Formal Financial Inclusion in Cambodia: What are the Key Barriers and Determinants?

SAM, Vichet

National Bank of Cambodia

18 May 2019

Formal Financial Inclusion in Cambodia: What are the Key Barriers and Determinants?

*Vichet Sam**

Abstract

This article investigates the barriers to formal financial inclusion in Cambodia, focusing on saving and credit strands. We propose the multinomial logit model, allowing to distinguish the outcome variable into three categories: Formal inclusion, Informal inclusion and Financial exclusion. We apply this model to the FinScope survey data conducted in late 2015, which represents the adult population in Cambodia. Results suggest that the trust to financial institutions, the financial literacy, the distance to banks or MFI, the lack of documentation and the service costs are the main obstacles, but these barriers affect the probability of using formal financial services differently according to the types of financial services (saving or credit). Gender, age, marital status, education, income, access to media and information, the use of mobile phone with the access to the Internet and the household size, are also found to be the main determinants.

---

*National Bank of Cambodia (NBC), Economic Research and International Cooperation (ERIC) department.
Email: samvichet77@gmail.com

I- Introduction

Finance is at the core of the development process. The well-functioning financial system is important in channeling funds to the most productive uses, thus boosting economic growth (Demirguc-Kunt et al., 2008). At the individual level, access to financial services such as savings, payment and credit, plays a key role in poverty alleviation because it allows households to save, invest in their human capital and insure against income and health shocks (Honohan and King, 2012). For example, improved financial inclusion is found to decrease rural poverty in India (Burgess and Pande, 2005) and increase employment in Mexico (Bruhn and Love, 2014). However, improving access to financial system is a challenge in many countries. Actually, the Findex data show that 1.7 billion adults, around 40 percent of adults in the world, are still unbanked in 2017. Thus, research on the determinants of financial inclusion is crucial because it would help policy makers to see what are the main barriers to financial inclusion and to find solutions on how to promote financial access to those who are likely to be financially excluded. This is particularly more important for developing countries such as Cambodia where many households are still financially excluded or might resort to informal products such as loans from moneylenders, but reliance on such products can tie them into poverty trap. This requires an investigation to see what are the main obstacles or determinants of formal financial inclusion in Cambodia, which is the objective of this paper.

By the World Bank's definition, financial inclusion is the access to a wide range of financial products and services such as payments, savings, credit and insurance, that are affordable or provided at reasonable cost, useful and able to meet the needs of households and businesses and provided in a responsible and sustainable manner.[1]

Under economic theories, financial inclusion/exclusion can be explained by the neoclassical and new-Keynesian theories. First, in the neoclassical model, economic agents are assumed to be rational, self-interested, well-informed and competitive. With these assumptions, financial exclusion should be the result of consumer choice (Abu Seman, 2016). For example, individual may prefer not to use formal financial services due to the economic costs, such as time to financial institutions or other charges, which may exceed the economic return from using those services. Second, the new-Keynesian analysis emphasizes on the market distortions such as information asymmetries. For instance, Stiglitz & Weiss (1981) provide explanations for the effect of imperfect information about borrowers on credit exclusion, whereby creditors tend to charge higher interest rates or other fees to avoid risky clients, consequently, some people who are lack of documents such as ID card, payroll slip,

---

[1] Source : http://www.worldbank.org/en/topic/financialinclusion/overview

leasehold estate among other documents, will find themselves in a difficult situation to access to formal credit services. Besides these two main economic theories, behavioral economics seek to provide further explanations on why some individuals are not included in the financial system by relaxing the assumption about human rationality (Abu Seman, 2016). Actually, some people may not trust financial institutions, due to negative experiences or perceptions that lead them to self-exclusion from financial services (Shankar, 2013). Furthermore, people with low education may not be as rational as highly-educated persons because they do not understand the benefits of using financial products and might be not aware of the risks of using informal services.

Based on these theories, Atkinson and Messy (2013) classify the barriers to financial inclusion into supply and demand-side barriers. On the supply side, the minimum balances required to open accounts are often too high for low income groups leaving those individuals unable or unwilling to access financial products. Lack of required documentation such as an ID card or passport can be another important barrier. The distance to financial institutions is also problematic because it creates prohibitive costs to access in terms of time and money, which may encourage individuals to keep cash at home, easy for them to control and access to their budget. On the demand side, education appears to be a main factor. Indeed, education can help people to learn about technological innovations aimed at reducing geographical barriers. However, some researches find that education is not strongly correlated with financial literacy[2], implying that individuals with higher education might not really understand how financial products work and this may also prevent individuals from making full use of their existing products.

Consequently, according to this theoretical framework, we formulate our following hypotheses:

H1: The distance from financial institutions would decrease the likelihood of using formal financial services.

H2: The lack of some documents (e.g., ID card, payslip and title deed) would decrease the likelihood of using formal services.

H3: High costs of formal financial services (e.g., high minimum balance for saving account and high interest rate for loans) would decrease the use of formal services.

H4: Individuals with a higher level of financial literacy would be more likely to use formal financial services.

---

[2] By definition, financial literacy is the ability to use one's knowledge and skills to effectively manage financial resources (World Bank, 2018).

H5: People with higher trust to financial institutions would be more likely to save or to borrow from financial institutions.

H6: Adults who prefer to consume than to save or who can borrow money from their families and communities when needed should be less likely to demand for formal financial products.

Several empirical studies were conducted to examine these barriers to financial inclusion in different developing countries. In Ghana, using the logit model applied to the World Bank Global Financial Inclusion Index, Akudugu (2013) finds that literacy, lack of money, lack of documentation and distance to financial institutions are the significant determinants of financial inclusion among the adult population. Using the same data, but with cluster specific fixed effect model, Soumaré et al. (2016) find that the main barriers to access formal financial services in Central and West Africa are: "Not enough money", "lack of necessary documentation", "high costs of financial services", "distance to formal financial institutions" and "lack of confidence in financial institutions". Recent findings indicate that financial literacy is a better determinant of financial inclusion compared to other factors. For instance, in Uganda, financially literate households have a higher potential to make informed decisions and are more likely to use new financial products and services (Akileng et al., 2018). Kumar et al. (2018) also highlights the importance of placing greater emphasis on addressing financial education rather than on improving the physical availability of banking services, in order to promote financial inclusion in India. The authors indicate that functioning financial markets do not only need good infrastructure, but also informed customers, with a higher degree of financial literacy. For cross countries evidence, Grohmann et al. (2018), using the instrumental variable approach, find that financial literacy improves financial inclusion in 93 countries.

Besides these barriers, individual and household characteristics are also expected to influence the probability of access to formal financial services. For example, Clamara et al. (2014) indicate that being female, lower education, lower income, being single, wages as a source of income, and residence in a rural area or smaller town reduce the likelihood of using financial products and services in Peru. Similar results are found by Pena et al. (2014) in Mexico. Looking at the Philippines case, Llanto (2015) indicates that age, marital status, household size, education of the household head and dependency ratio are significantly associated with access to formal credit. In China, richer, more educated, older men are more likely to be financially included (Fungacova and Weill, 2015).

If several studies were already conducted to investigate the determinants of financial inclusion, little has been known about Cambodia. In Cambodia, a small and open economy in Southeast-Asia, promoting financial inclusion is considered as a strategy to contribute to poverty

reduction. According to the FinScope data survey in 2015, access to formal finance reached 59% of the adult population, a significant stride from 6.5% in 2005 (NBC, 2017). Despite this impressive progress, financial access remains one of the major constraints among poor households in the rural area. Based on the descriptive approach, using data from four Cambodian Financial Service Providers (AMK, Amret, Sathapana Bank and WB Finance), customers' limited awareness of savings account ownership opportunities, low financial literacy, limited access points in rural areas and the attractiveness of informal savings are the key barriers to formal savings in Cambodia (UNCDF, 2018). However, descriptive statistics can be subject to bias, and it is hard to measure the magnitude of the impacts of those barriers on the probability of using formal financial inclusion. Recently, Lay (2018), using the probit regression, examines the impact of mobile phones on the use of formal banking services in five Asian countries, including Cambodia, and he finds that ownership of the mobile phone, education and time to banks are the main determinants of the use of formal banking services. However, he does not consider other barriers and determinants such as the lack of documentation, product costs, psychometric variables, financial literacy and household characteristics, which all may influence the access to financial services. In addition, he does not distinguish the type of financial products. For example, it is possible that the barriers to formal saving may differ from those of formal credit. Lastly, adults who do not use formal services may either use informal services or be financially excluded, and thus, they may also possess different characteristics.

This article aims at filling these gaps by looking for the determinants of and barriers to financial inclusion in Cambodia. We seek to answer to three research questions:

1- What are the main determinants of or barriers to formal financial inclusion in Cambodia?

2- Do the effects of those determinants on financial inclusion differ between saving and credit strands?

3- Are individual characteristics different between adults who use informal financial services and those who are financially excluded?

To answer to these questions, we use multinomial logit regression that allows comparing the probability for individuals to be formal financial included against informal included or financial excluded. We apply this model to the FinScope survey data in 2015 that represents the adult population in Cambodia.

This article is divided into the following sections: Section 2 describes the data, section 3 presents descriptive statistics, section 4 shows the empirical model and results, then section 5 concludes.

II- Data description

The FinScope Survey in Cambodia was conducted in 2015 by the National Institutes of Statistics (NIS) and the FinMark Trust that is an independent non-profit trust whose purpose is to promote the financial inclusion among the poor.[3] The objective of the Finscope survey is to measure the level of access to financial services by all adults, aged 18 years and older. In Cambodia, the survey was conducted by face-to-face interviews with 3,150 individuals, nationally representative of the adult population, from November 2015 to January 2016. The surveys records details about respondents' personal characteristics, their household characteristics and the levels of access to financial services and products.

In the data, they classify the individual access to finance in three categories: Formal access, informal access and financial exclusion.[4] The data also distinguishes the access into different products, but we would focus in this paper only the saving and credit services. Table 1 below presents the financial access of the sample individual:

Table 1: Access to Finance

Access	Saving		Credit	
	Obs.	%	Obs.	%
Formal	319	10.1	940	29.8
Informal	1109	35.2	484	15.4
Excluded	1722	54.7	1726	54.8
Total	3150	100.0	3150	100.0

Source: Author's calculation using the FinScope data (2015)

Around half of individuals have access to financial products/services in terms of saving and credit. However, for saving, there exists a lower number of individuals who approach the formal services (10%) than the informal (35%). Given that a high number of people do not save or borrow, while a non-negligible rate of adults uses informal products/services, an investigation to see what are the barriers to formal financial inclusion in Cambodia is crucial.

---

[3] More description about the FinMark Trust is available here: https://finmark.org.za/about/

[4] 'Formal inclusion' is a category classifying products or services as regulated or supervised by a formal institution like the National Bank of Cambodia (NBC) or any other formal regulator/agency. "Informal inclusion" refers to financial products and/or services, which are not regulated and operate without legal governance. "Financial exclusion" refers to adults who do not have/use any financial products and/or services – neither formal nor informal. Reference:
http://www.finmark.org.za/wp-content/uploads/2016/07/finscope-cambodia-pocket-guide.pdf

As we have seen in the literature review, there exist many barriers to financial inclusion. First, the distance to financial institutions and the necessary documents for opening saving accounts or access to formal credit are among the main barriers. The FinScope data provide information on the time to Microfinance institution (MFI) and the time to Bank. Then, we pick the time to the nearest bank or MFI, and we classify the answers into four categories: "less than 5 minutes", "5-59 minutes", "1h-1h59 minutes" and "More than 2 hours". Regarding the required documents for using financial services, we employ three variables: The "identity document", the "payslip" and the "title deed" that equal 1 if the individual possesses the documents and 0 otherwise. Indeed, individuals are required to provide their ID documents to open a saving account, while the "payslip" and the "title deed" could be required when they request for credit. Next, the costs of using formal financial services can be also problematic. For example, according to Narain (2009), the minimum deposit requirement was over 700 USD in a commercial bank in Cameroon, which is too high for poor people. These costs are, however, not available in our data, and even if they are available, we will never observe the costs of using formal financial services among individuals who do not use these services. However, in the questionnaire, those adults were asked about the factors they would consider before deciding to open an account or use the credit services of a financial institution. People who pick "low minimum balance" and "low interest on loans" should be more sensitive to the costs of financial products usage. Therefore, we select these variables as proxy for the costs of formal financial services in the sense that if the coefficients of these variables are negative for the probability of formal financial inclusion, the costs of using formal services might be too high, and thus, they are less likely to be formally financial included. Then, financial literacy may play a main role in promoting the formal financial inclusion. Unfortunately, there is no information that directly measures the level of financial literacy among adults in the FinScope survey. Given that the INFE[5] defines financial literacy as: "A combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial well-being", we use, consequently, answers to three questions in the questionnaire as a proxy for the level of financial literacy: 1-Have you heard about mobile money? 2-Have you ever heard of insurance? (These two questions measure the awareness of adults towards financial products) 3- Do you keep track of your income and expenditure on a monthly basis? (This question measures their attitude in financial decisions). Adults would get one score if they answer "Yes" to each question. Thus, there are four possible groups: "Score=0: No financial literacy", "Score=1: Low level of financial literacy", "Score=2: Medium level of financial literacy", "Score=3: High level of financial literacy". Next, the data also provide information regarding the people's trust towards financial institutions such as Bank and MFI. Given that the trusts to bank and to MFI are

---

[5] INFE: The International Network on Financial Education.

strongly correlated, we calculate the average level and classify into three categories: "No trust", "Trust" and "Strongly trust". Lastly, it is also possible that some adults do not need formal financial products at all. For example, in the FinScope questionnaire, adults were asked about their perceptions of saving and borrowing. We consider individuals who picked the answers "Enjoying money now is better than saving for the future" and "Possibility to borrow money from the community or from the family when needed" are those who may not need formal financial services. Indeed, if they prefer to consume today than tomorrow, they may prefer not to save. In terms of borrowing, if they can easily borrow money from their families or communities, they might not need to borrow from formal financial institutions.

Besides these main barriers, we also control other determinants of financial inclusion related to individual and household characteristics such as gender, educational level, age, marital status, family size, access to information media, income, location of household (urban or rural areas) and other variables.

III- Descriptive statistics

Table 2: Descriptive statistics

Variables	Formal Saving		Informal Saving		Excluded	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Individual and household characteristics						
Age	44.5	14.0	43.6	13.5	43.5	16.1
Gender	0.45	0.50	0.34	0.47	0.39	0.49
Marital status: Single	0.09	0.29	0.06	0.24	0.13	0.33
Educational level	2.83	0.87	2.21	0.79	2.18	0.79
Good health	0.50	0.50	0.31	0.46	0.33	0.47
Experienced household problems in the last 12 months	0.41	0.49	0.45	0.50	0.46	0.50
Respondent is household head	0.57	0.50	0.45	0.50	0.46	0.50
Monthly income	3.14	0.93	2.46	1.08	2.39	1.14
Regular income	0.29	0.45	0.11	0.31	0.12	0.32
Salary employee	0.33	0.47	0.19	0.39	0.27	0.44
Self-employed	0.36	0.48	0.29	0.46	0.22	0.41
Farming	0.11	0.31	0.37	0.48	0.28	0.45
Use of cell phone	0.91	0.29	0.81	0.40	0.67	0.47
Use of cell phone x Internet	0.35	0.48	0.09	0.29	0.09	0.29
Access to Television	0.94	0.23	0.83	0.37	0.73	0.45
Access to Radio	0.48	0.50	0.36	0.48	0.42	0.49
Access to Magazine or Newspapers	0.35	0.48	0.14	0.35	0.12	0.32
Number of members in household	5.23	2.16	4.95	1.93	4.88	2.05
Number of members aged lower than 18	1.58	1.43	1.78	1.43	1.77	1.53
Rural areas	0.40	0.49	0.73	0.44	0.74	0.44
Barriers to financial inclusion						
Time to Bank or MFI	1.75	0.55	2.15	0.60	2.15	0.63
Having ID card or Passport	0.98	0.15	0.95	0.21	0.95	0.21
Having a payslip	0.14	0.35	0.03	0.17	0.07	0.25
Having a title deed	0.64	0.48	0.56	0.50	0.49	0.50
Factors considered before using services of a financial institution:						
Low minimum balance for saving accounts	0.07	0.25	0.07	0.25	0.07	0.26
Financial literacy	1.83	0.89	1.23	0.95	0.98	0.87
Trust to Bank and MFI	2.19	0.43	2.09	0.45	2.11	0.41
Perceptions on saving/investment and borrowing/credit:						
No trust in investing in stock or share or other securities	0.36	0.48	0.48	0.50	0.28	0.45
Enjoying money now is better than saving for the future	0.28	0.38	0.28	0.45	0.16	0.36
Total observation	319		1109		1722	

Table 2: Descriptive statistics (continued)

Variables	Credit					
	Formal Credit		Informal Credit		Excluded	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Individual and household characteristics						
Age	42.3	12.2	42.2	13.3	44.8	16.70
Gender	0.37	0.48	0.32	0.47	0.39	0.49
Marital status: Single	0.05	0.22	0.03	0.18	0.14	0.35
Educational level	2.22	0.74	2.13	0.78	2.31	0.86
Good health	0.33	0.47	0.34	0.47	0.35	0.48
Experienced household problems in the last 12 months	0.49	0.50	0.61	0.49	0.38	0.38
Respondent is household head	0.47	0.50	0.48	0.50	0.47	0.50
Monthly income	2.55	1.11	2.21	1.09	2.54	1.13
Regular income	0.12	0.32	0.07	0.25	0.16	0.36
Salary employee	0.24	0.43	0.21	0.41	0.26	0.44
Self-employed	0.26	0.44	0.23	0.42	0.27	0.44
Farming	0.33	0.47	0.40	0.49	0.24	0.43
Use of cell phone	0.76	0.43	0.76	0.43	0.73	0.45
Use of cell phone x Internet	0.10	0.30	0.06	0.24	0.14	0.35
Access to Television	0.78	0.41	0.76	0.43	0.80	0.40
Access to Radio	0.38	0.49	0.30	0.46	0.44	0.50
Access to Magazine or Newspapers	0.14	0.35	0.05	0.23	0.18	0.39
Number of members in household	5.19	2.02	4.94	1.93	4.81	2.03
Number of members aged lower than 18	2.02	1.54	1.99	1.54	1.54	1.41
Rural areas	0.73	0.44	0.80	0.40	0.66	0.47
Barriers to financial inclusion						
Time to Bank or MFI	2.11	0.54	2.23	2.23	2.07	0.65
Having ID card or Passport	0.96	0.19	0.96	0.19	0.95	0.22
Having a payslip	0.08	0.27	0.04	0.20	0.06	0.23
Having a title deed	0.59	0.59	0.49	0.50	0.50	0.50
Factors considered before using services of a financial institution:						
Low interest rate on loans	0.52	0.50	0.29	0.45	0.56	0.50
Financial literacy	1.17	0.90	1.20	0.94	1.14	0.95
Trust to Bank and MFI	2.15	0.40	2.13	0.46	2.09	0.43
Perceptions on saving/investment and borrowing/credit:						
People in the community borrow money to manage their lives	0.69	0.46	0.73	0.45	0.63	0.48
Possibility to borrow money from the community when needed	0.42	0.49	0.56	0.50	0.40	0.49
Possibility to borrow money from the family when needed	0.61	0.49	0.73	0.44	0.60	0.49
It is embarrassing to borrow money or buy on credit	0.45	0.50	0.64	0.48	0.48	0.50
Total observation	940		484		1726	

Based on the table 2, we observe that several variables may affect the probability of being financially included, but their impacts might be different according to whether financial inclusion is measured in terms of credit or saving. For example, the average time spent to bank/MFI is the lowest among the group of people who formally save, suggesting that the farther from the financial institutions, the lower probability that individuals would save at financial institutions. However, in terms of credit, it seems that people are less likely to borrow from financial institutions if they are near those institutions. In addition, the characteristics of individuals who belong to the group of people who use informal financial products/services may also differ from those who are financially excluded. For example, men seem to be less likely to borrow money, but if they do, it seems that they are more likely to get access to the formal credit than the informal. Thus, putting all individuals without access to formal financial services in one group might be bias. Therefore, this article proposes the multinomial logit model that can distinguish the outcome variable into three categories: formal financial inclusion in terms of saving or credit, informal financial inclusion and financial exclusion.

IV- Method and Results

IV-1 Method

In our multinomial logit model, we have a dependent variable, y, with three different outcomes: "Formal financial inclusion", "Informal financial inclusion" and "Financial exclusion". In the multinomial logit model, we estimate a set of coefficients, β_1, β_2, β_3, corresponding to each outcome:

$$\Pr(y = 1) = \frac{e^{X\beta^{(1)}}}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y = 2) = \frac{e^{X\beta^{(2)}}}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y = 3) = \frac{e^{X\beta^{(3)}}}{e^{X\beta^{(1)}} + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

The model, however, is unidentified in the sense that there is more than one solution to $\beta^{(1)}$, $\beta^{(2)}$ and $\beta^{(3)}$, which leads to the same probabilities for $y = 1$, $y = 2$, and $y = 3$. To identify the model, we arbitrarily set "Formal financial inclusion" as the base outcome, thus $\beta^{(1)} = 0$, and the equation becomes:

$$\Pr(y = 1) = \frac{1}{1 + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y = 2) = \frac{e^{X\beta^{(2)}}}{1 + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

$$\Pr(y = 3) = \frac{e^{X\beta^{(3)}}}{1 + e^{X\beta^{(2)}} + e^{X\beta^{(3)}}}$$

Consequently, the relative probability of $y = 2$ (Informal financial inclusion) to the base outcome is:

$$\frac{\Pr(y = 2)}{\Pr(y = 1)} = e^{X\beta^{(2)}}$$

This ratio is called the relative risk, and assume that X and $\beta_k^{(2)}$ are the vectors equal to $(x_1, x_2, \dots, x_k)$ and $(\beta_1^{(2)}, \beta_2^{(2)}, \dots, \beta_k^{(2)})'$, respectively, the ratio of the relative risk for a one-unit change in x_i is then

$$\frac{e^{\beta_1^{(2)}x_1 + \cdots + \beta_i^{(2)}(x_i+1) + \cdots + \beta_k^{(2)}x_k}}{e^{\beta_1^{(2)}x_1 + \cdots + \beta_i^{(2)}x_i + \cdots + \beta_k^{(2)}x_k}} = e^{\beta_i^{(2)}}$$

Thus, the exponentiated value of a coefficient is the relative-risk ratio for a one-unit change in the corresponding variable (risk is measured as the risk of the outcome relative to the base outcome).

To employ the multinomial logit model, it is recommended to check the independence of irrelevant alternatives (IIA) assumption, which means that the inclusion or exclusion of the outcome categories should not affect the relative risks associated with the regressors in the remaining categories. To check this assumption, we employ three tests, Hausman tests, suest-based Hausman tests and Small-Hsiao tests. Table 3 below reports the results:

Table 3A: Hausman tests of IIA assumption (N=3150)

Ho: Odds (Outcome-J vs Outcome-K) are independent of other alternatives

	Saving model			Credit model		
	chi2	df	P>chi2	chi2	df	P>chi2
Formal	3.683	39	1	0.032	41	1
Informal	13.001	11	0.293	-8.972	41	.
Excluded	-26.025	33	.	-314.415	41	.

Note: A significant test is evidence against Ho.

Note: If chi2<0, the estimated model does not meet asymptotic assumptions.

Table 3B: suest-based Hausman tests of IIA assumption (N=3150)

Ho: Odds (Outcome-J vs Outcome-K) are independent of other alternatives

	Saving model			Credit model		
	chi2	df	P>chi2	chi2	df	P>chi2
Formal	33.628	40	0.751	36.812	42	0.698
Informal	53.198	40	0.079	26.856	42	0.967
Excluded	56.807	40	0.041	35.93	42	0.734

Note: A significant test is evidence against Ho.

Table 3C: Small-Hsiao tests of IIA assumption (N=3150)

Ho: Odds (Outcome-J vs Outcome-K) are independent of other alternatives

	Saving model					Credit model				
	lnL(full)	lnL(omit)	chi2	df	P>chi2	lnL(full)	lnL(omit)	chi2	df	P>chi2
Formal	-816.808	-804.884	23.848	40	0.98	-438.453	-419.752	37.404	42	0.673
Informal	-325.749	-303.789	43.92	40	0.309	-776.307	-750.512	51.591	42	0.147
Excluded	-307.39	-288.448	37.884	40	0.566	-386.52	-366.241	40.559	42	0.534

Note: A significant test is evidence against Ho.

Based on these three tests above, overall, the IIA assumption is met, thus, using the multinomial logit model is suitable.

Next, before we run the regression, we should also check the possible multicollinearity between independent variables that we have selected. One common way to measure multicollinearity is the variance inflation factor (VIF), which assesses how much the variance of an estimated regression coefficient increases if the predictors are correlated (Wooldridge, 2012, p.98). Table 4 below presents the results of multicollinearity test using VIF:

Table 4: Variance inflation factor

Variable	VIF Values	
	Saving	Credit
Age	41.04	41.2
Squared Age	38.58	38.74
Male	1.5	1.5
Marital status: Single	1.45	1.46
Base reference: No formal education		
Primary education	2.24	2.24
Secondary education	2.59	2.59
Above secondary education	1.86	1.87
Good health	1.2	1.19
Experienced risks in the last 12 months	1.08	1.08
Respondent is household head	1.79	1.79
Base reference: Income-Q1 (60 USD or less)		
Income-Q2 (61-135 USD)	1.57	1.57
Income-Q3 (136-350 USD)	1.81	1.82
Income-Q4 (Above 350 USD)	1.82	1.86
Regular income	1.24	1.26
Salary employee	2.05	2.04
Self-employed	2	1.99
Farmers	2.06	2.06
Use of cell phone	1.34	1.34
Use of cell phone x Internet	1.46	1.46
Access to Television	1.24	1.26
Access to Radio	1.13	1.12
Access to Magazine or Newspapers	1.25	1.26
Number of members in household	2.1	2.11
Number of members aged lower than 18	2.11	2.11
Rural areas	1.59	1.61
Base reference: Less than 5 minutes		
Time to Bank or MFI: Between 5 and 59 minutes	2.61	2.63

Time to Bank or MFI: Between 1h and 1h 59 minutes	2.64	2.64
Time to Bank or MFI: More than 2 hours	1.52	1.52
Having ID card or Passport	1.04	1.04
Having a payslip	1.11	1.14
Having a title deed	1.15	1.15
Factors considered before using services of a financial institution		
Low minimum balance for saving accounts	1.12	NA
Low interest rate on loans	NA	1.12
Base reference: Score = 1		
Financial literacy: Score = 2	1.58	1.59
Financial literacy level: Score = 3	1.75	1.76
Financial literacy level: Score = 4	1.47	1.48
Base reference: No trust		
Trust to Bank and MFI: Trust	4.08	4.12
Trust to Bank and MFI: Strongly Trust	4.16	4.15
Perceptions on saving/investment and borrowing/credit		
No trust in investing in stock or share or other securities	1.12	NA
Enjoying money now is better than saving for the future	1.07	NA
People in the community borrow money to manage their lives	NA	1.32
Possibility to borrow money from the community when needed	NA	1.38
Possibility to borrow money from the family when needed	NA	1.19
It is embarrassing to borrow money or buy on credit	NA	1.19
Mean VIF	3.71	3.61

Wooldridge (2012) [p.98] states that a VIF value smaller than 10 is acceptable because the correlations between independent variables would not cause serious problems. According to the Table 4, we observe that the mean VIF values are only 3.71 and 3.61 for the saving and borrowing models, respectively. In addition, each variable possesses a VIF value less than 5, in accordance with the conventional threshold (VIF < 10), except the variable "Age" that is highly correlated with the variable "Squared Age"[6].

---

[6] We would like to test the non-linear relationship of the variable "Age" and dependent variables, so including "Squared Age" is a must, despite their correlation.

IV-2 Regression Results

Table 5: Regression results

Variables (base outcome: Formal saving/credit)	Saving		Credit	
	Informal	Do not save	Informal	Do not borrow
	RRR	RRR	RRR	RRR
Age	1.0201	0.9272**	0.9417**	0.8611***
	(0.0349)	(0.0310)	(0.0281)	(0.0183)
Squared Age	0.9997	1.001**	1.001**	1.002***
	(0.0004)	(0.0003)	(0.0003)	(0.001)
Male	1.1931	1.5128**	0.7975	1.0186
	(0.2276)	(0.2838)	(0.1258)	(0.1154)
Marital status: Single	0.7798	1.5047	0.5520*	2.1627***
	(0.2583)	(0.4484)	(0.1795)	(0.4114)
Base reference: No formal education	NA	NA	NA	NA
Primary education	0.5780	0.6429	0.7490	0.4114*
	(0.2038)	(0.2249)	(0.1340)	(0.1081)
Secondary education	0.4750**	0.4848**	0.9374	0.9594
	(0.1714)	(0.1779)	(0.2041)	(0.1676)
Above secondary education	0.2465***	0.2425***	1.4062	1.6080*
	(0.1029)	(0.1022)	(0.4934)	(0.4311)
Good health	0.7828	0.8875	1.2629*	1.1030
	(0.1369)	(0.1367)	(0.1763)	(0.1195)
Experienced household problems in the last 12 months	0.8725	0.9377	1.5455***	0.6397***
	(0.1369)	(0.1443)	(0.1993)	(0.0617)
Respondent is household head	0.5287***	0.5663***	1.0862	0.9371
	(0.1074)	(0.1098)	(0.1857)	(0.1167)
Base reference: Income-Q1 (60 USD or less)	NA	NA	NA	NA
Income-Q2 (61-135 USD)	1.0116	0.7184	0.8742	1.0694
	(0.2673)	(0.1860)	(0.1492)	(0.1393)
Income-Q3 (136-350 USD)	0.6166*	0.4754***	0.6865**	0.8589
	(0.1722)	(0.1262)	(0.1269)	(0.1214)
Income-Q4 (Above 350 USD)	0.42108***	0.3273***	0.6183***	0.81556
	(0.1088)	(0.0813)	(0.6183)	(0.1222)
Regular income	0.7464	0.6087**	0.7407	1.0579
	(0.1720)	(0.1403)	(0.1675)	(0.1598)
Salary employee	1.1526	1.2998	0.9224	1.010
	(0.2691)	(0.2921)	(0.1877)	(0.1549)
Self-employed	1.6467**	1.0198	0.9204	1.0222
	(0.3190)	(0.1920)	(0.1933)	(0.1493)

Farmer	2.4937***	1.2672	1.010	0.7854
	(0.6095)	(0.3177)	(0.1931)	(0.1166)
Use of cell phone	1.3519	0.7768	1.0833	0.9285
	(0.35024)	(0.1897)	(0.1800)	(0.1049)
Use of cell phone x Internet	0.6573*	0.5875***	0.8830	1.0380
	(0.1513)	(0.1078)	(0.2382)	(0.1854)
Access to Television	0.9379	0.5017**	1.1200	1.0606
	(0.2915)	(0.1496)	(0.1688)	(0.1286)
Access to Radio	0.8750	1.0966	0.7811*	1.1120
	(0.1390)	(0 .1731)	(0.1104)	(0.1059)
Access to Magazine or Newspapers	0.7344*	0.6576**	0.4936 ***	1.0837
	(0.1213)	(0.1195)	(0.1339)	(0.1469)
Number of members in household	0.8664***	0.8572***	0.8997**	0.9624
	(0.0439)	(0.0425)	(0.0422)	(0.0303)
Number of members aged lower than 18	1.1077	1.1634**	1.0486	0.9113**
	(0.0704)	(0.0750)	(0.0615)	(0.9113)
Rural areas	1.2883	1.0051	0.8997	0.8864
	(0.2525)	(0.2189)	(0.1916)	(0.12135)
Base reference: Less than 5 minutes	*NA*	*NA*	*NA*	*NA*
Time to Bank or MFI: Between 5 and 59 minutes	2.2686***	1.7205**	1.1051	0.5738***
	(0.4713)	(0.3930)	(0.3234)	(0.0944)
Time to Bank or MFI: Between 1h and 1h 59 minutes	2.004*	1.8929*	1.1257	0.5997**
	(2.003)	(0.7029)	(0.3856)	(0.1333)
Time to Bank or MFI: More than 2 hours	2377555***	1486897***	2.4667**	0.1333
	(922020.6)	(574772)	(1.0687)	(0.3731)
Having ID card or Passport	0.8882	0.9833	1.5600	0.9255
	(0.4712)	(0.4906)	(0.4452)	(0.2044)
Having a payslip	0.2852***	0.6802	0.4229**	0.6065**
	(0.0915)	(0.1637)	(0.4229)	(0.1338)
Having a title deed	0.7938	0.7420**	0.6290***	0.7120***
	(0.1233)	(0.1084)	(0.0880)	(0.0760)
Factors considered before using services of a financial institution:				
Low minimum balance for saving accounts	1.0824	1.4518	*NA*	*NA*
	(0.3633)	(0.4848)		
Low interest rate on loans	*NA*	*NA*	*0.3897****	*1.1676**
			(0.0552)	*(0.1192)*
Base reference: Score = 0: No financial literacy	*NA*	*NA*	*NA*	*NA*
Score = 1: Low level of financial literacy	0.5210**	0.4609***	1.0564	0.7400**
	(0.1439)	(0.1195)	(0.1676)	(0.0918)
Score = 2: Medium level of financial literacy	0.3583***	0.2505***	1.2520	0.7854*
	(0.0983)	(0.0651)	(0.2216)	(0.1077)

Score = 3: High level of financial literacy	0.2563***	0.1087***	1.3091	0.9276
	(0.0869)	(0.0355)	(0.3546)	(0.1963)
Base reference: No trust	*NA*	*NA*	*NA*	*NA*
Trust to Bank and MFI: Trust	0.2881**	0.5464	0.3958***	0.2881***
	(0.1448)	(0.2896)	(0.1396)	(0.0941)
Trust to Bank and MFI: Strongly Trust	0.2497***	0.2896	0.3802**	0.2281***
	(0.1308)	(0.2442)	(0.1420)	(0.0757)
Perceptions on saving/investment and borrowing/credit:				
No trust in investing in stock or share or other securities	1.149074	0.5606***	*NA*	*NA*
	(0.1865)	(0.0988)		
Enjoying money now is better than saving for the future	1.9381***	1.1193	*NA*	*NA*
	(0.3989)	(0.2367)		
People in the community borrow money to manage their lives	*NA*	*NA*	1.0235	0.7793**
			(0.1521)	(0.0782)
Possibility to borrow money from the community when needed	*NA*	*NA*	1.5186***	0.9753
			(0.2292)	(0.1073)
Possibility to borrow money from the family when needed	*NA*	*NA*	1.5003***	0.9653
			(0.2271)	(0.0998)
It is embarrassing to borrow money or buy on credit	*NA*	*NA*	1.6978***	1.1336
			(0.2214)	(0.1199)
Constant	62.3310***	2811.49***	4.1313*	507.858***
	(69.5005)	(2951.2)	(3.455672)	(338.5836)
Log pseudolikelihood	-2432.3563	-2432.3563	-2681.912	-2681.9121
Pseudo R2	0.1693	0.1693	0.1297	0.1297
Observation	3150	3150	3150	3150

***p < 0.01; **p < 0.05; *p < 0.1　　　　*Note: Robust standard errors are in brackets (given the nature of survey data, the regression is clustered at the village level.)*

Based on the regression results, we observe that there exist several variables that affect the probability of formal financial inclusion. Nevertheless, the impacts of those variables differ according to the type of financial products/services (saving or credit) and whether we compare the group of people with access to formal services to those using informal services or to those who are financially excluded.

First, regarding individual characteristics, age increases the probability of using formal financial services, but only up to a certain age as found by Soumaré and Tchana (2018). For instance, older people are more likely to have formal savings, but from the age of 55, they are more likely not to save. This is consistent with the Life Cycle Hypothesis that people are at their most productive age, they tend to save more, but the savings are bound to dwindle as they approach their retirement age (Ouma et al., 2017). Similarly, age also increases the probability of using formal credit, but from their

forties, they are more likely to borrow from informal lenders or not to borrow at all. Then, if several studies find a gender gap in terms of access to financial products, we do not find any discrimination against women in Cambodia. Actually, if we only regress our dependent variables on "gender" variable, being a man does increase the likelihood of access to formal services. Nevertheless, when we control their level of education, the positive outcome of being a man disappears. This shows that to overcome the gender gap in Cambodia, increasing the women's access to education would help. Furthermore, in our Table 5, we even observe that men are more likely not to save compared to women. Indeed, women play a crucial role in the household's savings in Cambodia-many men give their wage/salary to their wives to keep, because they believe that women are more rational in spending and in calculating the optimal amount to save for their future or their children. Thus, to promote formal savings in Cambodia, women could be a main target. Being single is found to be more likely not to borrow because they may not have financial needs as found by Clamara et al. (2014), but no association is observed between marital status and savings. In contrast, if education is not found to play a main role in terms of formal credit access, education does strongly increase the probability of formal savings like previous literature (Clamara et al., 2014; Llanto et al., 2015, Lay, 2018). For instance, the probability that adults with secondary education save informally rather than formally is 52% lower if we compare to the adults without formal education. This probability increases up to 75% for adults with above secondary education. Similar results are obtained if we compare the groups of adults who save formally to those who do not save at all.

Then, besides those demographic variables, we also find that individuals who experienced problems in the household in the past 12 months (flooding, death or illness of family members for example) are more likely to borrow money, especially from the informal services. Perhaps, the process of getting credit from informal lenders might be faster than from formal institutions that could answer to the needs of people who were facing problems and urgently needed money. Then, as mentioned by Llanto et al. (2017), adults who are household heads tend to save more formally. Indeed, Clamara et al. (2014) stated that if there is already one person in the household who has a financial product, the other members may share this product rather than acquiring a new one, and normally it is the head of household who is the first person to use the financial products. Looking at the income variable, income is found to increase the probability of using formal financial services as found by Clamara et al. (2014). For instance, people who earn between 136 and 350 USD are 38% (and 52%) less likely to save informally (or not to save) than to save formally in comparison to those who earn lower than 60 USD. This probability increases up to 57% (and 67%) for those who earn more than 350 USD. Concerning the source of income, we find that self-employed and farmers are more likely to save informally than formally, but no significant relation is found in terms of credit usage. Next, if Lay (2018)

finds that ownership of mobile phone has a positive impact on the use of banking services, we do not find any impacts from the use of mobile phone.[7] Only if we interact with the access to the Internet that the use of mobile phone does promote formal saving. Given that 75% of the adult population use the mobile phone, but only 10% have access to the Internet, based on the FinScope data, to foster the access to financial products through mobile phone, Cambodia also needs to reduce the cost of Internet services and improves the network quality, especially in the rural areas. In addition, we also find that the access to media communication such as television, radio and especially magazine or newspapers do promote financial inclusion in Cambodia. This means that we need to promote the reading culture among the Cambodian adults given that only 15% of the adult population read magazine or newspapers. The size of the household also has a positive impact on the probability of formal saving, but for the households with more members aged lower than 18, the probability of not saving increases while the likelihood of not borrowing decreases. This suggests that the size of households influences the demand for savings products and credit in different ways depending on the composition of the household as mentioned by Steiner et al. (2009).

Next, regarding the barriers to financial inclusion, the distance to financial institutions do play a main role. The farther from the financial institutions, the less likely adults will save formally. For instance, for those who must spend more than 2h to reach the nearest financial deposit institution, they would not use the formal saving product at all. This is consistent with the neoclassical model in which individuals may prefer not to use the financial service if the marginal cost exceeds the marginal return of using the service. This confirms our H1 that the distance from financial institutions would decrease the likelihood of using formal savings. Nevertheless, if we compare the group of adults with formal credit and those who do not borrow at all, we find that adults are 67% more likely to borrow from formal financial institutions than not to borrow if their houses are between 1h and 1h 59 away from financial institutions than those who live less than 5 minutes from the financial institutions. This result suggests that people might be shy to borrow money if they are too near the financial institutions. However, it is also possible that those who are near the financial institutions simply do not have the needs for credit.[8] Then, when we compare the group of adults with formal credit to those with informal credit, we find that the farther from the formal financial institutions, the more likely

---

[7]Lay (2018) uses the variable "ownership of mobile phone", while we use the variable "the usage of mobile phone". We prefer this later variable because there are 815 missing observations for the "ownership" variable. However, even though we use the variable "ownership", the impact of mobile phone is not statistically significant without interacting with "Internet access" in our regression.

[8] Please note that we also include variables related to "Financial needs" and "Feeling embarrassed to borrow money" in our regression, therefore, it is possible that our finding is at least partly driven by the problem of being ashamed to borrow money from financial institutions when they are too near.

that people will borrow money from the informal sources. For instance, for adults who live at least 2h away from formal financial institutions, the probability to take informal credit rather than formal credit increases up to 2.47 times in comparison to adults who live less than 5 minutes from those institutions.

Concerning the "Know Your Customer" information, we do not find that having an ID card or passport increases the probability of formal financial inclusion. Actually, in our data, 96% of adults have an ID or passport, consequently, this should be not a barrier to financial inclusion in Cambodia. Next, we clearly observe that having a payslip and a title deed increase the formal financial inclusion, especially in terms of credit. For instance, having a payslip decreases the likelihood of taking informal credit instead of formal credit by 58% and having a title deed decreases it by 37%. This confirms our H2 that the lack of documentation would decrease the likelihood of using formal financial services.

Next, adults who consider the low interest rate on loans as one of the most important factors before they decide to borrow from a financial institution are 16% more likely not to borrow at all, but if they borrow, they are 61% less likely to take informal credit than the formal. This result suggests that the cost of formal credit might be much lower than the cost of informal credit, however, the credit costs from financial institutions might be still high for some individuals that choose not to borrow at all. Thus, if we can reduce the cost of formal credit, it might help to increase the use of formal loans. Promoting formal local savings can be one of possible solutions, because this would allow reducing the cost of funds for financial institutions in Cambodia, and in the data, we observe that only 10% save formally.

Regarding the barriers from the demand side, financial literacy appears to play a crucial role in promoting formal savings in Cambodia. For instance, adults with low financial literacy are found to rather save formally than informally by 1.92 times higher than adults with no financial knowledge. This ratio increases up to 2.79 times for adults with a medium level of financial knowledge and 3.9 times if they possess a high level of financial literacy. The same, in comparison to adults with no financial knowledge, adults with low financial literacy are found to rather save formally than not to save by 2.17 times higher, then 3.99 times higher for adults with a medium level of financial knowledge and 9.2 times higher for those with a high level of financial literacy. This does confirm our H4 that individuals with a higher level of financial literacy would be more likely to use formal financial services as indicated by recent findings (Akileng et al., 2018; Kumar et al., 2018; Grohmann et al., 2018 and UNCDF, 2018). Nevertheless, in terms of credit, the impact of financial literacy is not clear, suggesting that the demand for formal credit could be driven by other factors than the financial knowledge.

Next, the people's trust to financial institution also plays a vital role in terms of both formal saving and credit. In comparison to individuals with no trust on financial institutions, we find that adults who trust banks and MFI are 71% less likely to save informally and this likelihood increases to 75% if they strongly trust. For credit, they are 60% less likely to borrow from the informal sources if they trust banks and MFI, and 62% less likely if they strongly trust. In addition, adults who trust (or strongly trust) in financial institutions are also 71% (or 77%) less excluded. This thus confirms our H5 that people with higher trust to financial institutions would be more likely to save or to borrow from financial institutions as also mentioned by Shankar (2013).

Next, we also try to test the perception of adults on saving/investment and borrowing/credit, because these perceptions could reflect the degree of their financial needs. For example, people who do not trust in investing in the stock or share or other securities may have stronger demands for saving as found by Honohan and King (2012) that people with risk aversion tend to save more than to invest. Indeed, we find that those adults are 1.78 times more likely to save, either formally or informally, than not to save at all. Then, people who prefer to enjoy their money right now rather than saving for the future tend to save more informally than formally. This could be explained by the fact that people might believe that keeping cash at home would be easier for them to spend their money whenever they want, as mentioned by Atkinson and Messy (2013). Therefore, the development and promotion of e-payment system could induce these individuals to keep their cash more at financial institutions. Regarding the credit usage, individuals who have possibilities to borrow money from their families or communities when they need, tend to borrow more informally than formally by 1.5 times. This is consistent with what is found in China by Lyons et al. (2017) that if individuals have stronger local networks, they might be more likely to rely on their informal network to meet their borrowing needs. Similarly, adults who find embarrassing to borrow money or buy on credit prefer to borrow from the informal sources than to refer to formal credit. Given that 49.5% of adults who feel embarrassed to borrow money, this suggests that we need to educate the population more about this issue.

IV-3 Simulation Results

Using the multinomial logit model also allows us to calculate the probability that individuals belong to a particular outcome group given their characteristics and the barriers that they faced. Table 6 below presents the simulation results:

Table 6: Probability to be formal/informal financial included or financial excluded

| Barriers | Outcome prediction (probability) | | | | | |
| | Saving | | | Credit | | |
	Formal	Informal	Do not save	Formal	Informal	Do not borrow
Distance-related barrier						
Time to bank or MFI less than 5 minutes	0.15	0.29	0.56	0.24	0.11	0.65
Time to bank or MFI between 5 and 59 minutes	0.09	0.37	0.54	0.31	0.16	0.53
Time to bank or MFI between 1 hour and 1 hour 59 minutes	0.09	0.33	0.58	0.31	0.16	0.54
Time to bank or MFI from 2 hours up	0.00	0.45	0.55	0.19	0.20	0.61
Documents-related barrier						
Not having ID card or Passport	0.10	0.37	0.53	0.31	0.11	0.59
Having an ID card or Passport	0.10	0.35	0.55	0.30	0.16	0.55
Not having payslip	0.10	0.37	0.53	0.29	0.16	0.55
Having a payslip	0.16	0.20	0.65	0.41	0.10	0.49
Not having title deed	0.09	0.35	0.56	0.26	0.17	0.57
Having a title deed	0.11	0.36	0.54	0.33	0.14	0.53
Cost-related barriers						
Low minimum balance is important factor	0.09	0.31	0.61	NA	NA	NA
Low minimum balance is not important	0.10	0.36	0.54	NA	NA	NA
Low interest rate on loans is important	NA	NA	NA	0.31	0.09	0.60
Low interest rate on loans is not important	NA	NA	NA	0.29	0.21	0.50
Financial knowledge-related barrier						
Financial literacy score=0	0.05	0.34	0.62	0.28	0.13	0.59
Financial literacy score=1	0.08	0.34	0.57	0.32	0.16	0.53
Financial literacy score=2	0.12	0.37	0.51	0.30	0.17	0.53
Financial literacy score=3	0.19	0.43	0.38	0.28	0.17	0.56
Psychological-related barrier						

No trust to bank or MFI	0.05	0.49	0.46	0.13	0.16	0.72
Trust to bank or MFI	0.10	0.35	0.56	0.30	0.15	0.55
Strongly trust to bank or MFI	0.11	0.35	0.53	0.34	0.16	0.50
Trust in investing in stock or shares	0.10	0.31	0.60	NA	NA	NA
No trust in investing in stock or shares	0.12	0.43	0.45	NA	NA	NA
It is embarrassing to borrow money or buy on credit	NA	NA	NA	0.28	0.18	0.55
It is not embarrassing to borrow money or buy on credit	NA	NA	NA	0.32	0.13	0.55
People in the community borrow money to manage their lives	NA	NA	NA	0.31	0.16	0.53
People in the community do not borrow money to manage their lives	NA	NA	NA	0.28	0.14	0.58
Financial needs-related barrier						
Enjoying money now is better than saving for the future	0.08	0.44	0.47	NA	NA	NA
Enjoying money now is not better than saving for the future	0.11	0.33	0.57	NA	NA	NA
Possibility to borrow money from the community when needed	NA	NA	NA	0.29	0.18	0.53
Cannot borrow money from the community when needed	NA	NA	NA	0.31	0.13	0.56
Possibility to borrow money from the family when needed	NA	NA	NA	0.29	0.17	0.54
Cannot borrow money from the family when needed	NA	NA	NA	0.31	0.12	0.57
Other determinants						
Female	0.11	0.36	0.53	0.30	0.16	0.54
Male	0.09	0.33	0.58	0.30	0.14	0.56
Single	0.09	0.25	0.66	0.21	0.07	0.72
Married	0.10	0.36	0.54	0.31	0.16	0.53
No formal education	0.06	0.38	0.56	0.28	0.16	0.56
Primary education	0.09	0.35	0.56	0.33	0.15	0.52
Secondary education	0.11	0.36	0.54	0.28	0.16	0.56
Above secondary education	0.17	0.34	0.50	0.20	0.17	0.63
Monthly income less than 60 USD (Q1)	0.06	0.33	0.61	0.28	0.18	0.55
Monthly income between 61 and 135 USD (Q2)	0.07	0.39	0.54	0.27	0.16	0.57
Monthly income between 136 and 350 USD (Q3)	0.10	0.36	0.54	0.32	0.14	0.54
Monthly income higher than 350 USD (Q4)	0.14	0.35	0.52	0.33	0.13	0.54

Use of cell phone	0.10	0.38	0.52	0.30	0.16	0.54
No cell phone	0.10	0.28	0.62	0.29	0.14	0.56
Use of cell phone x Internet	0.13	0.36	0.51	0.30	0.14	0.56
No cell phone or no Internet	0.09	0.35	0.55	0.30	0.16	0.55

From the Table 6, the probability that an individual, who lives just around 5 minutes from the financial institutions, uses formal saving equals 15%[9]. This probability decreases to 9% if their houses are between 5 minutes and 1h 59 from financial institutions, and no one would use this formal service (Probability equals zero) if they need to spend at least 2 hours to reach the nearest financial institutions. Besides the distance, we find that financial literacy is also a main barrier to formal saving usage. For instance, the probability that an individual would use this product equals only 5% if their score for financial knowledge equals 0. It increases to 8% if they score 1, 12% if they score 2 and 19% if they score 3, other things being equal. Next, the trust to financial institutions appear to be another main barrier. If an individual does not trust financial institutions, the probability that they use formal savings equal only 5%, and it doubles if they trust or strongly trust those institutions.

Looking at the credit products, distance is not the barrier to formal credit. Indeed, even though the lowest probability of borrowing from formal financial institutions is among adults who live at least 2 hours away from financial institutions (19%), we find that adults who live just around 5 minutes from the institutions are less likely to borrow from financial institutions (24%) compared to those who live between 5 minutes and 2h (31%). A deeper investigation is still needed to clarify if this correlation is due to the fact that adults who live near financial institutions do not have financial needs or because they are shy to borrow when they are too near their creditors. Similarly, the role of financial literacy is not clear in the case of credit, suggesting to improve the use of formal credit, improving financial literacy is not enough. Nevertheless, the psychological barrier related to trust in financial institutions does have a remarkable impact like the case of savings. Indeed, without trust, the probability that adults take formal credit equals 13% and it increases up to 30% if they trust and 34% if they strongly trust. Next, having a payslip does play a main role in accessing to formal credit as the probability that individuals use formal credit equals 41% if they have payslip against 29% if they haven't.

It is also interesting to note that women in Cambodia are more likely to save than men, either formally or informally. This is partly contrast to the literature because in general, men tend to save formally while women tend to save informally (Ouma et al., 2017). Lastly, education, income and the use of

---

[9] The values of other variables equal to their mean values.

mobile phone with the access to the Internet are also the key determinants of formal savings in Cambodia but their roles to promote formal credit are not evident.

To sum up, we find that the trust to financial institutions is the main barrier to formal financial service usage for both saving and borrowing. The distance to financial institutions and the level of financial literacy are also crucial to improve the access to formal saving, however, it is rather documents-related barrier (payslip, the title deed) that is another key barrier to formal credit usage. This shows that when we analyze the determinants of and barriers to financial inclusion, we need to distinguish the type of financial products/services. In addition, we should also distinguish the group of people who use informal services and those who are financially excluded. For instance, we find that adults who are more sensitive to the costs of credit are more likely to be financially excluded, but if they access to credit, they rather use the formal credit than the informal credit. Therefore, grouping adults who do not use formal financial services in one group could yield bias estimation.

To promote the formal financial inclusion in Cambodia, based on these results, we need to continue restoring people's confidence and trust in financial institutions given that there are still one third of adults who do not trust or just slightly trust in Microfinance Institutions. Maintaining macroeconomic and political stability could be one of the solutions. Continuing promoting financial literacy may also help building people's trust and changing their behavior from saving cash at home to saving in banks or MFI. Improving the physical infrastructure is also important given that the long distance to financial institutions could decrease the probability of formal saving, especially in the rural area providing that 66% of adults must spend at least 30 minutes (25% for more than 1h) to reach the nearest banks or MFI. This barrier could be also overcome by improving the technology, but this also needs a good quality of Internet access across the country and complemented by a high level of financial knowledge. Next, if we are successful to encourage formal savings, it would also help us to reduce the cost of credits-and thus this would promote the formal credit-given that the current low rate of saving in Cambodia induces financial institutions to acquire funds from abroad, which is more costly. Next, providing written employment contracts and payslips would help workers when they want access to formal credit. This result seems to show a relationship between labor market and credit market: People working in informal sector might be less likely to have a pasylip, and thus less likely to have access to formal credit market. Lastly, given that the level of education has a strong impact on the probability of formal savings, and the important role of women in Cambodia's society, we need to keep pushing women to study higher because only 30.6% of female adults in the data have continued their studies until secondary education or above against 44.2% of male adults.

V- Conclusion

This article seeks to find what are the determinants and barriers to financial inclusion in Cambodia. We apply a multinomial logit model to the FinScop survey data conducted in late 2015, which represents the adult population in Cambodia. A key contribution of this article is to distinguish the formal financial inclusion in two different products/services, saving and credit, and at the same time, we also distinguish the group of adults who use informal financial products from those who are financially excluded. Results show that the trust to financial institutions is the main barrier to formal financial inclusion in Cambodia for both saving and borrowing. Other psychological variables such as the trust in investing in the stock or shares and the feeling embarrassed to borrow money, also have some roles in encouraging or discouraging the formal or informal savings/borrowings. Then, the distance to financial institutions and financial literacy are found to play a crucial role in promoting the formal saving in Cambodia, while the obstacles towards the formal credit are rather driven by the costs and documents-related barriers. Besides these barriers, gender, marital status, education, income and the use of mobile phone with the access to the Internet are the key determinants of formal savings in Cambodia as well.

To promote the formal financial inclusion in Cambodia, we need to continue promoting financial literacy among adults and young population, which help them understand the benefits of using formal financial services. Financial literacy may also contribute to building the individual trust towards financial sector in a country that experienced several decades of political and economic instability. With the access, quality and reasonable cost of the Internet service, financial literacy would also help to overcome the physical barrier to formal financial product usage such as the distance to banks or MFI. Reducing the costs of credit and encouraging the provision of payslip to employees would also help adults having higher chances to access to formal credit usage.

We acknowledge, however, that this research still possesses some shortcomings. First, in terms of data, we could not clearly separate individuals who are financially excluded because of the self-exclusion or being rejected when they requested for credits from financial institutions. In addition, we only focused on saving and credit strands, while it is also possible to consider other financial products/services such as remittance and insurance. Second, in terms of method, we did not deal with the problem of endogeneity of some potential variables such as financial literacy, trust to financial institutions and personal income for example. The future research concerning the determinants of and barriers to financial inclusion in Cambodia should try to address these issues.

References

▪ Abu Seman, J., 2016. Financial inclusion: the role of financial system and other determinants (Doctoral dissertation, University of Salford).

▪ Akileng, G., Lawino, G.M. and Nzibonera, E., 2018. Evaluation of determinants of financial inclusion in Uganda. Journal of Applied Finance and Banking, 8(4), pp.47-66.

▪ Atkinson, A. and Messy, F.A., 2013. Promoting financial inclusion through financial education. Bruhn, M. and Love, I., 2014. The real impact of improved access to finance: Evidence from Mexico. The Journal of Finance, 69(3), pp.1347-1376.

▪ Burgess, R. and Pande, R., 2005. Do rural banks matter? Evidence from the Indian social banking experiment. American Economic Review, 95(3), pp.780-795.

▪ Izquierdo, N.C. and Tuesta, D., 2015. Factors that matter for financial inclusion: Evidence from Peru. Aestimatio: The IEB International Journal of Finance, (10), pp.10-31.

▪ Demirgüç-Kunt, A., Honohan, P. and Beck, T., 2008. Finance for all: Policies and Pitfalls in Expanding Access. World Bank.

▪ Fungáčová, Z. and Weill, L., 2015. Understanding financial inclusion in China. China Economic Review, 34, pp.196-206.

▪ Grohmann, A., Klühs, T. and Menkhoff, L., 2018. Does financial literacy improve financial inclusion? Cross country evidence. World Development, 111, pp.84-96.

▪ Honohan, P. and King, M., 2012. Cause and effect of financial access: cross-country evidence from the Finscope surveys. Banking the world: empirical foundations of financial inclusion, pp.45-84.

▪ INFE, O., 2011. Measuring financial literacy: Questionnaire and guidance notes for conducting an internationally comparable survey of financial literacy. Periodical Measuring Financial Literacy: Questionnaire and Guidance Notes for conducting an Internationally Comparable Survey of Financial Literacy.

▪ Lay, S.H., 2018. Mobile Phones and Financial Access: Evidence from the Finscope Surveys of Selected Asian Countries.

▪ Llanto, G.M. and Rosellon, M.A.D., 2017. What Determines Financial Inclusion in the Philippines? Evidence from a National Baseline Survey (No. DP 2017-38).

▪ Llanto, G.M., 2015. Households' access to financial services: some evidence from survey data. Philippine Review of Economics, 52(2), pp.170-191.

▪ Lyons, A., Grable, J. and Zeng, T., 2017. Infrastructure, urbanization, and the financial inclusion of Chinese households.

▪ Narain, S., 2009. Gender and access to finance. The World Bank.

- National Bank of Cambodia, 2017. Annual report.

- Ouma, S.A., Odongo, T.M. and Were, M., 2017. Mobile financial services and financial inclusion: Is it a boon for savings mobilization? Review of development finance, 7(1), pp.29-35.

- Pena, X., Hoyo, C. and Tuesta, D., 2014. Determinants of financial inclusion in Mexico based on the 2012 National Financial Inclusion Survey (ENIF) (No. 1415).

- Shankar, S., 2013. Financial inclusion in India: Do microfinance institutions address access barriers. ACRN Journal of Entrepreneurship Perspectives, 2(1), pp.60-74.

- Soumaré, I., Tchana Tchana, F. and Kengne, T.M., 2016. Analysis of the determinants of financial inclusion in Central and West Africa. Transnational Corporations Review, 8(4), pp.231-249.

- Steiner, S., Giesbert, L. and Bendig, M., 2009. Savings, credit and insurance: household demand for formal financial services in rural Ghana.

- Stiglitz, J.E. and Weiss, A., 1981. Credit rationing in markets with imperfect information. The American economic review, 71(3), pp.393-410.

- UNCDF, 2018. Examining customer journeys at financial institutions in Cambodia.

- Wooldridge, J.M., 2015. Introductory econometrics: A modern approach. Nelson Education.