of the studies on dollarization is a weighty task. The aim of this chapter is to review the currency substitution, dollarization, and euroization of developing and emerging economies by the selected issues and topics to highlight the experiences of dollarization in Cambodia. In this chapter, the term "dollarization" is used to denote the use of foreign currencies in domestic economic activities, including the use of currencies other than the US dollar. Following existing studies, the term "currency substitution" is used to denote the situation where foreign currencies are used in daily cash transactions.

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The currency regimes of countries, along with the existence of capital controls, have distinct relevance to the dollarization of an economy, as dollar-pegging eliminates exchange risks and props up the benefit of financial dollarization. The currency regimes reflect the economic, historical, geographic, and political ties between countries. Holding an exchange policy that anchors the local currency to a foreign currency is strictly different from opting for dollarization. Nevertheless, anchoring to a specific foreign currency reveals relationships between countries, and we can obtain useful insights into characteristics of the dollarized economies from their currency regimes.

Tables 7.1 and 7.2 summarize the countries that peg their currencies to the US dollar and the euro, with a simple classification of the countries' characteristics as of 2019. According to the IMF definition, currency pegs vary from having "no separate legal tender" and currency board systems to several different types of soft peg. Since 2016 the Annual Report on Exchange Arrangement and Exchange Restriction (AREAER) has reported on the distinction between "US dollar," "euro," "composite," and "other" regarding the exchange rate anchor under the monetary policy framework (Index III.E.1.a to III.E.1.d.), and Tables 7.1 and 7.2 are based on this information. There are also the countries that peg to multiple currencies, but such cases ("composites") are omitted here for simplicity. In this report, Cambodia is categorized as a country that anchors its exchange rate to the US dollar, but the arrangement is expressed as "other managed arrangement" with an explanation that mentions the "high degree of financial dollarization."

Table 7.1 shows that we can reasonably expect a country to be US dollar-pegged if the country is a small state (especially islands) in the Caribbean or in Central and Latin America, is an oil exporter, or is closely related to the

Table 7.1 The groups of dollar-anchoring countries as of 2019

ECCU (6)	*Caribbean and Central, and Latin America (18)*	*Oil exporters (11)*	*Other small states (6)*	*Other (3)*
Antigua and Barbuda, Dominica, Grenada, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines	Aruba, Bahamas, Barbados, Belize, Curaçao and St. Maarten, Ecuador, El Salvador, Guyana, Honduras, Nicaragua, Panama, Trinidad and Tobago	Bahrain, Iran, Iraq, Jordan, Lebanon, Liberia, Oman, Qatar, Saudi Arabia, Turkmenistan, UAE	Djibouti*, Maldives, Marshall Islands, Micronesia, Palau, Timor-Leste	**Cambodia**, Eritrea, Hong Kong*

Source: The author's grouping based on the Annual Report on Exchange Arrangement and Exchange Restriction 2019 (IMF 2020) and the IMF AREAER Online database (IMF 2021).

Note: Countries with * have adopted the currency board system. ECCU denotes the East Caribbean Currency Union.

Table 7.2 The groups of euro-anchoring countries as of 2019

Europe (8)	*CFA Franc (14)*	*Other colonial ties (3)*
Bosnia and Herzegovina*, Bulgaria*, Croatia, Denmark, Kosovo, Montenegro, North Macedonia, Republic of San Marino	Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Republic of Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea-Bissau, Mali, Niger, Senegal, Togo	Cabo Verde, São Tomé and Príncipe, Comoros

Source: The author's grouping based on the Annual Report on Exchange Arrangement and Exchange Restriction 2019 (IMF 2020) and the IMF AREAER Online database (IMF 2021).

Note: Countries with * have adopted the currency board system. CFA denotes both of the Communauté Financière d'Afrique (for West African states) and Coopération Financière en Afrique Centrale (for Central African states).

oil exporters' economies. On the other hand, Table 7.2 clearly shows that euro-pegging countries are also often small states and in geographic proximity to the euro area or share colonial ties with members of the European Monetary Union. Obviously, small states—especially the "small developing states" defined by the IMF and the World Bank—see certain merit in formal dollarization or pegging to a hard currency, as such countries are limited in their ability to provide public services and achieve macroeconomic stabilization due to institutional and human resource constraints (IEO 2020). Having their own central bank and managing their own currency may be too costly for such economies. The relationship between dollarization and being an oil exporter will be discussed in detail below.

This coarse grouping highlights the uniqueness of the dollarization that has occurred in Cambodia. In Table 7.1, only three countries anchor their currencies to the US dollar regardless of their geographic location and export share in crude oil. In terms of economic size, Eritrea is relatively small, and the dollar-peg of Eritrea can be explained as a result of difficulties after long conflicts with Ethiopia, which ended in 2000 (Honda and Schumacher 2006). Eritrea's currency, the nakfa, was introduced in 1997 to replace the former currency, the Ethiopian birr. Eritrea's *de jure* currency regime was floating but using dual exchange rates immediately after the end of the conflict and was shifted to a dollar-peg in 2005 (IMF 2021). In a study about dollarization in Sub-Saharan Africa, Mecaguni et al. (2015) refer to the financial dollarization in Eritrea but its degree before 2007 was reported to be not as high as other countries. Hong Kong's case is deeply rooted in its colonial history and is more complicated. Its currency board system stems from British colonial rule and switching the anchor from the pound sterling to the US dollar was the result of the decline of sterling through the Bretton Woods period and its flotation on the collapse of that system (Schenk 2009). In this regard,

the Cambodian case seems to be close to the Eritrean situation, as both have been torn by conflicts. However, as discussed in Chapter 2, the uniqueness of Cambodian dollarization is not its initial condition at the introduction of the dollar but the continuation of dollarization and currency substitution amid steady economic growth. Other countries that have experienced a high degree of dollarization had anchored their currencies to the dollar, but in most case the policy was short-lived once stabilization of currency value and the macroeconomy were achieved.

The rest of this chapter is organized as follows: section 7.2 presents a review of conventional and stylized arguments on dollarization; section 7.3 focuses on the structural aspect of dollarization in the world; section 7.4 deals with the selected topics regarding dollarization, which recently attracted more attention because of the integration of world markets; section 7.5 concludes with remarks on a more comprehensive view of partial dollarization to cope with the highly integrated international economy.

7.2 Conventional Arguments on Dollarization

Given the increasing speed of capital circulation in the global market today, most domestic economies are experiencing partial dollarization of assets, liabilities, or trade settlements to some extent. In this regard, the full dollarization of an economy or currency substitution in real transactions can be regarded as a special case. While several countries have voluntarily adopted a foreign currency as their legal tender, various incidences such as war and conflicts, or hyperinflation and financial crisis render a local currency unreliable and valueless, resulting in dollarization.

7.2.1 Voluntary and Formal Dollarization

According to the Annual Report on Exchange Arrangement published by the IMF, there are 13 countries that officially do not have "separate legal tender," and of these seven countries use US dollars and three use the euro as their currency of circulation, while the rest use the Australian dollar (Table 7.3) (IMF 2020: 7). Panama is often quoted as the only case of dollarization officially admitted by the United States, given the "very close historical, political, and economic links" (Berg and Borensztein 2000). Based on an agreement in 1904 between Panama and the United States, Panama officially adopted the US dollar as legal tender (Eichengreen and Hausmann 1999). Panama is now known as a tax haven, and Eichengreen and Hausmann (1999) point out the irony that, instead of the economy benefiting from the transparency and currency stability that dollarization is expected to allow, the oversized financial system of Panama is functioning because of the enhanced financial secrecy that followed the law passed in 1959.

Ecuador also voluntarily adopted the US dollar as its national currency in March 2000, followed by El Salvador in January 2001 (Calvo and Reinhart

Table 7.3 The countries with no separate legal tender as of 2019

No other separate legal tender	#	*Countries*
US dollar as legal tender	7	Ecuador, El Salvador, Marshall Islands, Micronesia, Palau, Panama, Timor-Leste
Euro as legal tender	3	Kosovo, Montenegro, San Marino
Australian dollar as legal tender	3	Kiribati, Nauru, Tuvalu

Source: The Annual Report on Exchange Arrangement and Exchange Restriction 2019 (IMF 2020) and the AREAER Online database (IMF 2021).

2002; IMF 2002; Swiston 2011). Other voluntarily and fully dollarized countries are the Marshall Islands, Micronesia, Palau, and Timor-Leste. On the other hand, Kosovo, Montenegro, and San Marino have "officially" and voluntarily euroized. Among these countries, Timor-Leste and Kosovo have suffered conflicts. Honda and Schumacher (2006) explain that the choice of full-dollarization in Timor-Leste was made due to the country being unable to introduce a new currency in the post-conflict turmoil and the importance of the US dollar to its trade. In Kosovo, on the other hand, the Deutschmark had been widely circulated before the conflict, and after the conflict, the economy shifted to de facto dollarization with the Deutschmark, then with the euro (Honda and Schumacher 2006).

7.2.2 Dollarization in Post-Conflict Economies

While some post-conflict countries such as Timor-Leste and Kosovo formally adopted a foreign currency as their legal tender, other countries introduced their new local currency. One of the most conspicuous cases of this form of dollarization is Cambodia. The Cambodian experience can be considered a forced and inevitable shift into currency substitution. As discussed through this book, dollarization in Cambodia stems from the Pol Pot regime in the 1970s, but the persistence of dollarization is due to various elements such as the inflow of aid money, foreign direct investment, trade earnings, and the inertia of the currency use, which is usually explained as the existence of network externalities (Duma 2011; Odajima 2017; Zamaróczy and Sa 2002). It is not the dollarization itself, but the persistence of the high degree of dollarization in Cambodia, that makes it a remarkable case.

Honda and Schumacher (2006) analyze the pros and cons of full dollarization in post-conflict economies and argue that loss of seigniorage may have a detrimental effect, especially on commercial banks, which can harm reconstruction and growth. They also note that while a few post-conflict countries opt for full dollarization, most countries prefer to have their own currency despite strict constraints in institutional capacity. However, as in the case of Cambodia, many post-conflict countries experience partial dollarization regardless of their *de jure* currency regimes.

7.2.3 Hyperinflation and Dollarization in Latin America

From the 1970s to the 1990s, many emerging countries, especially the Latin American economies, experienced hyperinflation. These financial crises were triggered by government fiscal and financial mismanagement, which resulted in mistrust in their local currency and in currency substitution. Having the Latin American cases in mind, Barajas and Morales (2003) categorize their dollarization as "fatalistic." While episodes of hyperinflation can be found worldwide, the crises in the Latin American countries were complicated as they were a compound of domestic financial crises, public debt crises, international balance crises, currency crises, international debt problems, and capital flight. The problem was even more complicated by close economic ties with the United States.

Figure 7.1 shows the annual inflation rate of the selected Latin American countries. Their hyperinflation dwarfs other Latin American countries' inflation rates, even though other countries also experienced relatively volatile price changes during this period. One of the earliest hyperinflations in Latin America was observed in Chile. Chile had liberalized the currency exchange rate and capital account already in the 1960s to promote growth, but a change in political power reversed this policy. According to Herrera and Valdés (2004), the purpose of the first liberalization of the Chilean economy was to partially dollarize credits and loans in the financial sector. Chile experienced hyperinflation in 1974, but thereafter the economy has succeeded in macroeconomic management and de-dollarization. Herrera and Valdés argue that the key in the Chilean de-dollarization was indexation, but they also argue that the success story cannot easily be transplanted to other economies as its implementation was conditional on several factors such as regulations in the banking sector, restrictions on capital account, and institutional development.

Bolivia experienced hyperinflation and dollarization in the 1980s. The root cause of this crisis was the behavior of the government, which covered its spending by printing money; the annual inflation rate reached 1,281% in 1984 and 11,750% the following year (Mann and Pastor 1989). Mann and Pastor mention that the attempt to stabilize exchange rates to stop hyperinflation induced currency over-valuation, resulting in the maintenance of dollarization. In 2001, the ratio of bank deposit dollarization in Bolivia was still as high as 90%, the second-highest ratio only after Cambodia. In the same period, Argentina also experienced a high inflation rate, reaching 198% per month in 1989 (Kamin and Ericsson 2003). The Argentine government implemented a series of disinflation programs from 1985, but assets and real payments were dollarized. Kamin and Ericsson (2003) suggest that, though not officially surveyed, Argentina should have held considerable sums in US dollars to be used in daily transactions. The experiences of Bolivia and Argentina are remarkable because of the persistence of a high degree of dollarization even after the achievement of price stabilization. In the case of Argentina, the persistence of financial dollarization through the 1990s eventually turned out to

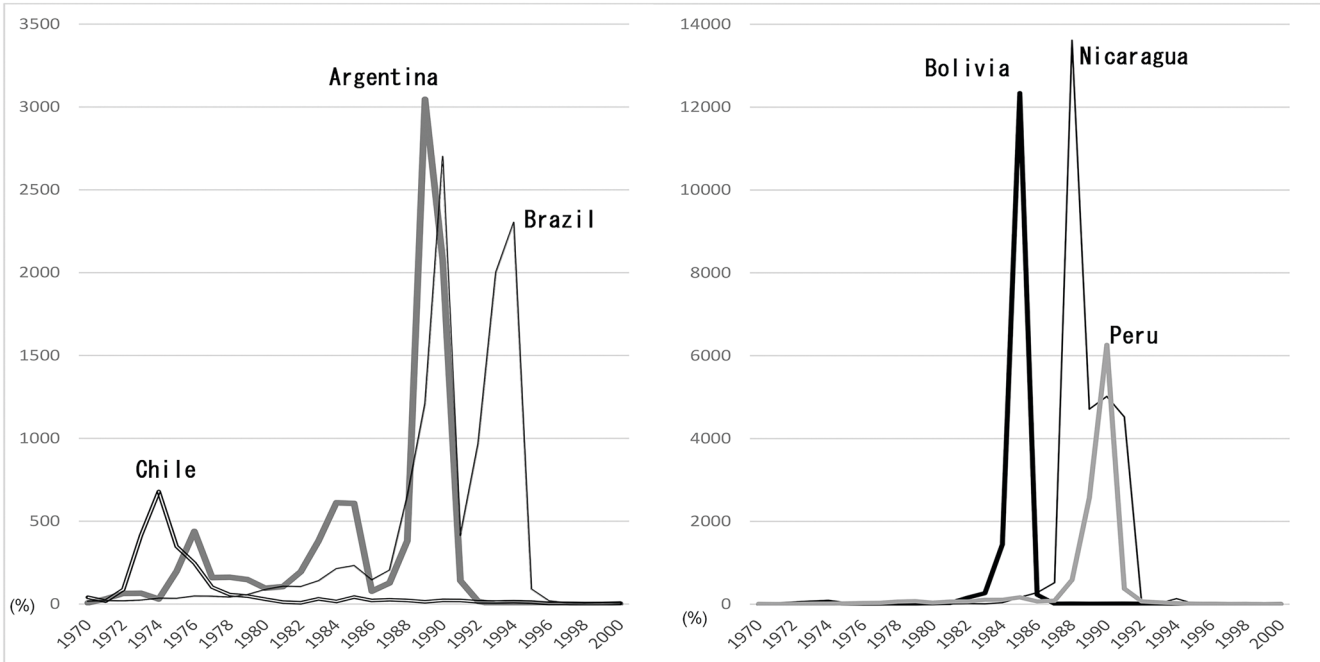

Figure 7.1 Hyperinflation of selected Latin American countries

be one of the factors behind the financial crisis in the 2000s. While continued dollarization is a common feature in Latin American countries and Cambodia, the reaction by their financial authorities was different.

In the aftermath of hyperinflation, Argentina adopted a Convertibility Law and introduced a currency board system in 1991, which lasted until 2002. De la Torre et al. (2003) describe the Convertibility Law as a form of social contract that "produced a non-reversible break from monetary and financial instability." This irreversibility is precisely the difference between dollarization and the currency board system. Both dollarization and the currency board system are regarded as a hard peg in terms of currency arrangement. However, the currency board system is reversible, while dollarization usually is not. As Berg and Borensztein (2000) argue, de-dollarization is hard to achieve, which is why dollarization is effective in regaining the credibility of financial policy and stabilizing an economy. The Argentine case itself proved the difference among the hard peg regimes. The direct causes of the collapse of the Argentine currency board system were a run on the banks and a domestic financial crisis (De la Torre et al. 2003). The agreed view is that the root cause was financial dollarization, or the dollarization of liability in Argentina (Barajas and Morales 2003; De la Torre et al. 2003). De la Torre et al. (2003) describe the Argentine economic situation under the currency board system as the "currency-growth-debt trap." As financial dollarization was accompanied by financial liberalization, the increase in capital flows heightened the currency risk for the banks, and the slower than expected economic growth heightened the risk premium for Argentine debts. This failure in fiscal management also suggests that hard peg is not sufficient to enforce fiscal discipline. Finally, many studies of Latin American economies imply that mismanagement of the domestic economy has triggered dollarization, but the dollarization was also possible because of the various policies for economic liberalization. Opening up of trade led to an increase in imports, which induced deficits in trade balance and an accumulation of external debt.

7.2.4 Fatalistic but Formal Dollarization

While the dollarization associated with hyperinflation in the Latin American countries was thus fatalistic but informal, the case of Zimbabwe, which also suffered from hyperinflation, was formal. Dollarization in Zimbabwe has been observed since around 2009. Zimbabwe's economic turmoil and crisis resulted from protracted economic mismanagement and the dictatorship under President Mugabe, who served for 37 years as the head of the country, and the subsequent political turmoil under his successors since 2017.

The repeated currency redenominations and the issuance of banknotes such as the 100 trillion Zimbabwean dollar note in the middle of hyperinflation attracted people's attention. In February 2009, Zimbabwe officially adopted a multi-currency system by suspending legal tender, allowing only the five foreign currencies (US dollars, South African rand, euro, pounds sterling, and

Botswana pula) to be used for tax and other official payments. However, it was almost full dollarization in reality. Southall (2017) points out that while the dollar and the rand were the two main currencies up to 2016, the rand was replaced by the US dollar as the value of the rand decreased. This Zimbabwean experience suggests that a currency of an emerging economy, where exchange rates are highly volatile, is not equipped to bear the currency substitution, even though the economy of South Africa is the largest and strongest in the region. The Zimbabwean case was government-led formal dollarization, and the government used US dollars to denominate the budget expenditure (Kramarenko et al. 2010: 3). However, because of the serious shortage in liquidity in the market, in 2016 the Reserve Bank of Zimbabwe introduced "bond notes" at par with the US dollar, backed by the foreign exchange established overseas by the support of the African Export-Import Bank, to relax the cash shortage (IMF 2018; Southall 2017).

The experience of Zimbabwe is different from the Latin American dollarization and the Cambodian dollarization in that the inflow of foreign currencies, including the US dollar and the South African rand, to Zimbabwe was severely limited. The dollar shortage was due primarily to poor export earnings, but also sanctions imposed by Western countries and international organizations. The government of South Africa also set strict capital account controls, which restricted the usage of the rand in Zimbabwe (Kramarenko et al. 2010). It is worth noting that the South African government does allow neighboring countries to use the rand as legal tender under the Common Monetary Area agreement (Table 7.4). This also implies that country size matters in the use of a foreign currency as legal tender, as the inflow of foreign currency needs to supply enough liquidity to the market. In the Latin American countries, people had relatively easier access to US dollars through the existence of local subsidiaries of US enterprises and banks, and the inflow of the dollar was enough to provide liquidity due to geographical and economic proximity to the United States (Walter 1985; Kamin and Ericsson 2003). According to the IMF (2020), Zimbabwe has resumed the use of the Zimbabwe dollar as the sole legal tender in that country. However, the annual inflation rate was reported to be as high as 557.2% in 2020, and the situation seems far from meaning the *de facto* end of dollarization.

7.3 The International Economic Structure and Dollarization

The dollarization phenomenon in the world, especially the cases of literal dollarization using US dollars, stems from the historical position of the United States in the international currency regime in the post-war period. The central role played by the US dollar, especially during the development process of the euro currency market (where it is "the medium of exchange" in the interbank market, as Krugman indicates) and the international commodity market, stipulates the ways in which world commerce and investment can function today (Krugman 1984).

Table 7.4 The countries anchoring to other currencies as of 2019

Country	*Peg currency*	*Notes*
Bhutan and Nepal	Indian rupee	Based on the agreement with the Bank of India and associated with strict exchange control regulations and other requirements.
Brunei Darussalam*	Singaporean dollar	Based on the bilateral Currency Interchangeability Agreement since 1967.
Kiribati, Nauru, and Tuvalu	Australian dollar	The Australian dollar is the legal tender of the countries.
Eswatini, Lesotho, and Namibia	South African rand	Based on the Common Monetary Area agreement among the four countries. The South African rand is legal tender in each country along with their local currencies, and the central banks are required to have at least an equivalent amount of foreign reserves to issue their local currencies (Kramarenko et al. 2010).

Source: The Annual Report on Exchange Arrangement and Exchange Restriction 2019 (IMF 2020) and the IMF AREAER Online database (IMF 2021).

Note: Countries with * have adopted the currency board system.

7.3.1 Oil Exporters and Dollarization

Commodity exporters such as the oil and mineral exporters have little choice in currency when invoicing in international trade. The price of the most traded commodity in the world, crude oil, is conventionally denominated in US dollars. Today, the oil exporters must receive the export proceeds in US dollars, and the oil importers in the world also must have US dollars to purchase crude oil, though this was not necessarily the case before 1974, as discussed below. This institutional setting of the international commodity market obviously affects the monetary policy and currency regimes of commodity exporters. For example, Saudi Arabia maintains hard peg to the dollar, and the rate has been unchanged since 1986 (Al-Hamidy and Banafe 2013). As long as the countries depend exclusively on such commodity export, this currency arrangement ensures stability for their currencies and also for their assets, but only if the countries have enough reserves to counter currency speculation. At the same time, too strong a link to the US dollars may harm the diversification of an economy and its growth, especially when the value of the dollar appreciates.

Mecagni et al. (2015) also point to the relationship between dollarization and commodity exports in the context of the Sub-Sahara African (SSA) countries. They show that dollarization in the SSA countries is relatively and constantly high. As most countries in the region are commodity exporters, their

trade proceeds are also in US dollars. The analysis by Mecagni and colleagues is highly valuable, as analyses of dollarization in the SSA countries are scarce. However, given the limited degree of financial inclusion in most SSA countries and the strictly limited availability of related statistics, it seems to provide only a limited picture of dollarization in those countries. On the other hand, several countries in the Caucasus and Central Asia (CCA) regions are also oil exporters. For example, as shown in Table 7.1, Turkmenistan is an oil exporter pegging its currency to the US dollar. Horton et al. (2016) includes Armenia, Azerbaijan, Georgia, Kazakhstan, the Kyrgyz Republic, Tajikistan, Turkmenistan, and Uzbekistan in the CCA countries, and analyzes the exchange rate management of these countries. Of the eight countries, Azerbaijan, Kazakhstan, Turkmenistan, and Uzbekistan are oil exporters. According to their estimates, most CCA countries have a high degree of financial dollarization, especially concerning deposits, but on average the degree is higher in non-oil exporters than for oil exporters. Horton et al. (2016) mention that while Turkmenistan is the only country that *de jure* pegs its currency to the US dollar, many other countries also anchor their currency to the US dollar in reality. They suggest that the high degree of financial dollarization is one of the factors of resistance to the IMF's recommendation of higher flexibility in exchange rates. A strong linkage with the US dollar harms diversification of the economy by weakening export competitiveness due to currency overvaluation. This point relates to the argument of "fear of floating," although it may be more precise to describe it as the absence of incentive to float. Horton et al. (2016) point out that net importers prefer currency appreciation (or an overvalued strong currency). This is also the case for the oil and other commodity exporters, as their exports are insensitive to exchange rate fluctuations.

It is also worth noting that the CCA countries have close economic ties with Russia, especially with regard to imports and remittances. The economic ties indicate that the money inflows from remittances might be in Russian rubles. However, the currencies of the CCA countries are historically and strongly linked with the US dollar, which stems from the high inflation in the transition period and commodity exports (Horton et al. 2016).

7.3.2 Remittances as the Source of Dollar Inflows

Dollarization in any form cannot be materialized without an inflow of foreign currency. In this sense, the extension of international financial activities should inevitably increase the degree of dollarization in each country. In the Cambodian case, the foreign currency brought by the United Nations Transitional Authority in Cambodia (1992–1993) was the initial source for currency substitution. While this may be a special case among numerous dollarization episodes, several other issues also contribute to dollarization, and international remittances are among these.

According to the *Migration and Remittance Data* published by the World Bank, the amount of international remittances increased more than five times

between 2000 and 2020 (World Bank 2021). Except for the developed economies, India, Mexico, and the Philippines were the top three recipient countries of international remittances in 2000. The situation changed slightly in 2020 as China ranked in the second position in terms of the amount of remittances received. If we see the dependence on remittances expressed by share of GDP, the top countries in 2020 are Tonga, Somalia, Lebanon, South Sudan, the Kyrgyz Republic, Tajikistan, and El Salvador. From these statistics, the association of the high dependence on remittances and a high degree of dollarization is inferred but not clear. The remittance inflow to Cambodia was estimated to be US$1,272 million in 2020, but its share of GDP is low at less than 2%.

On the other hand, the *Regional Economic Outlook: Middle East and Central Asia* published by the IMF in 2015 points out that the Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) are a vital source of remittance outflows to neighboring countries (IMF 2015). The primary income source of those countries is oil exports, and according to the IMF (2020) the currency regime of the GCC countries is reported as a soft peg to the US dollar. The neighboring non-GCC countries have strong economic ties with the GCC countries, as the remittance from the migrant workers in the GCC countries is significant for the economies such as Egypt, Jordan, Lebanon, Pakistan, and Yemen. For example, Hijazeen and Al-Assaf (2018) point out the strong linkage between Jordan and the GCC countries in that the monetary policy of Jordan seeks to align the exchange rate with that of the GCC countries, and therefore indirectly with the US dollar. Regarding Lebanon, the IMF (2015) points out the remarkably high degree of dollarization, especially in bank deposits and loans. The high degree of dollarization of bank deposits and loans reflects that private firms in Lebanon mostly transact and contract using US dollars. According to Bitar (2021), the hyperinflation during the civil war in Lebanon during the period 1975–1989 fostered the dollarization of the economy, and the continual liquidity inflow maintained the dollarized economy. Lebanon's *de facto* exchange rate regime has been dollar peg since 1997, and several organizations see the country as an offshore center or a tax haven (Palan et al. 2010). The country maintained a low inflation rate despite the large government debt and chronic current deficit until 2019. In 2020, the country was seriously hit by an economic depression due to the world pandemic and the government default, though their causal relationship is not apparent. There must be a strong linkage between the economies of oil exporters, the world oil price, and dollarization of the related economies, but analyses are scarce compared with studies on other regions such as Latin America.

7.3.3 International Trade, Invoicing, and Dollarization

Closely related to the earlier discussion about commodity exporters, an economy's dependence on international trade and the choice of currency

for trade invoicing are also tightly intertwined with financial dollarization. A currency used in the trade is called "vehicle currency" when it is neither the exporter's nor the importer's local currency. Studies of vehicle currency and the role of the US dollar as an international currency have been especially active since the end of the 1960s. In his study about vehicle currency, Krugman (1980) hints at the relationship between the invoicing currency and the size of the currency market. Krugman focuses on the structure of international exchange, especially in terms of the transaction cost in obtaining and converting to a certain currency in interbank markets. It is beneficial to use a historical example to understand the different roles played by a currency used in trade and invoicing. The world oil price was conventionally denominated in the US dollar, but oil exporters in the sterling area accepted payment in sterling until 1974 when Saudi Arabia, which had a strong voice in the OPEC, decided to refuse payments for oil in sterling (Basosi 2020; Krugman 1984; McKinnon 1979). However, the roles played by different currencies seem to have converged to one, as the existence of the US dollar became dominant. After the Bretton Woods System collapsed, the US dollar continued to play the role of the key currency in the international economy. Therefore, we rarely question the current situation where most international trade, invoicing, and settlement are denominated in US dollars, even in non-commodity trades. However, as Krugman (1984) illustrates, in the 1960s most trades were denominated either by the exporter's currency or the importer's currency, and it was the same at the end of the 1970s—especially for relatively large economies, except for Japan. This suggests that there was "dollarization of invoicing" as the currency regime and the structure of international trade have changed drastically.

Regarding recent international trade, Gopinath (2015) shows that the share of trade using US dollars for invoicing still far outweighs the share of the United States in world trade and that many countries use the US dollar as the vehicle currency. However, since the introduction of the euro in the European Monetary Union, cross-border trade has increased. Boz et al. (2020) show that the euro is gaining dominance as a vehicle currency in some regions, especially in non-euro Europe and Africa, and the increase seems to be reflecting a shift away from the US dollar as the invoicing currency.

The choice of invoicing currency is important because it determines the currency of trade proceeds. For example, regarding Cambodia, Duma (2011) points out that US dollar inflows as export earnings, tourism receipts, foreign direct investment, and foreign aid influence the dollarization of the Cambodian economy. However, the relationship between the currency of trade earnings and domestic dollarization is not simple, as the degree of financial dollarization itself largely depends on a country's institutional setting (Savastano 1996). On the other hand, Kokenyne et al. (2010) point out that the policies related to capital control, such as the compulsory surrender requirement of trade proceeds, clearly impact de-dollarization. According to the AREAER database, 75 countries put a certain type of surrender requirement in 1999,

but the number decreased to 52 in 2019. If we look at the number of countries that put the surrender requirement for capital transaction proceeds, the number has increased from 29 countries in 2006 to 44 countries in 2019. This tightening trend might be due to the increase in capital inflow to the emerging economy after the international financial crisis. Cambodia had capital control on proceeds from invisible transactions and current transfer, though this was only applicable to the earnings by the state-owned enterprises. The restriction was lifted between 2002 and 2003. There was a regulation between 2010 and 2014 that stipulated the surrender of exports proceeds to authorized dealers, but it was quite lax as the exporters were allowed to retain the foreign currency as long as the proceeds were saved within domestic accounts. There is no capital control or surrender requirement reported by Cambodia between 2011 and 2019 (IMF 2021).

7.4 Financial Dollarization in the Highly Integrated International Market

In the aftermath of the Asian financial crisis, there was a surge in bipolar arguments on the suitable currency regime for emerging economies (Berg and Borensztein 2000; Calvo and Reinhart 2001). The bipolar view on currency regime is directly linked to the bipolar view on dollarization. Calvo (2002) warns against both views, which recommend full dollarization and try purging foreign currency used in a domestic financial market. By stressing the "initial conditions" of emerging economies, Calvo argues that the use of foreign currencies in the domestic economy is necessary and critical in emerging economies. This argument is even more pertinent today as partial dollarization is prevalent in the world economy. Financial dollarization is a popular research topic, especially after the advanced economies suffered a series of financial crises in the late 2000s. This is because financial dollarization is often linked with higher macroeconomic risks, which are systemically transmitted through internationally intertwined financial markets and financial sectors. In this regard, the recent discussion about financial dollarization overlaps with that of international macroprudential policies.

7.4.1 Dollarization of Assets

As was the case for the Latin American countries that suffered hyperinflation, the extent of currency substitution and asset substitution increases as the value and the expected value of the local currency decreases. If we focus on the store-of-value function of money, this view on currency substitution appears to be natural behavior. On the other hand, there are different views on financial dollarization. For example, Ize and Levy-Yeyati (2003) argue that the portfolio model can explain financial dollarization. They illustrate that as long as financial dollarization is the matter of choice of portfolio denomination, there should be no wonder that disinflation is not associated with de-dollarization.

Their argument is remarkable as many Latin American countries experienced continued assets substitution despite their success in lowering inflation rates and stabilizing prices after the hyperinflation period. Ize and Levy-Yeyati (2003) introduce the minimum variance portfolio model to explain this and suggest that dollarization of assets may not fade away if the expected volatility of inflation (not the expected inflation) remains high.

Basso et al. (2007, 2011) argue that the interest differential between foreign and local loans affects asset substitution through the analysis of euroization in transition economies. They show that the entries and cross-border banking activities of the EU-origin foreign banks strongly influence financial euroization in the transition economies. They also suggest that the increase in foreign ownership of subsidiary banks in an emerging market leads to a sharp increase in foreign liabilities, and to currency mismatch in the portfolio of the borrowers.

Dollarization of assets raises the risks in the banking system that stem from currency mismatch and higher exposure to the changes in the exchange rate. Given the expansion of financial activities worldwide, the internationalization of banking activities is unavoidable. Mitigation of risks associated with financial dollarization requires not only the sound regulations by financial authorities in each country, but also an accorded guidance in international macroprudential policy (IMF-FSB-BIS 2016). Emerging economies require special care for their rapid market growth and changes, as suggested by the experiences of the Asian financial crisis, Serbia, and Uruguay (Lim et al. 2011). This view has been strengthened in the aftermath of the 2007–2008 international financial crisis and the economic and fiscal problems in European countries, especially as the negative side of the aggressive cross-border banking activities by the banks in the European Union has been revealed. The series of crises has led to the revision of the financial regulations on international banking activities. This movement can also be understood that the discussion of asset substitution and financial dollarization (euroization) has entered a new phase, where the currency mismatch is not to be purged away but rather to be coped with through the implementation of appropriate prudential standards.

7.4.2 Dollarization and Overseas Assets

The issues of financial outflows, such as capital flight and capital drain to tax havens, are usually not discussed under the category of dollarization. One of the few exceptions is Balinõ et al. (1999), who include cross-border deposits in measuring the degree of dollarization. Once an asset is transferred overseas, substitution is no longer a domestic issue. However, it is obvious that these problems have a common root in mistrust and distrust of the local currency, fiscal and financial policy, and the domestic financial system. The typical case of dollarization of assets overseas is in (that is, out of) Africa. African countries suffered unstable political and macroeconomic conditions from the 1980s to

the 2000s. Ndikumana and Boyce (2011, 2021) analyze the possible capital flight from African countries when assets are stored abroad. Especially for countries with weak financial institutions and regulations, focusing on foreign currency kept within the domestic economy will lead to serious underestimation of the dollarization of assets in those countries.

It is accepted that forced and rapid policies for de-dollarization can trigger capital flight. For example, Kokenyne et al. (2010) summarize the failures of forced de-dollarization policies and show that policies such as mandatory currency conversion of deposits and suspension of access to foreign currency have led to disintermediation and capital flight in Bolivia, Mexico, Peru, Argentina, and Pakistan. The dollarization of domestic assets is obviously in a back-to-back relationship with capital flight and increases in dollarized assets held overseas, especially in hidden offshore financial accounts.

7.4.3 Dollarization of Liability

The concern about dollarization was a hot topic after the Asian financial crisis. Eichengreen and Hausmann (1999) show that the countries hit by the financial crisis, such as Thailand and Mexico, experienced too high a degree of dollarization of liabilities that meant high risks of currency devaluation and currency mismatch. It is accepted that the sudden reversal of foreign capital flows that result in the withdrawal of dollarized liabilities to local banks and firms leads to severe financial crises. Dollarization of liability is especially precarious in emerging economies, as the majority of capital flows tend to be short term and the countries involved usually do not have alternative measures to committing the "original sin," as the domestic financial market is still too shallow to absorb and share the risks (Caballero and Krishnamurthy 2000; Eichengreen and Hausmann 1999).

However, it is not only the liability in foreign currency within each domestic market but also the public and private external debt issued overseas that has increased significantly on a global scale through the 2000s. In the background of this debt growth is the expansion of the international financial market, and the continued low-interest policies in the advanced economies up to 2021, which have boosted the search-for-yield attitude among investors in the world. What is closely related to this point is the increase of new entrants to the international financial market. Some of the new entrants are countries with low credit ratings, as they have defaulted on their foreign debt in the past. The most notable cases are the African countries. The prolonged process of debt cancellation for the heavily indebted poor countries (HIPCs) was finalized in the 2000s, and the countries started to issue sovereign bonds in the late 2000s (Demachi 2019). Given the relatively small size of their economies, each Eurobond issue is not a large amount in terms of the international market. However, its influence on the issuers' economies and governments must be significant, especially when the debt is not managed soundly.

On the other hand, regarding the Latin American countries, Levy-Yeyati (2021) reviews the recent changes and points out that, with the exception of Argentina, Venezuela, El Salvador, and Mexico, the general situation of the public and private external debt in Latin American countries decreased both in share (of total debt) and size in the period between 1999 and 2018. Levy-Yeyati also suggests that in those countries that reduced external debt, this was associated with the development of the domestic financial market, indicating that the domestic financial development can partly free the emerging economies from the "original sin."

7.5 Conclusion: Coping with Partial Dollarization

After reviewing the characteristics of dollar-pegged and dollarized economies, the special situation of Cambodia becomes clearer. Cambodia was torn by conflict, but not as a small country especially in terms of population, the economy is not based on commodity exports nor reliant on remittances, nor is it an international financial hub. Latin American experiences also highlight the Cambodian uniqueness in that the country has not implemented a decisive policy to consolidate the credibility of the local currency. As discussed in section 6.3, the capital control introduced in Cambodia in the past was tentative, partial, and lax. While the capital control policy has double-bladed effects on the stabilization of the macroeconomy, the questions to be asked regarding Cambodian dollarization may not be the reason for continued dollarization but rather the reason why the authority has opted for lax control of domestic foreign currency use.

It is widely agreed that sound macroeconomic management in each country lowers the degree of financial dollarization. Mecagni et al. (2015) refer to the fact that those countries with relatively flexible exchange rates have succeeded in lowering dollarization. While many argue for the importance of domestic financial market development for de-dollarization, Leiderman et al. (2006) show the effectiveness of inflation targeting policies. Armas and Vega (2019) and Garcia-Escribano (2010) also point out the importance of inflation targeting based on the experience of Peru. On this point, a well-functioning interbank market should play a critical role, as a central bank can influence the market through the intervention in an interbank market. Closely related to this regard, Laurens (2005) highlights the importance of the functioning interbank market for emerging economies, pointing out that even if an interbank market exists, it will not contribute to the development of the financial market if the interbank market does not fully function. According to the Annual Report on Exchange Arrangement 2019, there are only 19 countries reporting that they do not have a domestic interbank market (IMF 2020). However, the functioning of the interbank market is, in fact, limited in many countries. For example, in the Lao PDR, the absence of a well-functioning interbank market, both for local and foreign currency, seems to hinder the government's efforts at de-dollarization. In the case of the Lao PDR, banks

may join the auction for foreign currency, but the transaction counterpart is limited to the central bank (Demachi 2020).

Given that the world economies are integrated and interacting, it might be pointless to think about completely abating dollarization. There is a vast accumulation of information on the policies for de-dollarization. However, the view on dollarization and de-dollarization needs to be "eclectic," depending on each economy's condition, as argued by Rogoff on capital account liberalization (Fernández et al. 2015; Rogoff 2002). On the other hand, given the increasingly heightened risks and uncertainty in the interconnected economies, the internationally and regionally coordinated policies are indispensable for macroeconomic stability both in each economy and in the world economy more broadly.

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8 Strategies for Promotion of Khmer Riel

Vouthy Khou, Hidenobu Okuda, and Yasuhisa Ojima

8.1 Introduction

According to survey results (see Chapter 2), the degree of dollarization is not homogeneous across all regions in Cambodia. Dollarization is concentrated mainly in urban areas, where economic activities are more dynamic and exposed to foreign currency flows, especially in Phnom Penh, the capital. In the rural and central areas, the Riel dominates in payments, price quotations and even as a store of value.[1] Within these patterns, the US dollar is generally used for large transactions and imported goods, or in modern markets, while the Riel is essentially used in small payment transactions such as those for foodstuffs or in traditional markets, and in some large transactions in the agricultural sector. In the border areas, neighboring currencies are also used along with the Riel and US dollar. The Thai Baht (THB) is frequently used in areas close to the Cambodia–Thailand border, not only for the exchange of goods and services but also for financial transactions such as deposits and credits provided by formal financial institutions. On the Vietnam–Cambodian border, the Vietnamese Dong (VND) is also used for the exchange of goods, but to a very limited extent and not in financial transactions.

The degree of dollarization in the activities of an enterprise is not necessarily determined by its size, as other factors such as geographic distribution and sources of incomes and borrowings are important. In other words, there is no clear trend in the use of foreign currency in terms of enterprise size. Most enterprises, and in particular the foreign ones, declare that they use US dollar as an essential part of their activities; they receive revenues in US dollars and pay in US dollars, except for tax payments, and they also largely borrow in US dollars. There are a few enterprises using THB in their activities and borrowing in THB in the Cambodia–Thailand border areas. Naturally, it is quite convenient for these firms to use foreign currency, depending on their income and borrowing needs, as they can manage exchange rate risks by mitigating exchange rate losses and transaction costs when using different currencies in their activities. For some enterprises, mostly in the retail trade sector, the Riel is the main currency used in their financial operations. NBC also observed that some large enterprises in the agro-industrial and utilities

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sectors, for example, are operating using multiple currencies. Large rice millers pay farmers or even intermediaries in Riel, or to a lesser extent THB in the border areas, but pay their workers in Riel. If they were to export or sold their goods to retailers, they would receive incomes in foreign currency or Riel. The state-owned enterprises that provide utilities, such as water and electricity, receive their income in Riel, but they must convert the Riel to US dollars to pay their suppliers. These currency mismatches potentially expose them to exchange rate losses and risks.

With this use of multiple currencies, the currencies used in income and expenditure could be different, not only for households but also for enterprises. This situation is favorable to the development of currency exchange activities. As a result, there are many money changers, especially those of micro and small size, operating the currency exchange business in Cambodia, and they render this market as perfect competition. The money changers facilitate the use of foreign currency by minimizing the costs of holding it. We frequently observed that both foreign and local currency is often exchanged at non-currency exchange shops; the shop agrees to exchange because they need it for their operation—for instance, paying their wholesalers (normally in US dollars). Currency exchange helps these sellers to reduce exchange costs at the money changers or banks, and earn some profits in addition to their main business activities.

The financial sector is more dollarized compared with the real sector, as around 90% of financial transactions in this area operate in US dollars. This pattern results from the way currency mismatch risk is managed by the financial institutions whose source of funds is in foreign currency (i.e. dollarization through financial intermediations). However, MFIs use more Riel in their operations than commercial banks, especially providing credits to the poor and SMEs. Nevertheless, the recent trend of Riel operations in the microfinance sector during the survey period (2009–2013) was decreased. One pertinent explanation is that the MFIs are trying to reduce their currency mismatch risks by providing credits in the same currency as their source of funds (deposits and borrowing). This behavior of MFIs means they are transferring the risk of currency mismatch onto the shoulder of borrowers. In this context, the promotion of the Riel usage for loans is also justified.

The good economic performance of Cambodia prior to the COVID-19 pandemic has demonstrated that dollarization is not an obstacle to growth and financial sector development. In contrast, it has facilitated and promoted economic activities and integration into global markets. Nevertheless, dollarization could expose the country to risks and thus make the economy vulnerable to external and internal shocks. Dollarization imposes constraints on monetary policy implementation and effectiveness, and potentially limits central bank actions as a lender of last resort. In addition, further financial development may result in the reduction of cash-based transactions while increasing the level of credit expansion in the economy. This means the risk associated with the lack of function of the lender of last resort will be increased. The level

of damage with financial turmoil may be more severe than it was before the financial development.

Dollarization in Cambodia has persisted for a long time and does not seem to decrease if there is no concerted effort to promote the local currency. A World Bank (2015) report also mentioned that dollarization is likely to stay unless addressed. It is noted that macroeconomic stability is a prerequisite for the promotion of Riel, but the stability itself may not result in the expansion of usage of Riel. In the context where Cambodia's economy has grown robustly, with both macroeconomic and financial stability being well preserved but in a situation where the global and regional economy is facing growing uncertainty, it is in fact indispensable. However, it is time for Cambodia to impose effective monetary policies to protect the country from shocks to support the economy so it may grow sustainably. This may best be achieved by considering our survey results, which indicate that the following policies or measures to promote the use of Riel would contribute significantly to government policy formulation during this time of uncertainty.

8.2 De-dollarization Policies Until Recently

There is no single silver bullet for encouraging the use of local currency over foreign currency (Duma 2014). Rather, a combination of supportive and market-oriented measures is needed by avoiding forced and rapid de-dollarization. There would be several key elements to promote the use of Riel. A body of cross-country evidence suggests the role of a stable macroeconomic environment. Cambodia achieved macroeconomic stability over the past decade (i.e. low inflation, high growth, and credible fiscal position) as described in Chapter 1. The authorities need to aim for de-dollarization by building upon these achievements. The following subsections summarise de-dollarization policies until recently.

8.2.1 Enhance Confidence in the Riel

To further enhance confidence in the Riel, it is indispensable to sustain the momentum of the increasing trend of Riel use. To meet this end, the purchasing power of the Riel should be preserved. To do this, inflation should be maintained at a manageable level, and the Riel should not be largely depreciated. So far, the stability of the exchange rate between the Riel and the US dollar has served as an anchor of price stability and has promoted public confidence in the Riel. However, the maintenance of exchange rate stability between the Riel and the US dollar for many years is also a factor contributing to the existence of dollarization in the economy as economic agents may not change their behavior in using both the Riel and the US dollar as they do not perceive any exchange rate risks of holding both currencies. The stable exchange rate may also incite some households and firms to take loan in US dollars, although their main incomes are in Riel, putting them into a currency

mismatch situation. In case there is a big shock affecting the exchange rate volatility, this exchange rate risk could increase the risks of default, affecting both borrowers and financial institutions.

Thus, in the medium to long term, a more flexible exchange rate in accordance with economic fundamentals, and in particular a bias towards Riel appreciation, seems appropriate. In this context, inflation targeting could be a good option in relation to the development of a future monetary regime that can maintain price stability and at the same time leave the exchange rate more flexible after attaining significant level of usage of the Riel. The flexibility of the exchange rate could, for example, signal the market about the risks of holding US dollars when the dollar fluctuates. Notwithstanding the need for flexibility, the stability of the exchange rate should be maintained until confidence in Riel is strong enough. Then the exchange rate could be allowed to float in a gradual and careful manner. Furthermore, any suggestion that argues for the adoption of inflation targeting should be studied rigorously before it is implemented. Meanwhile, to further boost confidence in the Riel, wider usage of the Riel in terms of price tags and payments is necessary.

8.2.2 Promote Price Quotations and Payments of Goods and Services in Riel

Salary and wages are the most dollarized type of income compared with other sources of dollarization, followed by business activities. The latter may result from payments to employees in foreign currency by firms/companies whose revenues are in foreign currency, such as garment factories, foreign companies, supermarkets, and so on. Households then use this foreign currency to buy goods and services from enterprises and sellers. However, it is worth highlighting that, in the garment sector, even though employees receive their salaries in US dollars, only a small proportion of their expenditures are in US dollars (telephone services and rental housing). Apart from this, their spending is in Riel. According to our survey, nearly half of workers' salaries were transferred in US dollars to their parents/relatives in their hometown through a money transfer service. In most cases, their parents/relatives withdrew the transferred money in Riel or exchanged it to Riel quite quickly. Our survey also reaffirmed that households frequently exchange US dollars to Riel because they need Riel for their spending. Therefore, if salaries and wages were increasingly (gradually) paid in Riel, households would not suffer losses in exchange operations, especially as the prices of goods and services would be quoted in Riel. Business firms and other companies could also use one single currency in their operations when Riel is used for payments of salaries, as they currently have at least spent Riel on taxes and utilities. In this regard, the government should encourage firms and sellers to quote the price and payments of goods and services in Riel only, or at least alongside US dollars, and promote the payments of salaries and wages in Riel.

In the medium to long term, the government should require all firms and sellers to quote their price in Riel only and at least pay a portion of their staff wages in Riel. However, to ensure effective implementation, it is necessary

for the government to authorize a transitional period (for instance, one or two years) to prepare for the change from the price tag in US dollars to Riel. During this transitional period, based on the free will of the private sector, the price of goods may still be displayed in US dollars, but firms and sellers should gradually add price tags in Riel for their goods as well. After this period, the price tags of all goods will no longer be displayed in foreign currencies. Similarly, during the transitional period, salaries can still be paid in US dollars so that firms and their banks will have enough time to modify or adjust their recorded accounting processes from US dollars to Riel.

These supportive measures should gradually begin in both the public and private sectors; however, it is strongly recommended that the supportive measures for public sector should have been immensely enforced. Indeed, some of the government's revenues/expenses are still made in USD, such as the charge of visa fees, entrance fees at tourism resorts, service fees of some public institutions such as passport, medical treatment at public hospitals and tuition fees at public universities. All public entities should be the first organizations to demonstrate their strong commitment to promoting local currency by accepting only Riel. If not, it would be difficult to convince the private sector to gradually use more Riel in their services.

8.2.3 Promote the Opening of Bank Accounts in Riel

Although financial inclusion has increased during the past two decades, most of the Cambodian adult population has not yet had a bank account, and even fewer have had a bank account in Riel. Few banks have yet provided financial services (deposits/credits) in Riel, and most firms/companies have not opened bank accounts for their employees. Increasing the number of bank accounts opening in Riel would encourage the payment of salaries in Riel and the overall usage of Riel. It would reduce cash holdings and its associated risks, as well as facilitating the use of Riel through different types of payment instruments. It could also address the complaints about the inconvenience of holding too much Riel to make large payments or those about too many zeroes on the Riel notes. For instance, Odajima, Aiba and Khou (2019) have found that transaction size is significantly correlated with the preference for foreign currencies over local currency, while this effect is smaller for households with bank accounts, suggesting that increased bank account opening in Riel would further promote the use of Riel for the large volume of transactions. To achieve this end, the government, financial institutions, and companies should encourage the use of bank accounts denominated in Riel, and in the long run, a requirement for all firms to open bank accounts for their employees in Riel is essential.

8.2.4 Improve the Payment System and Financial Instruments in Riel

The payments system is a crucial part of the infrastructure of the financial system that could reduce cash-based transactions. In addition, it promotes

the greater use of Riel if the system is designed in favor of Riel. Therefore, the NBC has constantly put efforts into modernizing the payment system, such as the development of Fast Payment and Retail Pay. Recently, the NBC has also launched the Bakong system that uses Blockchain technology to promote efficient payment systems and financial inclusion in Cambodia, especially in rural areas where many people are unbanked but the use of Riel is high. In addition, a greater variety of Riel notes should be made available in ATM machines as well as increasing the numbers of ATM machines available. This will offer the possibility of using Riel more widely, as currently only a few banks put Riel notes in their ATM machines, and there are as yet very limited Riel denominations. Most ATMs contain only one denomination of Riel notes (10,000 Riel), with very few making two denominations (the 10,000 Riel and 20,000 Riel notes) available. Thus, it should be compulsory for all financial institutions to have Riel in all their ATMs with a variety of banknotes to provide more options for consumers, and the NBC stands ready to supply Riel notes in case of shortage. In the medium term, it is recommended to gradually withdraw the US dollar notes from ATMs, starting with the small-value banknotes such as $1, $5, $10 and $20 notes. The NBC should also try to absorb small US dollar banknotes from banks and financial institutions and only supply back the large denominations, allowing Riel to play a more important role in small-value payments.

According to NBC's survey, only a small percentage of the population uses the two largest Riel denomination notes. Therefore, it is important to promote the use of the largest note (100,000 Riel, equivalent to around US$25). In addition, the NBC should also consider issuing larger denominations (for instance, 200,000 and 500,000 Riel—equal to around US$50 and US$125, respectively) to raise the value of the Riel notes in circulation. The issuance of larger denomination banknotes would correspond to the demand for the higher value of notes as the value of economic and financial transactions becomes greater. Alternatively, it is worth considering the reissue of current Riel notes by removing two zeroes from each of them.

Finally, money transfers or remittances should also be carried out within formal financial institutions or by using agents to reduce the direct use of foreign currencies. Informal transfers have favored the use of foreign currency as the beneficiary who received it could then use it outside the formal banking system. By forcing this change, formal financial institutions could keep track of the flow of foreign exchange, and control its value relationship with the Riel, so that the banking system can well capture the foreign currency. Further study may be needed to promote the formalization of transfer through the banking system.

8.3 De-dollarization Policy and Financial Market Development

While macroeconomic stability is necessary for promoting local currency by enhancing its credibility, it is insufficient. The financial markets also need to

be developed further to help reduce risks associated with credit dollarization to nontradable sectors and to strengthen the interest rate channel of monetary policy transmission.

8.3.1 Improve Foreign Exchange Markets

An effective and formal wholesale foreign exchange market is essential to absorb foreign currency inflows and provide foreign currency when the market needs it, such as in responding to the demands of importers or for other transfers abroad. As the foreign exchange market in Cambodia is more of a retail market, mainly based on informal money changers, the inflow of foreign currency can be used outside the banking system. Thus, their transactions are mainly in cash. This favors the persistence of dollarization. Therefore, the foreign exchange market should be further developed toward a wholesale and formal market in which banks play a central role in responding to the demand for Riel, and to efficiently absorb foreign currency inflows to the economy. All money changers should be formalized and have a bank account with commercial banks. In other words, the relationship between money changers and the NBC should be indirect, via the commercial banks. Shifting the market power to banks from money changers would allow the NBC to have better access to a standardized and reliable data of daily exchange transactions across regions, which allows the central bank to better respond to the demand for Riel in the market. With more accurate market information by sectors or transactions, the NBC would be able to devise tailored measures to gradually de-dollarize the economy. Supporting banks to play a more important role in the foreign exchange market also requires the development of the interbank market where banks could have easy access to great amounts of different currencies when they need them.

8.3.2 Further Developing Interbank and Money Markets

There is currently no effective interbank market in Cambodia. The existence of an interbank and a more formal money market would allow banks and financial institutions to better manage Riel liquidity, and encourage them to use Riel in their operations. Currently, the formal interbank market is underdeveloped. Among certain major banks, there are established relationships through credits and deposits, but these are very limited and the market is lacking in several important instruments. Up to now, the NBC has paid great attention to the development of the market through the introduction of a new tradable debt instrument, the Negotiable Certificate of Deposit (NCD). Despite its gradual promotion, the NCD has yet to be used in the interbank operation; in other words, there is no secondary market for NCD at this time. Thus, the creation of a brokerage service to facilitate the interbank market transactions is necessary. The launch of liquidity-providing collateralized

operations (LPCO) aims to provide liquidity in Riel to financial institutions using NCD as collateral. These operations may contribute to the development of the interbank and money market in Cambodia. Furthermore, there is a need to continuously develop an active interbank and money market in favor of the Riel instruments, which will depend on the availability of instruments. In this context, short-term debt instruments, specifically Treasury Bills in Riel, should be created to support the demand for Riel.

8.3.3 Further Develop Securities Markets

A securities market was launched at the end of 2012, and there were eleven listed companies on the stock market and five listed companies on the bond market as of June 2023. Quotations in this market are solely in Riel. Although trade volume is still limited, the establishment of a securities market demonstrates to the public the government's strong commitment to the support of Riel and should mobilize funds in Riel that will further create supply and demand for the domestic currency. Likewise, the issuance of government bonds in local currency would facilitate the economy to move toward de-dollarization by creating a monetary instrument that would enable monetary authority toward an effective monetary policy that could influence the short-term interest rate by conducting open market operations to control money supply. The development of local government bond could also help minimize adverse shocks through targeting longer term interest rates and thus cost of borrowing. In addition, local currency bond issuance would put forward highly liquid and interest-bearing assets that would allow financial intermediaries to invest their excess resources in local currency. Furthermore, it also gives the rise to credit for the economy with reliable, credible, and risk-free assets that allow monetary authorities to exert better direction for and oversight of banks' behavior. This local currency domestic debt financing will provide relatively sustainable financing and contribute to reducing dependence on foreign debt and currencies, and will reduce risks associated with exchange rate fluctuations such as those currently faced by the government. In this spirit, in 2022, the government started issuing government bonds worth a total of KHR 72.1 billion (USD 17.6 million) with one year maturity and a coupon rate of 2.2 percent to be paid semi-annually.

8.3.4 Broaden the Clearing House's Policy on Lowering the Riel Transaction Fee to Market Fund Transfer

Currently, to promote the use of Riel, the NBC has charged lower transaction fees for Riel transactions than for US dollar transactions from clearing house members in accordance with the Clearing House Rules and Procedures. The NBC should broaden this policy by encouraging commercial banks, payment service providers, and microfinance deposit-taking institutions to offer their

clients a cheaper rate in Riel transactions than in US dollars (interbank and inhouse fund transfer). Given the popularity of digital payment among users in line with the emergence of e-commerce across the country during the COVID-19 pandemic, it is believed that this mechanism would contribute to widespread use of Riel in the market.

8.4 New Elements for the Promotion of Khmer Riel

With new elements of financial policy and prudential regulations, several measures could help to strengthen the use of Riel through: (1) a reserve requirement (e.g., higher for foreign currency; (2) deposit insurance (e.g., higher coverage for Riel); and (3) an international reserve (e.g., a sufficient level of international reserves to reduce the perception of weak Riel). Other measures could include Riel-listing requirements in the capital market, a tax-payment requirement, more convenient payments, and tax on foreign currency-denominated checks.

8.4.1 Promote Financial Intermediation in Riel on a Gradual Basis

According to an NBC survey, banks continue to operate almost entirely in US dollars, but MFIs operate in Riel as they provide more financial services to the poor than the formal banking system. During the survey period (2009–2013), the trend of Riel credits provided by MFIs decreased from 40% to 20% of total credits. This is a worrying trend, as MFIs are forced into trying to manage their currency mismatch risks when their sources of funds are in a foreign currency. In response to this, in 2016 the NBC announced that banks and financial institutions would be required to have at least 10% of their loan portfolio in Riel, a policy that needed to be fully implemented by the end of 2019. We have observed a gradual increase of Riel in total loans, yet further action should be taken to keep up the trend. The possible measures are as follows:

- In some dollarized countries, financial institutions are required to increase the proportion of their operations in local currency on a gradual basis. Thus, the central bank should increase the threshold for requiring banks and financial institutions to operate in Riel on a gradual basis.
- Develop hedging instruments for financial institutions that allow banks and financial institutions to obtain Riel liquidity when their sources of funds are in foreign currency.
- Gradually widen the reserve requirement rate on Riel deposits and US dollar deposits so Riel are more available to financial institutions for the provision of credits.
- Create a favorable environment for holding or having more local currency for banks and financial institutions such as the development of rules or procedures that are less costly in holding Riel funds than US dollars—for instance, allowing banks and financial institutions to access and use Riel

liquidity holdings at the NBC easier and more cheaply than US dollars. This could be done by allowing banks and financial institutions to have a multi-purpose account, including reserve requirements and payments in Riel.

- Promote deposit savings in Riel, giving priority to the poor and those living in rural areas. In general, households save money in terms of cash holding in their residences rather than keeping their cash in bank deposit accounts. This cash is effectively outside the financial system of the country. Although the amount of saving in foreign currencies is higher than that in Riel, in rural areas households save more Riel compared with those in urban areas. The poor also hold more Riel cash for their savings compared with the rich. Targeting that segment of households, the authorities should introduce deposit schemes favorable to the promotion of deposits in Riel. This type of scheme may have better preferential interest rates than the market rate, and could in turn be structured so that those who save using such a scheme over a longer period may enjoy preferential borrowing in Riel.

8.4.2 Fiscal Support for the Riel

The fiscal system is one of the key arenas for encouraging the use of local currency because willingness and positive attitudes from the government are prerequisites for public recognition and understanding of commitment to change. Through its roles, the government earns revenues both from tax and non-tax sources and also spends on consumption, wages, and investment. In this regard, the government could play a major role in creating demand and supply in local currency through fiscal measures. So far, public sector revenues from taxes and non-taxes are mostly in Riel. However, there are still some revenues collected in foreign currency, as mentioned previously, such as entrance fees to tourism sites, airport taxes, visa fees, rents, and so on. On the expenditure front, although all public wages are in Riel, some public consumption and most public investments are paid in foreign currencies. Therefore, if all revenue collection and all payments for consumption and investment are in Riel, the government would increase the demand for, and raise the supply of Riel in the economy. It may also consider making all expenditure associated with donor-assisted projects or NGO projects payable in Riel. In addition, the government should consider imposing taxes on revenues, profit, and any other form of tax on operations in Riel at a lower rate than the operations carried out in foreign currencies to provide incentives for economic agents to conduct their operations in the domestic currency.

8.4.3 Promote Public Awareness and Participation

Using US dollars has become deep-rooted in the mindset of the people, such that it has become a Cambodian habit to think and pay in US dollars. Thus, the policy on promoting the use of national currency cannot be realized in a subjective manner without changing the public mindset. In this connection,

the public has to be aware of the roles and usefulness of the national currency and the policies of the government, and take part in the process of promoting the preferential use of the national currency. Mainstreaming and encouraging participation can be done through various actions, including broadcasting, training, and/or at discussion forums between the authorities and the public or through the education system. The recent inauguration of the Museum of Money and Economy may play a key role in promoting the awareness of young people toward the importance of using the local currency as well, with the regular organization of school trips to the museum.

8.4.4 Enhance Cooperation for the Implementation of Effective Measures

Finally, promoting the use of the Riel is a macroeconomic issue that requires collaborative efforts in the preparation and implementation of consistent policy, as well as actual measures. Meanwhile, the cooperation framework must cover inputs from all of the key relevant parties in both the public and private sectors. Thus, a national policy to promote the use of the Riel is needed to promote the participation of all stakeholders.

8.5 Effectiveness of Promoting the Policy and Its Limitations

With the objective of de-dollarizing the economy based on the market mechanism and on a gradual approach, the NBC has implemented various policy measures to promote the Riel, and as a result the use of Riel has gradually increased in terms of deposits, credits, and payment transactions. For instance, over the last five years,[2] the amount of Riel in circulation has increased from 8.1 trillion to 14.1 trillion Riel; the credit in Riel has jumped from 4.3% to 12.5% of total credit in the banking system; and deposits in Riel have gradually increased from 7.4% to 11.2% of total deposits. However, some limitations remain:

8.5.1 Stronger Yet Still Limited Confidence

The implementation of measures to promote the Riel has led to more confidence among the public, yet people's experiences in past political and economic crisis, especially during the Khmer Rouge regime when the Riel was totally abandoned, continue to affect their feelings about holding a large amount of Riel, particularly in terms of savings. This phenomenon does not just occur in Cambodia; it also happens in other countries. For instance, Stix (2011) found that older people in Eastern European countries prefer more foreign currencies due to their experiences in past political and economic crises.

8.5.2 Difficulty in Changing People's Mindset

Even though the confidence in Riel was gradually built after the war, the fact that, since the early 1990s, Cambodians have become accustomed to earning, spending, and saving in US dollars makes it very difficult to change their

behavior and mindset toward Riel. The NBC has continuously promoted awareness of the importance of Riel on several occasions and through a variety of means, including "Riel Day," workshops, press releases, and social media dissemination. However, such measures are not sufficient without the participation of all stakeholders to instigate attachment and pride toward the national currency among people, especially from an early age.

8.5.3 Network Externality

Linked with the previous point, the fact that people have a habit of using US dollars in their daily life led to a network externality problem that lowered the transaction cost of using US dollars, causing people to prefer US dollars over Riel. Odajima, Aiba and Khou (2019) also found that network externalities are significantly correlated with household preferences for foreign currencies. To weaken network externality, market-based mechanisms seem to be insufficient. For instance, Vietnam has prohibited settlements of domestic transactions using foreign currency. Although not always fully enforced, this has led to a decrease in real and payments dollarization. Hence, regulations to push price tags and pay salary in Riel in the medium or long run are essential to weaken this network externality. Authorities may consider implementing these measures in a particular area or sector with a certain threshold, then gradually increasing the threshold and extending to other areas or sectors. Based on international experiences, this action would have a negligible effect on the public's trust and economic activities.

8.5.4 Lack of Demand-side Policies

People's confidence, mindset, and network externalities limit public demand for Riel, while the policies to promote the use of Riel so far are mainly based on the supply-side, which aims at providing more services in Riel, lowering the transaction costs of using Riel and supplying the amount of Riel in accordance with the market demand. To further boost the use of Riel, demand-side measures that directly affect consumer behavior are crucial to increase the potential demand for Riel. As already mentioned, this could be started by requiring all payments for public services to be made in Riel only; as a result, people would need more Riel for usage. Then, in the medium and long run, more measures are required such as supporting businesses that use local currency (e.g., lowering tax rates), requiring all price tags and at least a proportion of staff wages to be in Riel. Meanwhile, as discussed in Chapter 5, more efforts to formalize MSMEs and skill developments, including financial education and the use of accounting software, may also boost the demand for Riel among Cambodian firms. Indeed, many firms, particularly MSMEs, informally record their accounting in Riel. Without a standardized accounting system, it is challenging to access formal loans. Thus, if those firms are formalized and have formal accounting records in Riel, it may increase the demand for formal loans in Riel.

8.5.5 Limited Domestic Production

Demand for Riel is also hampered by limited domestic production. Cambodia relies considerably on imported products to sustain domestic consumption, so economic agents keep demanding a large volume of foreign currencies to import foreign products. With an increase in domestic produces, Riel will be in more demand in the trade of those products and this will help to reduce imports, so the demand for foreign currencies among traders will be reduced.

8.5.6 Limited Coordination Between Implementing Agencies

The promotion of Riel should be a task shouldered by everyone. For example, Aiba, Odajima and Khou (2018) have shown that some households are likely to borrow in the same currency in which they spend. Thus, financial dollarization may also be driven by US dollar transactions in the real sector. Even though financial dollarization is now reversed by the NBC's policy, real dollarization will weaken the effects of NBC's measures. This requires institutional coordination in the form of a technical inter-ministerial working group to monitor and strengthen the implementation of Riel promotion. The absence of a national strategy may account for this lack of coordination. Therefore, an immediate objective should be the development of a national framework to facilitate cooperation between all relevant institutions and to monitor the evolution of policy implementation, ensuring that all strategies are consistent with the ultimate objective of de-dollarizing the economy in the long term.

8.6 Conclusion

Dollarization in Cambodia did not result from a policy decision; rather, it emerged from a lack of public confidence in the national currency as a consequence of the country's nearly three decades-long civil war, coupled with political and economic instability during the transformation process. After a massive influx of US dollars through UNTAC operations and foreign aid in the early 1990s, the Cambodian people started to widely accept and use this hard currency, although the authorities never recognized it as legal tender. US dollars are just one part of monetary plurality in Cambodia because the neighboring countries' currencies, the Thai Baht and Vietnamese Dong, are also used along the borders—although their usage is limited compared with the Riel and the US dollar.

As described by Khou (2012), the monetary system with its multiple currencies contributed to the development of the Cambodian economy and banking system at a nascent stage of development by increasing the country's integration into the regional and global economy, improving fiscal discipline, lowering inflation, reducing foreign exchange risks, and attracting FDI. In this regard, dollarization did contribute to the restoration of economic stability from the era of macroeconomic imbalance. Nevertheless, with the growing

size of the economy, dollarization is a potential obstacle for further development, may cause risks, and may make the economy vulnerable to external conditions—especially to changes in monetary policy conditions in the United States, as proven by the global crisis caused by the COVID-19 pandemic. In fact, with a high level of dollarization, the country's central bank cannot use the monetary policy effectively, including a lack of effective policy rate that can drive the market rate, the limited control of money supply that could affect the level of price, its restricted role as the lender of last resort, and the difficulty it faces in providing credit to the government during economic crisis.

Over more than two decades, Cambodia has achieved macroeconomic and financial stability that has created a precondition for the implementation of de-dollarization policies, yet the country still has to overcome some structural challenges in terms of public confidence in its national currency, which was once completely destroyed. This needs to be followed by changing the people's mindset and network externalities in favor of the US dollar, which have strongly limited the effectiveness of implementing policies of de-dollarization. The current policies to promote local currency usage are appropriate and have widened the role of Riel in payments and, to a lesser extent, price quotations and savings. Going forward, the Royal Government and the National Bank of Cambodia must join together to promote the use of local currency more actively, and make sure that all promoting measures are consistent. Some administrative measures may be useful, if the situation warrants, to support the market-based instruments and to explicitly express the authorities' commitments regarding the promotion of the Riel, yet such measures must be clearly communicated to the public in advance.

Notes

1 See Calvo and Végh (1992) and Ize and Yeyati (2003), among others, for definitions of dollarization.
2 Between December 2017 and December 2022.

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