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FINANCIAL DEVELOPMENT AND INCLUSION ON SAVING BEHAVIOR IN ASEAN LDC: CASE OF CAMBODIA

Chea Serey
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ABSTRACT

In this paper, we explore the impacts of financial intermediation and financial inclusiveness on saving behavior of developing economy such as Cambodia using individual data from Global Findex database in 2017. We explore the impact of financial intermediation such as bank deposits, mobile banking, credit cards and debit cards on the saving behavior individuals in Cambodian economy. Particularly, we examine if increasing financial intermediation to vulnerable populations at the poorest segment of society will increase their saving behavior. The impact of financial inclusion in terms of a shift from informal to formal savings and investments through financial institutions will have a strong impact on resource mobilization for productive investment in the domestic economy. The results indicate that financial intermediation has positive impact on overall savings and also savings at banks and financial institutions. Particularly, we observed that individuals having a direct account with a bank and financial institution increases the probability of saving at the bank and financial institution. We also observed that financial innovation such as debit cards has positive impact on the probability of saving in the economy.

Key words: Financial Inclusion, Formal Savings, Financial Intermediation

JEL Classification: D14, D18, G21, G28, I25, L26

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FINANCIAL DEVELOPMENT AND INCLUSION ON SAVING BEHAVIOR IN ASEAN LDC: CASE OF CAMBODIA

1. Introduction

Financial development and financial inclusion are an integral part of economic development and growth in terms of mobilization of key economics resources for efficient economic activities (Schumpeter, 1911; King and Levine, 1993). The mobilization of resources through financial intermediation creates allocative efficiency (direct resources to most productive investment and activities) and also promotes efficiency (investment in new innovations and technologies). Recent studies also highlight a strong relationship between financial intermediation and economic growth (see, e.g. Rajan and Zingales, 1998; Beck et al., 2000; Levine et al., 2000; Khan, 2001; Demirgüç-Kunt et al., 2008).

Financial intermediation and particularly, financial inclusiveness are an important enabler for poverty reduction according to the United Nations, as an indication of economic and social inclusiveness not only in developing countries but also in developed countries. Access to financial services and mobilization of resources through savings and intermediation, deposit creation to productive investment, are critical dimensions of creating efficiency through financial institutions such as banks (Honohan, 2004; Beck, Demirgüç-Kunt, and Levine, 2007). Recent World Bank Global Findex Database reports that 1.7 billion of adult population worldwide remain unbanked; thus, putting them in a vulnerable position economically and socially. In this regard, providing the appropriate formal financial services that meet the needs of these people has become a key policy agenda for developing countries.

Financial inclusion, which is defined as access and usage of formal financial systems and services to all people in the economy including the vulnerable population, is critical to alleviate poverty and inclusive wealth creation in the economy. For example, the development of microfinance institutions and non-bank financial institutions in developing countries increases the financial participation of vulnerable populations in the economy by providing products and services catered to the underserved segment of the markets (Carmichael and Pomerleano, 2002; Michael, 2004). Sahay et al. (2015) find that a household's access to finance has a strong positive relationship with economic growth. Dabla et al. (2015) show using the general equilibrium model that lower costs of access to financial services, relaxing collateral requirement, and thereby increasing firms' access to credit would increase growth. Buera, Kaboski, and Shin (2012) find that microfinance has positive impacts on consumption and output.

The development of financial innovations such as new forms of payments such as credit cards and debit cards, and mobile technologies tend to increase the participation of vulnerable populations in the financial system and financial services. For example, rapid diffusion of mobile technologies in developing countries such as mobile payment facilitates financial services outreach to the unbanked in the previously underserved and unserved areas at an affordable cost.

In this paper, we explore the impacts of financial intermediation and financial inclusiveness on the saving behavior of developing economies such as Cambodia using individual data from Global Findex database in 2017. We explore the impact of financial intermediation such as bank deposits, mobile banking, credit cards and debit cards on the saving behavior of individuals in the Cambodian economy. We also examine if increasing financial intermediation to the poorest segment of society will increase their saving behavior. This study is the first study to examine the impact of financial intermediation and financial inclusion on the saving behavior of individuals in developing countries such as Cambodia.

The implications of financial inclusion are critical for developing economies in terms of mobilization of economic resources with regards to domestic savings for productive investment. In developing economies, most savings do not go through financial markets but use informal saving mechanisms (Aliber, 2015). The impact of financial inclusion in terms of a shift from informal to formal savings and investment through financial institutions will strongly impact resource mobilization for productive investment in the domestic economy. The increase in formal savings will have a positive impact on wealth creation for the vulnerable population in terms of access to more financial products. It will also reduce issues of asymmetric information with regards to bank borrowing by providing better visibility of the risk profile of the customer. The rise in formal savings through financial institutions also increases the effectiveness and impact of the monetary policies on the domestic economy (Mehrotra and Yetman, 2014); and fosters greater financial stability under certain conditions (Han and Melecky, 2013). In this paper we examine the impact of financial inclusion in terms of financial sector participation of the poor on their saving behavior in Cambodia. The Global Findex data allows us to examine the impact of financial inclusion on saving behavior as it captures the formal and informal financial sector participation of individuals in the economy. Our study is close to the observation by Beck, Demirgüç-Kunt, and Levine (2007) in terms of the impact of financial development on changes in the distribution of income, which disproportionately boosts incomes of the poorest quintile and reduces income inequality.

The paper is organized as follows. Section 2 discusses financial market development in Cambodia. In Section 3, we provide a comparative overview of financial development between Cambodia and Vietnam. Discussions on data and the empirical model employed are found in Section 4. The results of the aforementioned model are covered in Section 5. Section 6 concludes with policy implications.

2. Financial integration and Financial Inclusion: Case of Cambodia

After the Asian financial crisis in 1997, countries in the region took steps collaboratively to make the region more resilient and less prone to future possible negative shocks. Benefits from this deeper regional financial integration include improved productivity and living standards, better allocation of savings and investment across countries (particularly, from aging population countries to emerging countries), and promotion of financial inclusion initiatives (IMF, 2015, p.93). The initiatives comprise of the Chiang Mai Initiative Multilateralization, the Asian Bond Fund, the Asian Bond Market Initiative, ASEAN+3 and the Executives' Meeting of East Asia-Pacific Central Bankers.

Empirical evidence on the relationship between financial integration and financial inclusion is sparse. A recent cross-country study by the IMF in 2015 suggests that there is a positive association between cross-border banking (financial) integration and financial inclusion, but the association is only confirmed in middle- and high-income countries, but not in low-income ones (April 2015 *Regional Economic Outlook: Asia and Pacific).* The study uses cross-border banking integration—the size of cross-border bank assets and liabilities in percent of GDP—as a measure of financial integration and number of ATMs (Automated teller machine) per 100,000 adults as a measure of financial inclusion. It also adds other covariates with one-year lag, including indicators of quality of financial infrastructure, measures of financial depth (bank-to-credit-to-GDP ratio), banks' stability, banking concentration and competition (the Herfindahl index and Boone indicator), and level of education (a proxy for financial literacy). The sample spans the 2001-2012 period and covers 150 countries.

The analysis also highlights the importance of the possibility of the threshold effect of financial integration on financial inclusion since the coefficient of the interaction term between financial integration, financial development and financial literacy is positive and statistically significant. This implies that the relationship between financial integration and financial inclusion emerges only after financial sector development and financial literacy is above a certain level. The study continues further to show the positive effect of regional financial integration on financial inclusion in middle- and high-income Asia but did not include developing Asia due primarily to data availability.

Overall, levels of financial development and financial literacy of a country is critically important for promoting financial inclusion of that particular country when undertaking regional financial integration. This section looks at the relationship between financial integration and financial inclusion in Cambodia and Vietnam relative to other countries in East Asia and the Pacific.

2.2 Financial sector development and inclusion in Cambodia

Cambodia remains largely a dollarized economy, a system that came about as a result of historical circumstances rather than a conscious decision by the government. The use of US dollars in Cambodia had its genesis during the Khmer Rouge era (1975–1979) when all barter, private commercial activity, private ownership, means of exchange, and stores of value were prohibited and punishable by death. During this period, Cambodia was without a monetary system and without money.

In 1980, the riel was re-introduced but it did not receive wide acceptance by the public, which preferred other stores of value and means of payment such as the US dollar, gold, and even rice. GDP growth has averaged more than 6% per year from 2010 to 2012, driven largely by garment manufacturing, construction, agriculture, and tourism. The garment industry employs more than 335,000 people and accounts for more than 75% of Cambodia's total exports. Oil deposits were discovered in 2005 but remain unexploited. Investors are also looking to exploit mining opportunities that include deposits of bauxite, gold, iron, and gems. Lastly, the tourism industry remains a growth sector, with foreign visitor arrivals surpassing 2 million per year. The population lacks education and productive skills, particularly in the impoverished countryside, which also lacks basic infrastructure. More than half of the government budget comes from bilateral and multilateral donors, which have tied foreign aid to government passage of economic reform measures.

The country's economy was hit by the Global Financial Crisis (GFC), with its critically important garment industry suffering a 23% drop in exports to the US and Europe. GDP growth slumped to

0.1% in 2009 before recovering to more than 7% growth in 2011. It suffered no direct impact from the crisis in its financial sector and markets, however. The impact mostly came from the real sector. The lesson earnt from this GFC is the need to broaden its economic base both is term sector and products as well in term of export destination. As SEA nations came out relatively strong during the GFC, strengthening its regional trade could mitigate overreliance on US and EU markets. At the same time, Cambodia has experienced a phenomenal economic growth over the last two decades. With an average growth rate of 7.7% over the period of 1995-2015, it is one of the fastest growing economies in the world. This robust economic growth in the past two decades has transformed Cambodia into a lower-middle income country in 2016. With this shift to lower middle-income country, the government is focusing on social and economic structure changes and has also increased the budget for capital expenditure. Cambodia has been narrowing current account deficit to 8.1% of GDP in 2017 which was financed by continued strong FDI inflows, estimated to have reached USD 2.8 billion (or 13% of GDP) in 2017.

Financial inclusion has become instrumental to addressing the country's economic growth, reduce inequality and decrease overall national poverty rates. Access to finance has become as essential policy tool for national and global policy makers to enhance economic growth and stability. With population being excluded from access to finance, there is a potential loss of deposits or savings, investible funds capable of enhancing credit creation and capital accumulation, which results in loss of capacity of the economy to generate socio-economic development. Elimination of blockages to financial inclusion has significant direct impacts on productivity and GDP growth through smarter allocation of resources and more efficient financial contracting; resulting in stronger entrepreneurial activities and new business start-ups that increase aggregate output.

Three indicators of financial inclusion, namely adults' (aged 15+) having an account at formal financial institutions [Account], having savings at formal financial institutions [Saving] and taking loan from financial institutions [Borrowing], acquired from the World Bank's Global Findex database in 2017 are used for the case study of Cambodia. Figure 1 below shows that Cambodia's rates of having account and saving at financial institution are considerably lower than the average rates for ASEAN, East Asia and the Pacific, lower income and lower middle-income economies. Nevertheless, the percentage of adults taking out loans from financial institutions in Cambodia is higher than the average rates of the same indicator in the aforementioned country groups.

The key barrier to financial inclusion has been the low level of awareness and financial literacy in the country. The ability to engage with information on financial services is an important precursor to effective usage of financial services. The majority of the population (75%) earn less than USD 245 per month, implying low disposable income for financial services costs. Despite Micro-Development Institutes (MDIs) and Micro-Finance Institutes (MFIs) playing a significant role in expanding the reach and promoting usage of financial products, there are still gaps in terms of access to more rural areas (at the community and village level) and restricted practices followed by these institutions in terms of the products offered. In order to encourage usage, financial products need to be further customized to address the target segment's socio-economic status and needs. This gap has led to the population to use informal channels or otherwise remain unserved.

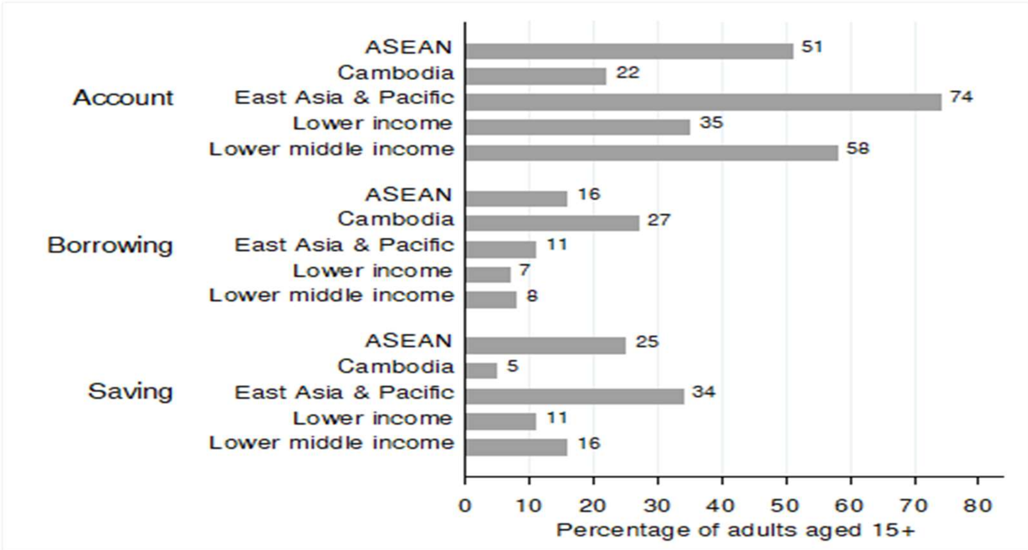


Figure 1: Financial inclusion in Cambodia in 2017

Source: World Bank's Global Findex data, 2017

The national financial inclusion strategy was adopted in 2019 and used as a roadmap to consolidate efforts currently being carried out by the government, development partners and private sector players by consolidating efforts and focusing on areas that need immediate intervention. The National Bank of Cambodia, Ministry of Economy and Finance, Ministry of Posts and Telecommunications, and Ministry of Interior, as leading institutions, will co-ordinate the action plan implementation and ensure cooperation among stakeholders to achieve the goals of financial inclusion, which is to increase access to quality and affordable formal financial services, reduce the financial exclusion of women by 50% (from 27% to 13%), and diversify usage of formal financial services from 59% to 70% by 2025 as well as improve household welfare and support economic growth. Various priority activities have been identified to achieve the goals, including (1) encourage savings in formal financial institutions, (2) promote innovative credit products for MSMEs, (3) enable the expansion of payment system capabilities, (4) expanse broader insurance products, (5) strengthen the capacity of the financial sector regulators and (6) increase consumer empowerment and financial sector transparency.

Interestingly, despite low financial inclusion, Cambodia's financial sector is very open and integrated in the region. We use the Chinn-Ito index, a measure of the extent of openness in capital account transactions, and the percentage of consolidated foreign claims of Bank of International Settlement reporting banks to GDP, a measure of financial integration, to present the status of financial openness in Cambodia relative to the ASEAN average as shown in Figure 2 below. While the latter measure is quite straightforward, the former comprises a set of capital controls policies and regulations based on information in the IMF's Annual Report of Exchange Arrangements and Exchange Restrictions (AREAER). The Chinn-Ito index of capital account openness is the first component of the combined dummy variables of four major categories on the restrictions of external accounts, namely the presence of multiple exchange rates; restriction on current account transactions; restriction on capital account transaction; and the requirement of the surrender of export proceeds.

As indicated in Panel A in Figure 2 below, Cambodia's capital account is extremely open with the maximum capital account openness index of 1.0, twice as high as that of the ASEAN average. Among ASEAN member states, only Singapore exhibited similar score of 1.0, while the index for Vietnam and Thailand were only 0.4 and 0.2, respectively. There are a number of incentives set out in the Cambodian financial legal framework that makes Cambodia quite unique relative to other countries in the region. The incentives include: no restrictions on foreign ownership, no local joint venture requirements, liberalization of interest rate, free repatriation of benefits, and no exchange control (Youdy, 2019). Latest data from the National Bank of Cambodia shows that share of foreign-owned bank in Cambodian banking sector in 2018 was 50.1%, which was notably higher than shares in other countries in the region (NBC, 2018). Moreover, there is only one state-owned specialized bank, which is known as Rural Development Bank (RDB), and it only has a small share in a commercial bank in the domestic banking system, suggesting a marginal involvement of the state in the financial system. On the financial integration side, Cambodia's cross-border banking integration is also relatively high as it is close to the ASEAN average and lags behind only Singapore (143%), Malaysia (50%) and Thailand (34%) (IMF, 2019).

Panel A: Financial openness and development in 2017

Panel B: Cross-border banking integration in 2016

Figure 2: Financial openness, development and integration in Cambodia and ASEAN

Source: Openness is from Chinn-Ito Index, 2019; financial sector development index and financial integration are from IMF's International Financial Statistics, 2019. Note: Openness index and financial development index are normalized to be between zero and one. Financial integration (cross-border banking integration) is measured by percentage of consolidated foreign claims of Bank of International Settlement reporting banks to GDP.

Nevertheless, the level of financial development in Cambodia remains relatively low which is twice as low as the ASEAN average as shown in Panel A in Figure 3 below. The level is also substantially lower than level in its neighboring peers, such as Vietnam (0.29) and Thailand (0.70). It is important to note that the financial development index is constructed from indexes of financial institution and financial market, each of which captures three financial aspects, namely financial depth, financial access and financial efficiency (IMF, 2019).

This in effect is very interesting because although Cambodia shows extremely high index of capital account openness and relatively high cross-border banking integration, its rate of financial inclusion is considerably lower than ASEAN average of 51% and its neighboring peers, e.g. Vietnam (31%).

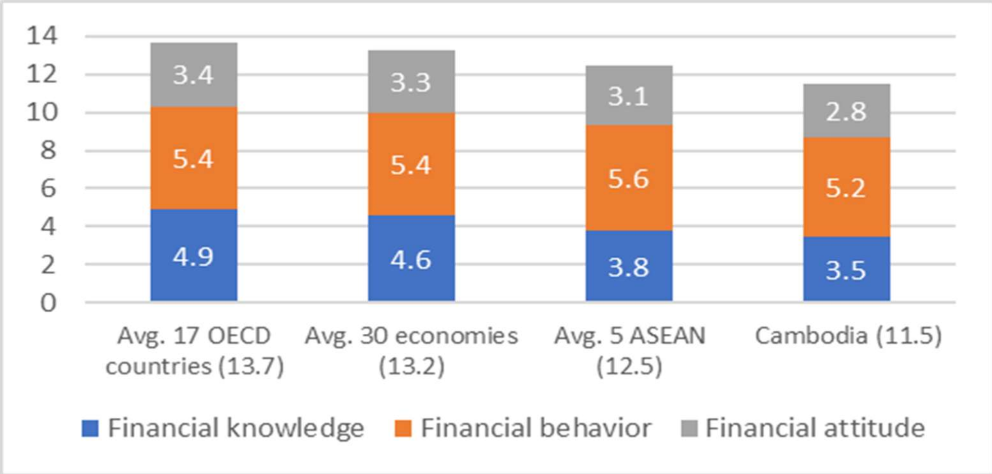


Figure 3: Financial literacy in Cambodia and other selected country groups in 2015

Source: Adapted from OECD (2018, p.13).
Note: The maximum score for the financial literacy is 21 (higher, better).

2.2 Financial development and financial depth in Cambodia and Vietnam

This section presents the evolution of financial sector development and financial institution depth in Cambodia and Vietnam during the last two decades. We use the Financial Development dataset prepared by the IMF for 176 advanced, emerging and low-income economies from the World Bank Global Financial Development Database and World Bank FinStats, IMF's Financial Access Survey, Dealogic corporate debt database, and Bank for International Settlement (BIS) debt securities database. The financial development index contains two broad aspects of the financial system, namely financial institutions and financial markets, each of which covers their respective depth, access and efficiency.

Figure 4 shows the evolution of financial sector development in selected ASEAN countries during the last two decades. Panel A shows that among the selected countries, Thailand and Vietnam started at a high base in the mid-1990s and continued to gradually become more developed until recent years, while Cambodia, Lao PDR and Myanmar started at very low bases and showed slow advancement in their financial system during the last two decades. Interestingly, Thailand exhibited a much faster pace of development than other countries and is considerably more advanced than other countries in the sample, which could be attributed to the size and sophistication of Thailand's financial market relative to those in Viet Nam, Myanmar, Lao PDR and Cambodia. The level of financial development in Viet Nam dropped quite substantially a few years after the global financial crisis, however, it improved quite remarkably in the last couple of years. Still, the level of development in Vietnam remains considerably higher than that in Cambodia despite its continued improvement in the last 6 years.

A similar pattern is also observed for the index of financial institution depth as indicated in Panel B in Figure 4. Financial institution depth for Cambodia rose steeply during the last two years suggesting there is room for Cambodia to catch up to its neighboring peer Vietnam.

Panel A: Index of financial sector development **Panel B: Index of financial institution depth**

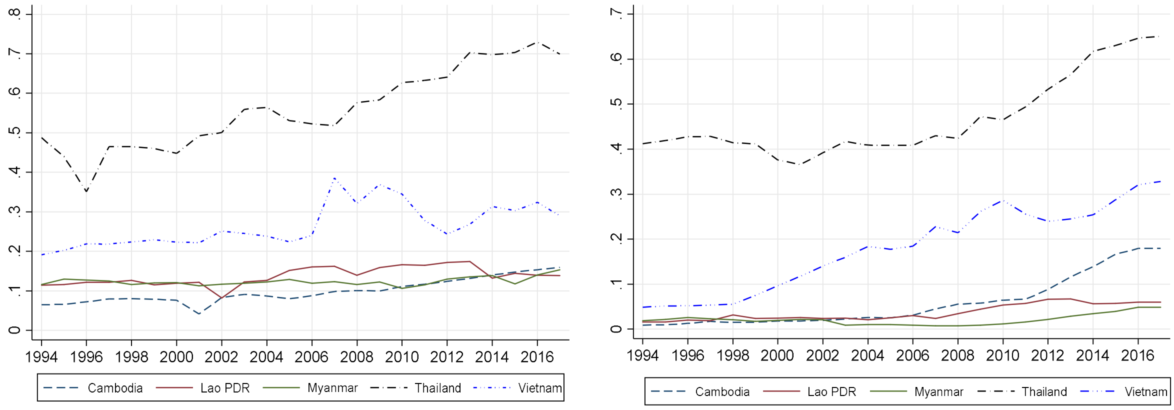
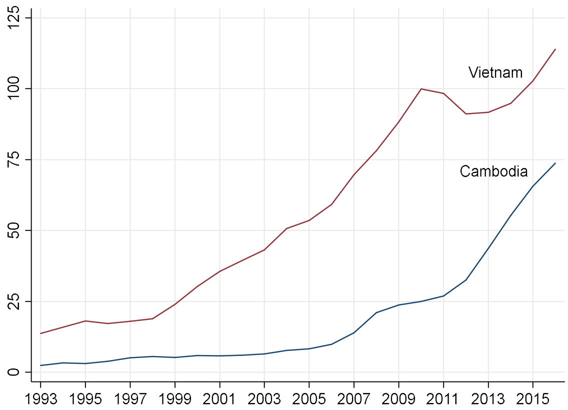


Figure 4: Index of financial sector development & financial institution depth in selected ASEAN countries

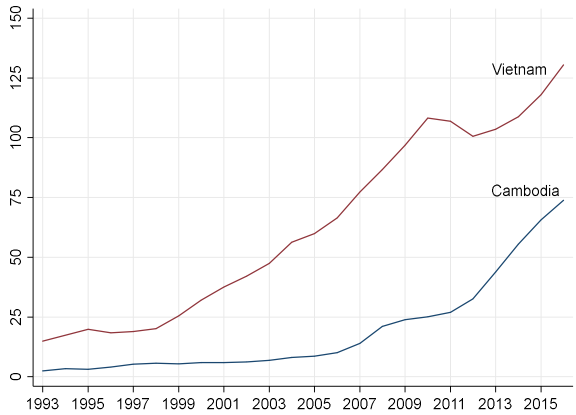
Source: IMF's Financial Development Index database 2019

We further examine other financial depth indicators for Cambodia relative to those of Vietnam to see whether there are any indicators exhibiting a relatively unique pattern. Among the six depth indicators shown in Figure 5, the share of financial system deposit to GDP shows a completely different pattern from others. Unlike other depth indicators which put Cambodia in a considerably lower position than the position in Vietnam, the share of financial system deposits to GDP for Cambodia has been substantially higher than that for Vietnam during the last half of decade. This is explained by the fact that interbank deposits in higher in Cambodia than in Vietnam, an indication of a lack of investments or intermediation of the bank's assets. This clearly shows that considerable effort and resources are needed for Cambodia catch up with its neighboring peer Vietnam.

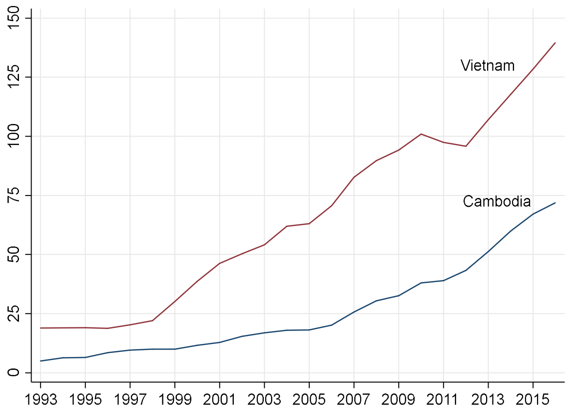
Panel A: Private credit by deposit money banks to GDP



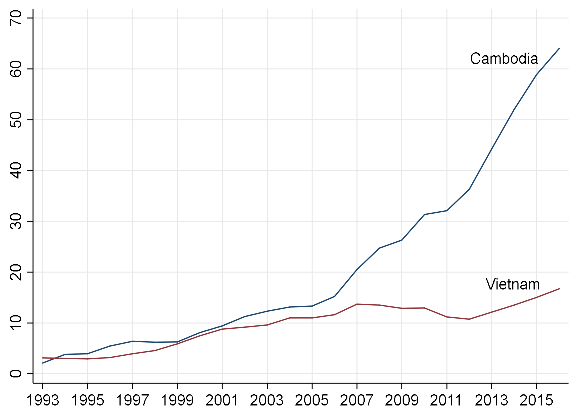
Panel B: Deposit money banks' asset to GDP (%)



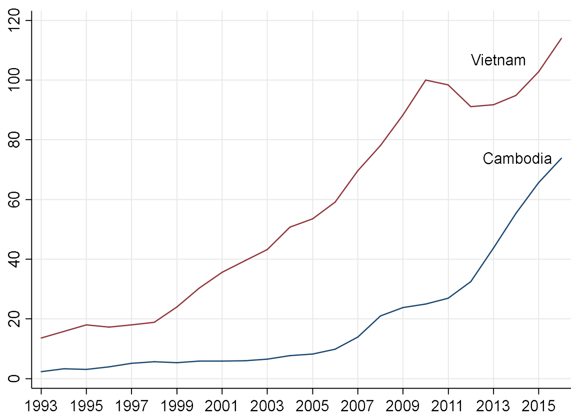
Panel C: Liquid liabilities to GDP (%)



Panel D: Financial system deposit to GDP (%)



Panel E: Private credit by deposit banks & other financial institutions to GDP (%)



Panel F: Domestic credit to private sector to GDP (%)

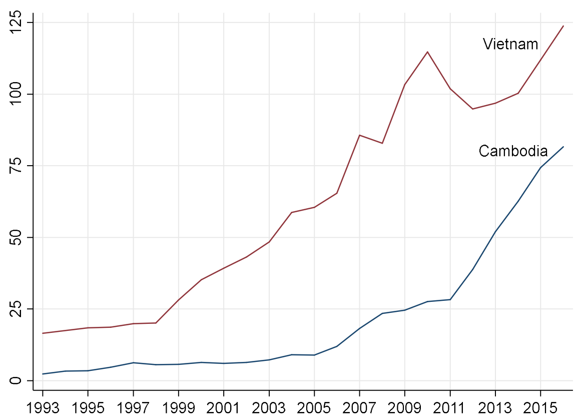


Figure 5: Financial depth in Cambodia and Vietnam, 1993-2016

Source: IMF's Global Financial Development database 2018

Figure 6 below further confirms the supply-side measures of inclusion or access above; however, we observe an interesting pattern which deserves some discussion. As indicated in the earlier section, the level of financial inclusion—measured by whether an adult has an account at a formal financial institution, has a saving account at financial institution, and takes a loan from a financial institution—for Vietnam was significantly higher than that for Cambodia in 2014 and 2017. And Panel B in Figure 13 below tends to confirm this inclusion pattern since the number of ATMs per 100,000 adults in Vietnam has been extremely higher than that in Cambodia during the last decade. By contrast, Panel A in Figure 11 below paints a contradicting picture as the number of bank branches per 100,000 adults in Cambodia was considerably larger than that in Vietnam during the last few years. This may suggest that the constraints could be from the demand side. Those constraints could be distance from adult's community to the bank branch, education level, income, document, trust, religious reason, the need for financial services, and others which have been shown in the earlier section. The higher number of branches could also imply the higher cost of financial services because of a higher cost of operation due to the brick-and-mortar bank branches. This indicates that the use of technology to deliver services to remote area could reduce cost, along with basic infrastructure such as electricity and internet connection.

Panel A: Number of branches per 100,000 adults | **Panel B: Number of ATMs per 100,000 adults**

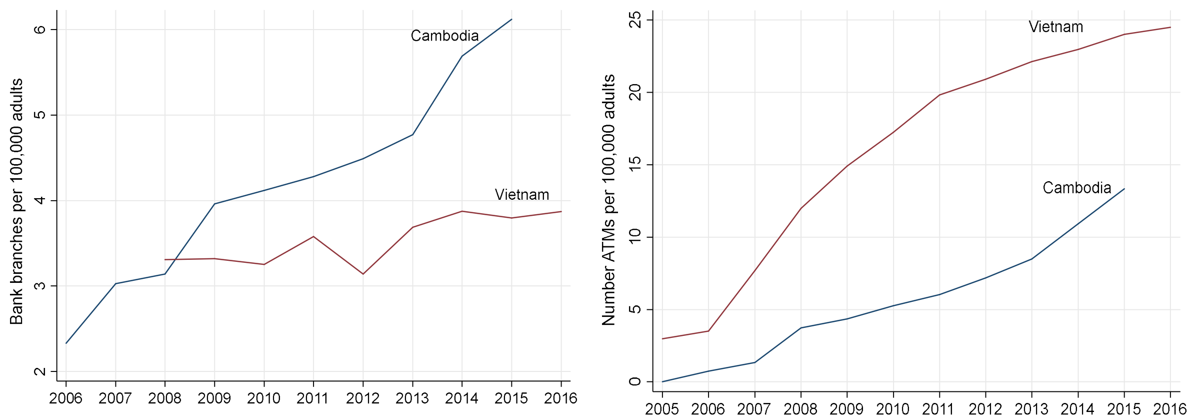


Figure 6: Financial institution access in Cambodia and Vietnam

Source: Global Financial Development Database 2018

2.3 Financial literacy in Cambodia and Vietnam

Financial products are sophisticated in nature and financial management isn't always obvious for most people especially low educated ones. Adding to this complication is the technology that is embedded in the delivery of those services. As such it is critically important that consumers are well informed of the sophistication, as well as the risk borne by the financial products and services. Therefore, the lack of financial education may put consumers at much higher risk than ever and may even in some ways discourage individuals from using financial products. Using a cross-country dataset of 143 countries, Grohmann et al. (2018) show a positive association between financial literacy and financial inclusion, which is also in support of the results shown in Lusardi and Mitchell (2014). It is also worth noting that making financial services inclusive is imperative, but rapidly bringing individuals into the formal financial system when a significant proportion of the adult population lacks proper and sufficient financial education could be problematic. More importantly, financial education should be regarded as a complement, but not a substitute to appropriate consumer protection, financial regulation and supervision (OECD, 2018, p.8).

OECD (2018) uses cross-country comparable survey data collected by the International Network on Financial Education (OECD/INFE) and shows that financial literacy, measured by summing scores of financial knowledge, financial behavior and financial attitude[1], among selected five ASEAN countries (i.e. Cambodia, Vietnam, Malaysia, Thailand and Indonesia) in 2015 is relatively lower than the average score of 17 OECD countries, as well as the average score of all 30 survey participants (see Figure 7 below). Cambodia exhibited the lowest financial literacy score, but not considerably far below that of Vietnam. Moreover, scores for the three components of financial literacy in Cambodia are lower than those in Vietnam and other selected ASEAN member states. This clearly suggests that Cambodia and Vietnam urgently need to promote financial education among adult population in their respective countries so as to effectively promote their financial inclusion, while Cambodia has to do much more and inject more resources in its financial education interventions.

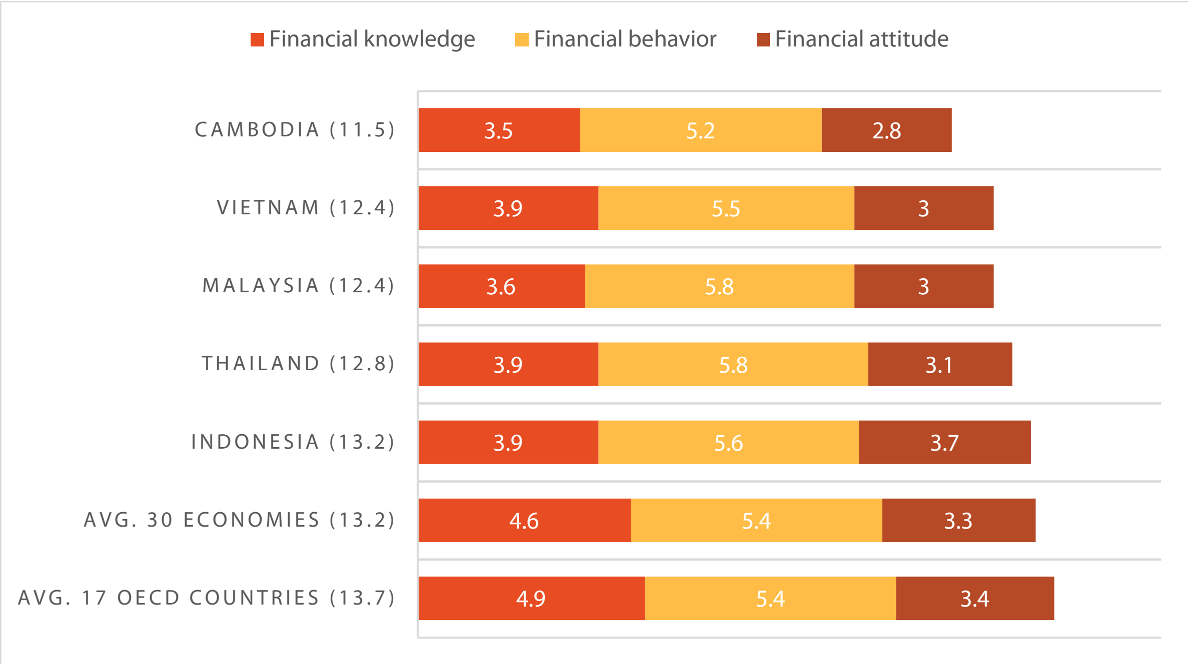


Figure 7: Financial literacy in five ASEAN countries, 2015

Source: Adapted from OECD (2018, p.13)
Note: The maximum score for the financial literacy is 21 (higher, better).

Promoting financial literacy could in some ways be conducted indirectly through improving education, income and employment levels, which was found in Morgan and Trinh (2017) to be significant drivers of financial literacy in Cambodia and Vietnam. A positive association between financial literacy and level of education of adult population is also confirmed by OECD (2018) for 17 OECD economies, 5 selected ASEAN economies or 30 OECD/INFE participating countries. Figure 8 below shows a clear pattern of positive association between education levels and financial inclusion

[1] Financial knowledge is measured based on questions related to time value of money, simple and compound interest rate, risk and return, inflation and diversification, while financial behavior is based on questions related to budgeting, researching before purchasing financial products, paying bills on time and saving/borrowing to make ends meet. For the last measure, financial attitude is measured based on questions related to preferences towards the long term.

measures, i.e., whether adults have an account at formal financial institutions, in both Cambodia and Vietnam.

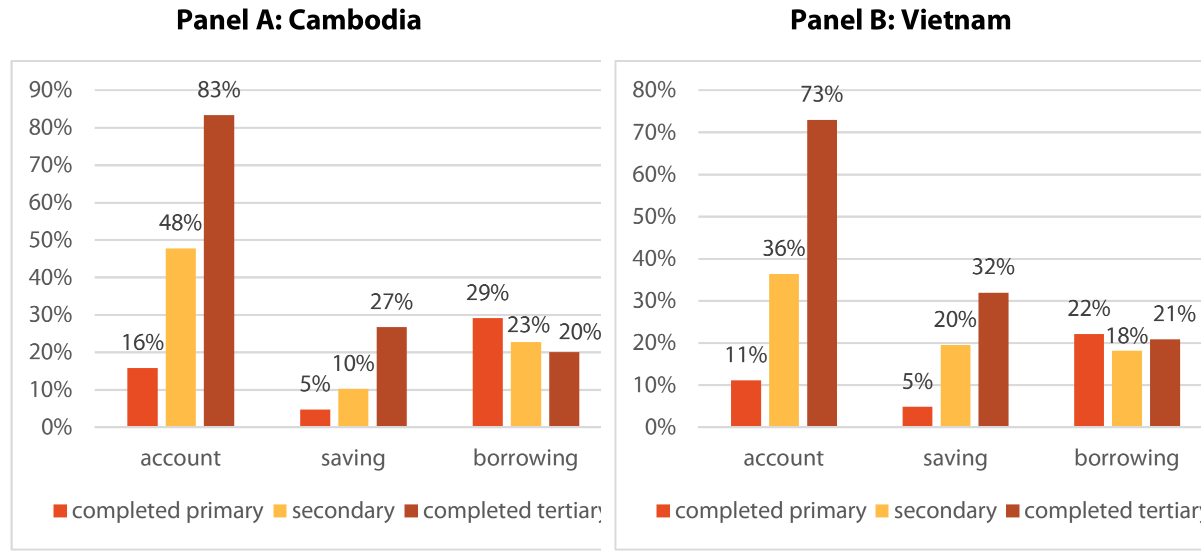


Figure 8: Financial inclusion by education level of adults in Cambodia and Vietnam, 2017

Source: Author's calculation from World Bank's Global Findex dataset 2017

3.Empirical Framework: Financial Inclusion, Saving and Behaviors in Cambodia

In this section, we provide the empirical framework for the impact of financial inclusion on the saving and borrowing behavior in Cambodia using the individual data from World Bank Global Findex data in 2017. The summary of the data used from Global Findex data is given at Table 1 below.

The World Bank's Global Findex indicators measure the use of financial services, which is distinct from access to financial services. Access most often refers to the supply of services, while "use" is determined by demand as well as supply. "Use" refers to the levels and patterns of use of different financial services among different groups, such as poor people, youth, and women. The World Bank's Global Findex provides several indicators of financial inclusion such as measures on how adults save, borrow, make payments, and manage risk. The indicators are constructed with survey data from interviews with more than 150,000 nationally representative and randomly selected adults age 15 and above in those 148 economies in the 2011, 2014, and 2017.

The Global Findex has three set of important indicators. The first set of indicators focuses on formal accounts; the mechanics of the use of these accounts (frequency of use, mode of access); the purpose of these accounts (personal or business, receipt of payments from work, government, or family). The second set of indicators focuses on savings behavior: the use of accounts, as people often save at formal financial institutions. The third set focuses on sources of borrowing (formal and informal); purposes of borrowing (mortgage, emergency or health purposes, and the like); and use of credit cards. The fourth focuses on use of insurance products for health care and agriculture.

Variables	Obs	Remarks	
Account	1600	Individuals having account including themselves and with other members at any financial institutions	
Account_Fin	1600	Individuals having account with a bank or any financial institution	Resource mobilization variable through financial institution
Account_Mob	1600	Individuals having a mobile account with a bank or any financial institution	Formal saving and technology-based mobilization variable
Saved	1600	Individuals reported to have saved for past 12 months (including formal and informal)	
Saved_Fin	1600	Individuals reported to have saved for past 12 months at bank or any financial institution	Formal saving and resource mobilization variable through financial institution
CreditCard	1600	Individuals reported to having a credit card	Financial innovation
DebitCard	1600	Individuals reported to having a debit card	Financial innovation
Wage_Account	1600	Individuals reported to have received wages through account at bank or financial institution	Financial innovation
Gender	1600	Dummy variable to capture gender (male =1, female = 0)	
Employment	1600	Individuals reported to have been employed for past 12 months	
Age	1600	Age of reported individual	
Education	1600	Education attainment of reported individual: completed primary or less; secondary; completed tertiary or more	
Income	1600	Reported individual in income quintile: lowest-quintile (poor), second-quintile, middle-quintile, fourth-quintile, highest-quintile (richest)	

Table 1: List of Variables from Global Findex Data for Cambodia

Source: Global Findex Database

The empirical model to explore the impact of financial intermediation and financial inclusiveness on savings behaviors is implemented using discrete-choice econometric specification model of probit estimation as given below.

$$Y_i = \alpha_0 + \alpha_1 Gender_i + \alpha_2 Age_i + \alpha_3 Education_i + \alpha_4 Employment_i + \alpha_5 Income_i + \alpha_6 Account_i + \alpha_7 Account\_Fin_i + \alpha_8 Account\_Mob_i + \alpha_8 CreditCard_i + \alpha_9 DebitCard_i + \alpha_{10} Wage\_Account_i + \varepsilon_i \quad (1)$$

Y_i is the dependent variable of capturing the saving and borrowing behaviors of individuals in the economy taking a value of 1 for individuals saving and 0 otherwise. The empirical model includes individual characteristics of gender, age, employment status and education status. We also control for the income level of individuals in terms of income quintiles of lowest-quintile (poor), second-quintile, middle-quintile, fourth-quintile, and high-quintile (richest).

We also included the financial intermediation variable in terms of account at financial institution or bank ($Account\_Fin_i$), which is the key variable to capture the formal mobilization of resources in the economy through financial institutions. We also included financial innovation variables of credit card ($CreditCard_i$), debit card ($Debitcard_i$), mobile account ($Account\_Mob_i$), and wage account with financial institutions ($Wage\_Account_i$).

The baseline regression results for saving and saving at financial institutions or banks are given at Tables 2 and 3 below. The results of the overall saving behavior that includes formal and informal is given at Table 2. Gender has a positive impact on savings, reflecting that males save more than females in the Cambodian economy. We also observe that older individuals experience a lower probability to save compared to younger ones. Employment seems to be critical for savings and employed individuals tend to save more as indicated by the positive coefficient. We do observe a positive impact of education on overall savings in Cambodia, but it is not statistically significant.

The results are very robust and statistically significant in terms of the impact of different income quintiles. The coefficient for the lower incomes quintiles is smaller as compared to higher incomes quintiles. This indicates that poor individuals have a lower probability of savings as compared to higher income individuals.

We also explore the impact of financial intermediation (depository creation) of having an account and financial innovation of mobile banking, debit card and credit card on the overall saving behavior of individuals in our sample. The results indicate that financial intermediation such as having a bank account or being associated with another member with account has positive impact on savings in the economy (columns 1 and 2). However, if the individual has a direct account with a bank or financial institution ($Account\_Fin_i$), it has a higher impact on savings (column 2). We also observe positive impact of financial innovation such as mobile bank account ($Account\_Mob_i$) on overall savings in the economy, however, it much lower as compared to direct account with a bank or financial institution.

We also explore financial innovations such as debit cards, credit cards and wages paid through bank account on the saving behaviors of individuals (columns 4, 5, and 6). Debit cards have a positive impact on savings in the economy and the impact is statistically significant. We also observe a positive impact of credit card and wages paid through bank account, but the coefficients are not statistically significant.

	(1)	(2)	(3)	(4)	(5)	(6)
$Gender_i$	0.186** (0.070)	0.186** (0.070)	0.177** (0.070)	0.182** (0.070)	0.188** (0.070)	0.181** (0.070)
Age_i	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)	-0.010*** (0.002)	-0.009*** (0.002)
$Education_i$	0.129 (0.092)	0.123 (0.092)	0.207** (0.090)	0.124 (0.096)	0.159* (0.094)	0.138 (0.094)
$Employment_i$	0.294*** (0.071)	0.294*** (0.071)	0.315*** (0.315)	0.308*** (0.071)	0.302*** (0.071)	0.311*** (0.071)
$poor_i$	4.018*** (0.234)	4.026*** (0.234)	4.064*** (0.235)	4.058*** (0.234)	4.050*** (0.234)	4.056*** (0.233)
$Second\_Quintile_i$	4.207*** (0.234)	4.224*** (0.236)	4.268*** (0.235)	4.267*** (0.235)	4.263*** (0.234)	4.265*** (0.234)
$Middle\_Quintile_i$	4.430*** (0.235)	4.436*** (0.235)	4.497*** (0.236)	4.485*** (0.235)	4.483*** (0.235)	4.486*** (0.235)
$Fourth\_Quintile_i$	4.541*** (0.234)	4.551*** (0.235)	4.608*** (0.235)	4.599*** (0.234)	4.602*** (0.234)	4.597*** (0.234)
$Richest_i$	4.528*** (0.235)	4.540*** (0.236)	4.640*** (0.235)	4.611*** (0.235)	4.619*** (0.234)	4.612*** (0.234)
$Account_i$	0.362** (0.081)	-	-	-	-	-
$Account\_Fin_i$	-	0.373*** (0.089)	-	-	-	-
$Account\_Mob_i$	-	-	0.233* (0.141)	-	-	-
$CreditCard_i$	-	-	-	-	0.523 (0.390)	-
$DebitCard_i$	-	-	-	0.257* (0.142)	-	0.301** (0.133)
$Wage\_Account_i$		-	-	0.167 (0.205)	0.294 (0.190)	-
$Constant$	-4.435*** (0.282)	-4.437*** (0.283)	-4.557*** (0.283)	-4.453*** (0.285)	-4.474*** (0.284)	-4.469*** (0.283)
Observations	1600	1600	1600	1600	1600	1600
R-Square	0.074	0.072	0.066	0.067	0.068	0.067
Likelihood ratio	-1027.14	-1028.11	-1035.68	-1034.22	-1034.83	-1034.56

Table 2: Regression Results for Overall Saving ($Saved_i$) for Cambodia

*Statistical Significance: *-10%, **-5%, ***- 1%*

We also explore the impact of financial intermediation and financial innovation on saving behavior at the banks and financial institutions, which is critical to formalize savings and mobilize key resources to productive investments. The results are given at Table 3. The savings behavior at financial institutions and banks seems to be different from the overall saving behavior of individuals in Cambodia. The key individual characteristics of gender, age and education do not have statistically significant impacts on saving at banks and financial institutions. Gender and education are expected signs as with the overall saving behavior at Table 2 and not statistically significant. The age variable is positive indicating that older individuals tend to save at banks and financial institutions, but it is not robust or statistically significant. We also observe employment status has higher probability on savings at the banks and financial institutions, however it is not robust and statistically significant.

	(1)	(2)	(3)	(4)	(5)	(6)
$Gender_i$	0.131 (0.132)	0.143 (0.133)	0.030 (0.113)	0.036 (0.117)	0.052 (0.114)	0.037 (0.117)
Age_i	0.002 (0.038)	0.001 (0.003)	0.001 (0.003)	-0.001 (0.003)	-0.004 (0.003)	-0.001 (0.003)
$Education_i$	0.090 (0.116)	0.025 (0.119)	0.388** (0.112)	0.005 (0.140)	0.227* (0.127)	0.019 (0.134)
$Employment_i$	0.129 (0.151)	0.099 (0.153)	0.239* (0.127)	0.202 (0.137)	0.196 (0.129)	0.205 (0.136)
$poor_i$	2.002*** (0.329)	1.969*** (0.324)	2.315*** (0.299)	2.604*** (0.285)	2.333*** (0.299)	2.606*** (0.285)
$Second\_Quintile_i$	2.237*** (0.281)	2.248*** (0.281)	2.655*** (0.272)	3.001*** (0.258)	2.698*** (0.271)	3.002*** (0.257)
$Middle\_Quintile_i$	2.375*** (0.278)	2.316*** (0.283)	2.787*** (0.269)	3.104*** (0.258)	2.798*** (0.267)	3.108*** (0.258)
$Fourth\_Quintile_i$	2.493*** (0.270)	2.445*** (0.269)	2.898*** (0.260)	3.176*** (0.246)	2.933*** (0.258)	3.176*** (0.245)
$Richest_i$	2.466*** (0.288)	2.396*** (0.288)	3.037*** (0.259)	3.235*** (0.250)	3.028*** (0.258)	3.240*** (0.249)
$Account_i$	1.486*** (0.138)	-	-	-	-	-
$Account\_Fin_i$	-	1.581*** (0.137)	-	-	-	-
$Account\_Mob_i$	-	-	0.389** (0.191)	-	-	-
$CreditCard_i$	-	-	-	-	0.572 (0.420)	-
$DebitCard_i$	-	-	-	1.163** (0.172)	-	1.185*** (0.159)
$Wage\_Account_i$		-	-	0.090 (0.250)	0.674** (0.216)	-
$Constant$	-5.026*** (0.383)	-4.798*** (0.387)	-5.103*** (0.349)	-5.034*** (0.365)	-4.878*** (0.363)	-5.055*** (0.359)
Observations	1600	1600	1600	1600	1600	1600
R-Square	0.273	0.297	0.071	0.151	0.082	0.158
Likelihood ratio	-245.42	-237.38	-313.68	-285.51	-309.91	-285.59

Table 3: Regression Results for Saving at Bank or Financial Institution ($Saved\_Fin_i$) for Cambodia

*Statistical Significance: *-10%, **-5%, ***- 1%*

The saving behavior at banks and financial institutions in Cambodia is driven by the level and distribution of income in the Cambodian economy. The results indicate that poorer segments of the economy tend to experience a lower probability to save at banks and financial institutions compared to higher income groups. In our results, all income quintiles have positive impact on saving at the banks and financial institutions, however the probability is smaller (lower coefficient) as compared to overall savings results given at Table 2. This indicates that there is a higher probability for the individuals to undertake informal savings (such as saving clubs, etc.) compared to formal savings. This is likely to be higher for the poorer segment of the economy.

The impact of financial intermediation and financial innovation are positive and statistically significant with regards to saving at banks and financial institutions. Firstly, the higher income quintiles have a higher probability of saving in a bank and financial institutions as compared to lower income quintiles. Both *Account*$_i$ and *Account_Fin*$_i$ are positive and statistically significant, thereby showing higher coefficients for higher income quintiles. Secondly, even controlling for income quintiles, we observe a positive probability of saving in a bank and financial institution for both *Account*$_i$ and *Account_Fin*$_i$ indicating that financial intermediation policies have a positive impact on financial inclusion in the financial market in Cambodia. Thirdly, as in overall savings, the probability of saving at a bank and financial institutions are higher for individuals that have a direct account with a bank or financial institution (*Account_Fin*$_i$) compared to those associated with a member with an account at a bank or financial institution. This indicates that policies to increase individual bank accounts has greater impact on saving mobilization in the domestic economy. Fourthly, financial innovation such as debit card has positive impact on savings in a bank and financial institutions, however, having a wage payment account and credit card has not statistically significant impact on saving behavior at the bank and financial institution.

The results at Tables 2 and 3 only indicates the level and degree of saving behavior from financial intermediation and innovation. It does not indicate the level of financial inclusion in terms of impact on the formal saving behavior of individuals at lower income segment. To capture the impact of financial inclusion on individual saving behavior, we interact the lower income quintiles of lowest, second and middle with financial intermediation variables of *Account*$_i$ and *Account_Fin*$_i$, and also financial innovation variable of mobile banking, *Account_Mob*$_i$. The results are given at Table 4.

The key variables capturing the individual characteristics are similar to the results at Tables 2 and 3. However, the education variable is positive and statistically significant for the regions with saving at banks and financial institutions. The interactive terms indicate that higher income has a higher probability of overall saving behavior and also saving at the bank and financial institutions. We also observe that financial intermediation increases the overall saving behavior of the poor (lowest and second income quintiles), indicating the positive impact of financial market policies and financial inclusion on poorer segments of the population. The impact of direct accounts at banks and financial institutions (*Account_Fin*$_i$) on the probability of saving is higher for poor and second income quintiles compared to the impact of *Account*$_i$. We observed this result in both the overall saving and saving at banks and financial institutions regressions. This suggests that policies should be directed in increasing individual accounts in banks to bring direct impact on financial intermediation and saving mobilization in the economy. We also observed that financial innovation of mobile banking has a positive but not statistically significant impact on the saving behavior of poor and second-income quintiles. The impact of mobile banking is positive for higher income groups in the middle-income quintiles.

Policy Conclusion

In this paper, we explored the impacts of financial intermediation and financial inclusiveness on the saving behavior of developing economies such as Cambodia using individual data from Global Findex database in 2017. The results indicate that financial intermediation has a positive impact on overall saving behavior and also saving at banks and financial institutions. Particularly, we observed that individuals having a direct account with a bank and financial institution increases the probability of saving at the bank and financial institution. We also observed that financial innovation such as debit cards have positive impacts on the probability of saving in the economy. However, we do not observe any positive impact from mobile banking, credit cards and wage payments though bank account on saving behavior in the economy.

	Saving ($Saved_i$)			*Saving Financial Institute and Bank* ($Saved\_Fin_i$)		
	(1)	(2)	(3)	(4)	(5)	(6)
$Gender_i$	0.193** (0.070)	0.190** (0.070)	0.183** (0.070)	0.119 (0.121)	0.120 (0.121)	0.042 (0.113)
Age_i	-0.010*** (0.002)	-0.010*** (0.002)	-0.009*** (0.002)	-0.011 (0.003)	-0.010 (0.003)	0.001 (0.003)
$Education_i$	0.179** (0.090)	0.177* (0.091)	0.211** (0.090)	0.316** (0.113)	0.298* (0.114)	0.387** (0.119)
$Employment_i$	0.295*** (0.071)	0.295*** (0.071)	0.315*** (0.071)	0.178 (0.139)	0.154 (0.139)	0.232* (0.128)
$poor_i$	4.027*** (0.237)	4.034*** (0.235)	4.075*** (0.235)	2.061*** (0.407)	1.948*** (0.409)	2.322*** (0.128)
$Second\_Quintile_i$	4.192*** (0.238)	4.229*** (0.235)	4.262*** (0.236)	2.085*** (0.391)	2.198*** (0.331)	2.676*** (0.275)
$Middle\_Quintile_i$	4.379*** (0.238)	4.412*** (0.237)	4.488*** (0.237)	2.317*** (0.332)	2.371*** (0.310)	2.789*** (0.272)
$Fourth\_Quintile_i$	4.621*** (0.235)	4.622*** (0.233)	4.632*** (0.235)	3.187*** (0.250)	3.089*** (0.253)	2.965*** (0.257)
$Richest_i$	4.664*** (0.234)	4.665*** (0.233)	4.670*** (0.235)	3.352*** (0.247)	3.258*** (0.251)	3.118*** (0.255)
$(Account_i)$ $*(poor_i)$	0.364* (0.224)	-	-	1.447** (0.434)	-	-
$(Account_i)$ $*(Second\_Quintile_i)$	0.483** (0.187)			1.712*** (0.382)	-	-
$(Account_i)$ $*(Middle\_Quintile_i)$	0.639** (0.194)			1.588*** (0.313)	-	-
$(Account\_Fin_i)$ $*(poor_i)$	-	0.423* (0.261)	-	-	1.660*** (0.448)	-
$(Account\_Fin_i)$ $*(Second\_Quintile_i)$	-	0.409* (0.219)	-	-	1.650*** (0.332)	-
$(Account\_Fin_i)$ $*(Middle\_Quinitile_i)$	-	0.577** (0.209)	-	-	1.480*** (0.294)	-
$(Account\_Mob_i)$ $*(poor_i)$	-	-	0.289 (0.336)	-	-	0.756 (0.543)
$(Account\_Mob_i)$ $*(Second\_Quintile_i)$	-	-	0.490* (0.297)	-	-	0.594 (0.408)
$(Account\_Mob_i)$ $*(Middle\_Quintile_i)$	-	-	0.587* (0.353)	-	-	0.736* (0.395)
$Constant$	-4.504*** (0.284)	-4.501*** (0.282)	-4.566*** (0.283)	-5.186*** (0.360)	-5.037*** (0.363)	-5.107*** (0.351)
Observations	1600	1600	1600	1600	1600	1600
R-Square	0.074	0.071	0.067	0.174	0.172	0.075
Likelihood ratio	-1026.26	-1029.68	-1033.62	-279.10	-279.79	-312.43

Table 4: Regression Results for Saving and Financial Inclusion for Cambodia

*Statistical Significance: *-10%, **-5%, ***- 1%*

We also observe that financial policies such as financial intermediation has a positive impact on financial inclusion in terms of increasing the savings of the poorer segments of the economy. We observed that that lowest (poor) quintile experience positive probability on saving at the bank if they have a direct account in a bank or financial institution. We also observed that mobile banking has little impact on the banking saving behavior of the poor.

There are several findings from our study on financial development and financial inclusion for Cambodia. A large share of savings is undertaken in terms of informal savings such as saving clubs and saving cooperatives. This leads to a large leakage of funds for productive investment. This will also have important implications for wealth creation for the poor in the domestic economy in terms of providing several wealth-creating low-risk based financial products to the poor to diversify their wealth. It is fundamental to increase formal savings in the economy through banks and financial institutions, in order to create efficiency in wealth creation in the domestic economy in terms of reducing asymmetric information issues in the informal financial markets.

In this paper, we also compared the financial market development of Cambodia and Vietnam. It was observed that Cambodia has a higher degree of openness in its financial market as compared to Vietnam. However, Vietnam has a higher level of financial inclusiveness compared to Cambodia. It is very clear from our study that financial intermediation is higher in Vietnam compared to Cambodia, which creates a positive impact on the probability of savings for the vulnerable population and mobilizes savings for productive investments. The impact of financial intermediation is clear with respect to financial inclusion and this is critical for Cambodia to increase the level of financial intermediation in terms of the poorest segments of society having a bank account in the domestic economy. The government needs to consider both the cost of opening a bank account as well as the cost of maintaining it.

Financial intermediation is also important to increase the effectiveness of monetary policy in the Cambodian economy as the level of deposit creation increases through the banks. This extra monetary tool, with well-regulated banks and financial markets, will assist in managing economic shocks in line with fiscal policies in the domestic economy.

We observed that effective financial intermediation (deposit creation) tends to increase financial inclusion and increase the saving of the poor segment in the Cambodian economy. The key for effective monetary policy is a well-regulated financial market and effective financial intermediation that creates economies of scale, reduces transaction cost and increase the mobilization of formal savings through financial markets.

It is also important for workers to develop a portfolio of skills that consists of education qualifications, skills certifications and intrinsic work experience. This portfolio of skills could be developed as part of an individual's skillset to create the foundation for lifelong learning and also to remain relevant in the economy as it moves to a higher stage of development. This is important for inclusive and sustainable growth. As highlighted above, a portfolio of skills (human capital) requires integrated education and training systems that provide 'different pathways' for human capital development.

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