Factors Affecting Ownership of Financial Products in Colombia

Daisy Johana Pacheco
Ana María Yaruro

Abstract

This paper explores the variables determining why, despite being aware a financial product exists, individuals decide not to include them in their portfolio of products and services. The results for Colombia from the Financial Capabilities Survey in Andean Countries conducted by CAF-Development Bank of Latin America were employed to estimate the dependence between the level of awareness and ownership of financial products, and variables related to respondents' sociodemographic characteristics, such as households' financial skills. It also attempts to measure the level or strength of association between said variables. We use a two-factor contingency table methodology, complemented by loglinear regression models, following that proposed by Agresti (2007). The results show that not having a financial product, despite knowing it exists, is related to low levels of education, income, and not budgeting, among other factors.

Keywords: financial inclusion, financial stability, awareness and ownership of financial products

JEL classification: D10, G20, O10.

1. INTRODUCTION

Financial inclusion is a topic of major interest among public and private institutions, international organizations, and multilateral bodies. According to the World Bank (2014), close to 50 countries have established objectives for financial inclusion, and the World Bank Group, together with a coalition of partners, have made commitments to promote it, setting a principal goal of achieving universal access for adults to the financial system by 2020.

At the international level, one of the agencies most recognized for its work on financial inclusion topics is the Alliance for Financial Inclusion (AFI) created in 2008. The main objective of the AFI is to encourage the interaction and exchange of knowledge among its member countries, with the purpose of making financial services more accessible to individuals excluded from the system. In 2016, the alliance consisted of members from over 90 countries and institutions, including the United Nations, the Bill and Melinda Gates Foundation, and the German Federal Ministry for Economic Cooperation and Development, among others.

The importance of this topic on the global agenda stems from recognition of the positive implications financial inclusion and financial development have for economic growth and productivity (King and Levine, 1993; Levine and Zervos, 1998; Songul, 2011; and Sahay et al., 2015), poverty reduction (Burgess and Pande, 2005), economic inequality (Beck et al., 2007), and the labor market situation (Bruhn and Love, 2014). Moreover, this growing interest has increased as a consequence of the 2007-2008 international financial crisis because it highlighted the importance of the relation between the level of financial inclusion and financial stability (Sahay et al., 2015; Han and Melecky, 2013; Mehrotra and Yetman, 2015).

In the last ten years, the Colombian government has also been committed to promoting financial inclusion in the country. To this end, in 2006 it set up the Programa de Banca de las Oportunidades (Bank of Opportunities Program) and authorized creation of correspondent banks that allowed for increasing the coverage and ownership of financial products among the population. This policy was hailed as a success by government authorities, given that as of 2014 most Colombian towns had at least one point of access and around six million people were using the financial system, surpassing the government's 2010-2014 Development Plan goal.

Based on this policy balance, the government modified its approach at the end of 2014, establishing new guidelines promoting the use of financial and transactional products, financing to small and midsize firms (SMEs) and to the agricultural sector, and improving financial education among the population (Salamanca, 2014). This objective encompasses various regulatory initiatives by the government, including the creation of the Intersectoral Commission for Economic and Financial Education (Decree 457 of 2014),[1] the definition of low amount consumer credit (Decree 2654 of 2014), [2] the authorization of insurance company correspondents (Decree 34 of 2015),[3] the creation and regulation of companies specializing in electronic deposits and payments (Law 1735 of 2014 and Decree 1491 of 2015),[4] and the inclusion of property guarantees as admissible collateral (Decree 466 of 2016).[5]

In addition, the Intersectoral Commission for Financial Inclusion was set up[6] (Decree 2338 of 2015) to coordinate the policies and efforts of public and private institutions and foster financial inclusion in the country. This government effort was highlighted in the Global Microscope 2015, where Colombia is ranked second among a sample of 55 nations when measuring the most enabling regulatory and institutional environment for financial inclusion.

The international and domestic importance of this topic has made it necessary to obtain more specific measures on levels of financial

---

[1] See *Diario Oficial*, year CXLIX, No. 49083, March 5, 2014, <http://www.suin-juriscol.gov.co/viewDocument.asp?id=1104597>.

[2] See *Diario Oficial*, year CL, No. 49368, December 17, 2014, <http://www.suin-juriscol.gov.co/viewDocument.asp?id=1477104>.

[3] See *Diario Oficial*, year CL, No. 49.394, January 14 de 2014, <http://www.suin-juriscol.gov.co/viewDocument.asp?id=30019717>.

[4] See Law núm. 1735, October 21, 2014, <http://wp.presidencia.gov.co/sitios/normativa/leyes/Documents/LEY%201735%20DEL%2021%20DE%20OCTUBRE%20DE%202014.pdf>, and *Diario Oficial*, CL, No. 49572, July 13, 2015, <http://www.suin-juriscol.gov.co/viewDocument.asp?id=30019957>.

[5] See *Diario Oficial*, year CLI, No. 49.818, March 17, 2016, <http://www.suin-juriscol.gov.co/viewDocument.asp?id=30023903>.

[6] The commission will consist of the Ministry of Finance and Public Credit and that of Agriculture and Rural Development, the financial superintendent and the director of the Financial Regulation and Financial Studies Unit, as well as the governors of the Banco de la República and the director of the National Planning Department as special guests.

inclusion among the population. Two approaches stand out for this purpose: one (supply) that considers financial institution data, and another (demand) constructed from household surveys (Roa, 2015). In the case of Colombia, financial institution data finds that 76.3% of adults have at least one financial product, while only 38.4% of people mention having an account at a financial institution, according to a survey of individuals conducted by the World Bank.

The difference between both approaches underlines the need for analyzing not just supply factors, but also those of demand when assessing ownership of formal financial products. The results for Colombia show that supply-side constraints are small: 95% of individuals stated having access to at least one point of contact to the financial system, according to the Demand Survey of Banca de las Oportunidades (BO) and the Financial Superintendency of Colombia (Superintendencia Financiera de Colombia, SFC), while there are also financial products available through simplified procedures whose only requirement is to present an identification document in order to acquire them. This demonstrates that some of the supply barriers mentioned by Karlan et al. (2014), such as regulatory ones or those associated to the costs of having the opportunity to access the financial system, are not significant in explaining the determinants of financial product ownership in Colombia.

Hence, the fact that an individual in Colombia does not have any financial instrument in their portfolio is more associated to sociodemographic characteristics, awareness, and financial attitudes and behaviors that condition their preferences and financial decisions. This is consistent with that found by Bebczuk (2008), who contends that low levels of financial inclusion in Latin America and the Caribbean are mainly associated with demand factors. Furthermore, people may decide not to have financial products for reasons of confidence or social emulation, despite how useful they might be. Karlan et al. (2014) and Roa (2013) have found that other factors such as cognitive capacity and psychological aspects have a significant influence on people's financial behavior, given that they limit their ability to process and interpret the information available.

As shown in the literature review section of this paper, various exercises have been performed in Colombia to measure the influence of sociodemographic factors on financial product ownership. However, these tasks have suffered from limited demand-side data, specially concerning the variable that measure financial attitudes

and behaviors, as well as awareness regarding the supply of said products. The efforts of the OECD in preparing a questionnaire that is comparable across countries (and applied to Andean countries through the CAF) stand out in contributing to this type of research and addressing data limitations.

One of the most important results of the abovementioned survey for Colombia is that 96% of those surveyed are aware of at least one financial product, but only 44.2% mention owning at least one. This difference is the main motivation for this work, which consists of determining the demand factors explaining why individuals decide not to own a financial product, despite knowing it exists. The methodology employed for this objective is that of using contingency tables to determine the dependency of the fact of being aware of, but not owning a financial product with all the possible explicative variables, as well as loglinear estimates for determining the level of association between such variables.

In line with findings for other emerging economies regarding the factors limiting financial inclusion, we find that not owning a financial product in Colombia despite being aware of it is related to low levels of education and income, a vulnerable status in the labor market, not budgeting, and not being directly responsible for money management in the household. The paper is divided into six sections including this introduction. Section 2 reviews the literature. The third section presents the data, while Section 4 describes the methodology used. The paper then gives the most important results and ends with some concluding remarks.

2. LITERATURE REVIEW

Literature on this topic has generally focused on determining the variables that affect the likelihood of usage or access to financial products or services, where the most outstanding factors have been education, income, and age, among others. Several works have also underlined the importance of financial education, behavioral variables, and financial attitudes, as well as psychological aspects.

In the United States, Grimes et al. (2010) employ data from the National Financial Services Survey to show that people with a professional education, are homeowners, have taken a course in economics, business, or finance at college and have knowledge of economic

matters[7] are more likely to be banked, while being young and having a low income make this less likely. For Canada, Simpson and Buckland (2009) show that financial exclusion is related to the levels of income, wealth, education (formal and financial), age, and being a homeowner or not.

Using the Financial Access Survey for Kenya and Uganda, Johnson and Niño-Zarazúa (2009) find that having a job or a main source of income is the most influential variable in access to or exclusion from the financial system in those countries. The authors show that age is also an important variable, although its influence depends on the country. The individuals most likely to be excluded in Kenya are aged between 18 and 24, while in Uganda they are over 45.

In the case of Latin America and the Caribbean, García et al. (2013), based on data from the Global Financial Index Database, demonstrate that having at least one account in the financial system is positively related to income, education, being male, being between 25 and 64 years old, and living in urban areas. Meanwhile, Tuesta et al. (2015) contend that in Argentina the probability of having an account,[8] a credit card, or a debit card increases with education, income, and age, although the effects on the latter variable are degressive. For Mexico, Djankov (2008) finds that bankarization among households is explained by wealth, education, and other unobservable characteristics. In the case of Bolivia, Altunbaş et al. (2010) show that having a university degree or being a civil servant increases the possibility of obtaining a loan from a formal financial intermediary, while being a woman or indigenous reduces it.

For Colombia, the recent works of Rodríguez-Raga and Riaño-Rodríguez (2016), and Gómez et al. (2016) stand out. These authors estimate the determinants of access to and demand for saving and credit products in Colombia, using discrete choice models. In the former paper, the authors employ information from the Colombian Longitudinal Survey (ELCA), while in the latter they take data from the Demand Survey of Banca de las Oportunidades.

---

[7] This variable is constructed from the percentage of correct answers to questions on economics themes. The latter includes concepts such as unemployment rate, inflation, deficit, and central bank functions, among others.

[8] The account may be at a financial institution, cooperative, microfinance company, or post office.

Meanwhile, Rodríguez-Raga and Riaño-Rodríguez (2016) find that the likelihood of having access to saving products in the formal financial system is greater for those who have higher levels of income and education, formal employment, their own home, and access to public services or some type of government assistance program. They also show that access to credit is related to home ownership, living in urban areas, and being older. Similarly, Gómez et al. (2016) demonstrate that the probability of demand for savings accounts is greater among individuals with higher levels of education and income, who are beneficiaries of some type of government program, and have formal employment, confidence in the financial system, and at least one insurance policy. In the case of demand for loans, these authors show that the probability is higher among individuals over the age of 46, and who have formal employment and confidence in the financial system.

In addition, Cano et al. (2013), based on the Financial Capabilities Survey of the World Bank and the Banco de la República, calculate the determinants of access to a basket of financial products, assuming that the more products a household has, the more likely it is to use them effectively. Through multiple correspondence analysis, the authors find that access to different baskets of financial products is associated to variables such as sex, levels of income and wealth, schooling, and level of financial education, household stability, and distance between dwellings and financial branches, as well as the assessment of the future in financial decisions and attitudes.[9]

The work of Murcia (2007) finds the determinants of access to mortgage credit and credit cards for Colombian households, based on data from the Quality of Life Survey of the National Administrative Department of Statistics (DANE). Using a probit model, the author determines that the likelihood of having access to credit depends on income or wealth, years in education, and geographic location. The sex of the household head was found to be significant in the case of mortgage credit, but not in that of credit cards.

---

[9] According to this paper, households' financial attitudes are related to their capacity to learn from the money management mistakes of others, trying to save money for the future or for emergencies and doing so regularly, making long-term plans, and obtaining information for making financial decisions.

Finally, Meza et al. (2008) show that when people assess the benefits and risks of owning financial products, the most important variable is their personal experience or those of their friends. Moreover, Martin (2007) finds that people's financial behaviors, such as acquiring financial saving products, establishing a budget, and paying obligations on time, mainly depend on their degree of risk aversion, capacity to tackle problems, and financial literacy. On the latter points, Roa (2013) highlights how it is essential to consider that the acquisition and usage of financial data is influenced by the psychological traits of individuals, such as cognitive biases, confidence and conformity, and bounded rationality, among others.

3. DATA DESCRIPTION

This section of the paper presents a description of the data used for estimating the factors influencing ownership of financial products in Colombia. The principal source of our dataset is the Financial Capabilities Survey in Andean Countries (Bolivia, Colombia, Ecuador, and Peru) developed by the Organization for Economic Cooperation and Development (OECD) and funded and sponsored by the CAF-Development Bank of Latin America through the Asociación Solidaridad Países Emergentes. The survey was prepared with the aim of performing a diagnosis to identify the knowledge, skills, attitudes, and behaviors of individuals in different countries relative to some financial topics and various aspects of financial education, such as budgeting, money management, short- and long-term financial planning, and choosing financial products.

The questionnaire was designed in 2011 by the International Network on Financial Education of the OECD to be used in face-to-face or telephone interviews and consists of practical questions taken from existing financial education surveys. Thus, the survey is made up of different modules containing questions related to specific themes divided as follows: location, general information on the household, the household economy, financial products, behaviors and attitudes to money, evaluation of concepts, education and employment data, and general information about the respondent.

Given the objective of performing an analysis of the determinants of financial product ownership in Colombia, we only employ results of the survey for that country, which was conducted towards the end

of 2013 among a sample of 1,261 individuals over the age of 18 from all socioeconomic levels. The sample is nationally representative and covers 23 areas of the country, including Bogotá.

Given that some answers were initially consolidated in different ways (for example, a multiple-choice question could be assigned to just one or several variables depending on the number of options it contained), variables needing some type of treatment were transformed to make them easier to handle for the estimations. Some additional count or summary variables were also created (such as the number of financial products known, and the number of correct answers in the concept assessment module, among others).

3.1 Descriptive Statistics of the Survey

In general terms, the individuals surveyed mostly belong to mid-size and large urban areas. The majority of respondents are also women (53.5%) and aged 18 to 29 (27.0%). A summary of some of the most important sociodemographic variables in the study is presented in Annex 1.

As for awareness of financial products, 54.3% of those surveyed are familiar with between three to eight financial products. With regard to financial product ownership, 79% mention owning just one or none. From these results therefore raises interest in finding the factors that determine why respondents, even though they are aware of financial products, do not own them. This question was used as the basis to create variable Y (awareness and ownership condition) that we want to explain as a multinomial variable that takes the value 1 if the individual is aware of at least one financial product, but does not own any (AandNo), 2 if the individual is aware of at least one product and owns at least one (AandO) and 3 if the individual is not aware of any financial products (and therefore does not own any, NA). The latter is explained by the way in which the survey was conducted, given that if respondents state not knowing any financial product they do not answer the following questions in the ownership and usage modules. Upon analyzing the distribution of variable Y, we find that 44.3% of the data takes the value 1 (aware of and do not own), 51.4% take the value 2 (aware of and own), while the remaining 4.3% belongs to category 3 (not aware of).

4. METHODOLOGY

Based on the findings in the second section of this paper, the methodology most commonly used when attempting to determine factors associated to a behavior or individual situation (ownership or usage of financial products) is that related to probit and logit models. Nevertheless, when all the explicative variables are categorical, as is the case with the data employed in this work, it is useful to employ contingency tables to perform tests of independence, and loglinear models to determine the degree of association between the variables considered, in accordance with that proposed by Agresti (2007).

4.1 Contingency Table Analysis

Contingency table analysis, besides performing exploratory analysis, estimates joint distributions of variables of interest and performs measures of association that describe the dependence between two random binomial or multinomial variables. This paper uses basic two-way contingency tables (I^*J), where it is assumed that each n_{ij} in table x represents the number of subjects that have the following characteristics $(Y=i, Z=j)$, and n_{i+}, n_{+j} are the marginal totals of rows and columns, respectively:

	Z=1	Z=2	Total
Y=1	n_{11}	n_{12}	n_{1+}
Y=2	n_{21}	n_{22}	n_{2+}
Total	n_{+1}	n_{+2}	n_{++}

Assuming that the observations result from a random sampling process, table $x = (n_{11}, n_{12}, n_{21}, n_{22})$ will have a multinomial distribution with a vector parameter:

$$\pi = \left(\pi_{11}, \pi_{12}, \pi_{21}, \pi_{22} \right) = \left\{ \pi_{ij} \right\}, \qquad \boxed{1}$$

where $\pi_{ij} = P(Y = i, Z = j)$ corresponds to the probability of an individual randomly selected from the population of interest belonging

to cell (i,j)-*th* of the contingency table. Annex 2 shows an example of a contingency table analysis application.

After performing the exploratory analysis procedure for the data, the hypothesis we wish to assess is the independence between the explicative and dependent variables. These tests were performed for all the variables of the survey in order to study the possible influence of all the dimensions measured in the survey: sociodemographic characteristics, household economy data, behaviors and attitudes to money, and concept assessments.

4.2 Estimation Method

The variable to explain in this paper is defined as multinomial, in which the response of each individual is independent and the probability for the three categories is the same. Hence, the number of possible categories is denoted as c with their respective probabilities $\{\pi_1, \pi_2, \ldots \pi_c\}$, where $\Sigma_j \pi_j = 1$. For n independent observations, where $\Sigma_j n_j = n$, the likelihood that n_1 falls into category 1, n_2 into category 2, ..., n_c into category c is equal to

2
$$P\left(n_1, n_2, \ldots, n_c\right) = \left(\frac{n!}{n_1! \, n_2! \ldots n_c!}\right) \pi_1^{n_1} \pi_2^{n_2} \ldots \pi_c^{n_c}.$$

In practice, the parameter values of the distribution are unknown. In this case, the parameter of the multinomial distribution we want to estimate corresponds to the probability value of each category: π_j. The estimation method most used for these estimations is that of maximum likelihood, which guarantees optimal properties for the estimators, and uses the likelihood function as an input defined as the probability of observed data according to the parameter. In the multinomial case, the likelihood function is written as:

3
$$L\left(\pi_1, \pi_2, \ldots \pi_c\right) = C\pi_1^{n_1} \pi_2^{n_2} \ldots \pi_c^{n_c} = C\prod_{j=1}^{c} \pi_j^{n_j} = C\left(\pi_j\right)^{\sum_{j=1}^{c} n_j},$$

where C is a constant equal to $\left(\dfrac{n!}{n_1! n_2! \ldots n_c!}\right)$.

The objective with this function is therefore to find the scenario that maximizes the probability of the event that has occurred. Most of the times this methodology is employed, a transformation of the likelihood function is carried out in order to make it easier to calculate the points at which said function is maximized. Hence, the log-likelihood function is denoted as:

$$l\left(\pi_1, \pi_2, \ldots \pi_c\right) = \left(\sum_{j=1}^{c} n_j\right) \ln \pi_j.$$

$\boxed{4}$

Deriving 4 with respect to π_j and setting equal to zero gives the estimated parameter as:[10]

$$\hat{\pi}_j = \frac{n_j}{n}.$$

$\boxed{5}$

Similar to what occurs in the multinomial distribution, for observed data we find that $\hat{\pi}_{ij} = n_{ij}/n$, which corresponds to the joint probability for both variables Y and Z, and becomes the parameter of interest for the estimations.

After finding the explicative variables that are dependent on the variable of interest, and defining the assumed distribution of the latter, the next step is to estimate by survey modules the effects of the explicative variables on the behavior of the variable of interest. The explicative variables employed were selected from the stepwise models of each group. This was carried out considering the high degree of multicollinearity among the variables, and with the aim of seeking the best adjustment of the variables chosen per topic. The estimation is made by using generalized linear models, specifically through the use of loglinear regressions that quantify the level of association and interaction between two categorical variables (explicative and dependent). This level of association is constructed based on odds ratios resulting from estimating the expected values of the contingency table cells.

Given that there is no linear relation between the dependent variable and the explicative ones, as takes place in linear regression

---

[10] For further details see Agresti (2007), p. 21.

models, the results of the estimations do not exhibit the direct effects of any variable on that, but model expected frequencies $\hat{\mu}_{ij}$ instead.

The structure of the model is defined depending on whether it is based on the independence assumption or not, in the former case the model is written as follows:

6
$$\mu_{ij} = n\pi_{i+}\pi_{+j}.$$

Taking the natural log on both sides of 6:

7
$$\log(\mu_{ij}) = \log(n) + \log(\pi_{i+}) + \log(\pi_{+j}),$$

8
$$\log(\mu_{ij}) = \lambda + \lambda_i^A + \lambda_j^B.$$

In the no independence case, the representation would be:

9
$$\log(\mu_{ij}) = \lambda + \lambda_i^A + \lambda_j^B + \lambda_{ij}^{AB},$$

where A and B denote the two categorical variables; λ represents the general effect of expected frequencies; λ_i^B represents the principal effect of variable A; λ_j^B represents the principal effect of variable B; and λ_{ij}^{AB} represents the interaction or association between the variables and indicates there is no independence between them.

By modelling expected frequencies, we obtain the parameters that allow for constructing odds ratios that will show the levels of association between the categorical variables being compared. Specifically, the interaction term λ_{ij}^{AB} will allow this measure to be constructed. Thus, by taking

10
$$exp^{\lambda_{ij}^{AB}}$$

we obtain the odds ratio between the explicative variable and the variable of interest. Annex 4 shows the estimation results, in which values λ_{ij}^{AB} (estimate) are found for each regression and their associated $exp^{\lambda_{ij}^{AB}}$ (exp. [coefficients]).

5. RESULTS

This section presents some of the results obtained from the tests of independence between the variable of interest and all possible explicative variables, as well as levels of association between them. Annex 3 of this paper provides a list of the explicative variables for which a test of independence was conducted with respect to variable *Y*, together with the corresponding results.

First, mosaic plots (Figure 1) are presented that show the strength of dependence, if it exists, between two categorical variables. The Y axis of the plots represents the variable of interest in the model (1 if the individual is aware of at least one financial product but does not own any, 2 if the individual is aware of at least one product and owns at least one, and 3 if the individual is not aware of any financial product). The X axis shows the variable found to be relevant for analysis and its different categories. Blue indicates that there is a higher number of frequencies in that category than the model expected, while red means that the number of frequencies in that category is smaller than the model anticipated.

Hence, in the first case studied we find that there are more individuals who do not save and who are aware of but do not own financial products than anticipated by the model. Likewise, we find that there are fewer individuals than expected by the model who did not mention the no saving option (option 2 of variable X) and that are aware of but do not own at least one financial product.

As can be seen, marital status and age do not appear to exhibit dependence with the variable of interest, given that the figures show the test of independence is not significant. This is reflected by grey in most of the figure. On the contrary, having a budget or being responsible for making the financial decisions of the household do seem to be related to the decision on whether to own a financial product or not when an individual is aware of it.

Thus, education, employment status and income exhibit some level of dependence with awareness and ownership of financial products. The tests of independence results show that there is a larger number of people than anticipated by the model with between primary and incomplete high school education, individuals dedicated to household tasks, and with a monthly income of under 400,000 Colombian pesos (COP) who are aware of, but do not own financial products. Meanwhile, the tests show that there is a smaller number
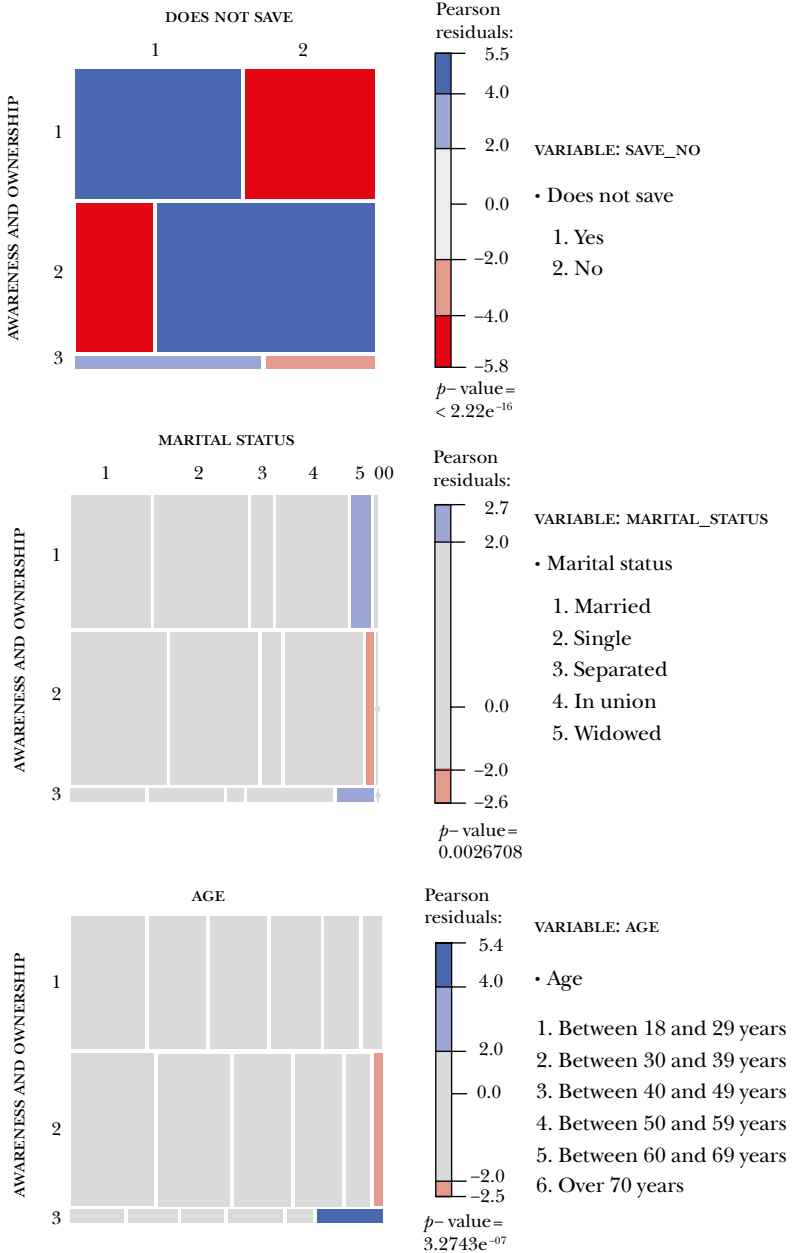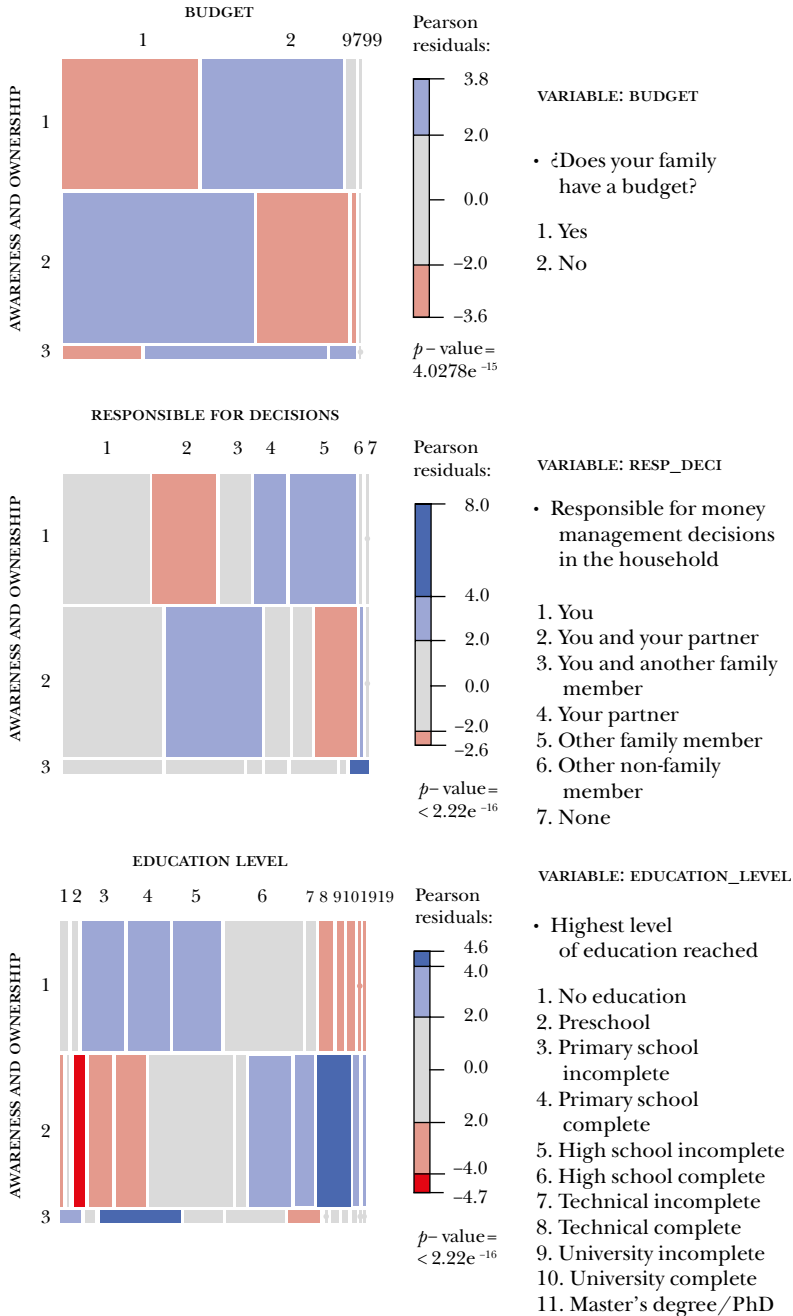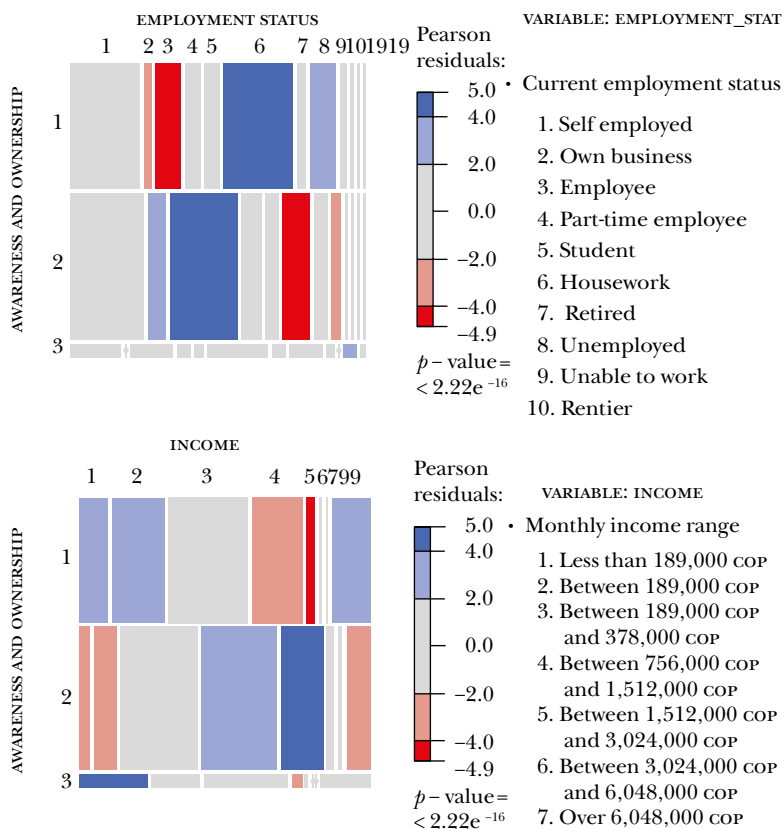
Figure 1

RESULTS OF THE TESTS

DOES NOT SAVE

AWARENESS AND OWNERSHIP

Pearson residuals:
5.5
4.0
2.0
0.0
−2.0
−4.0
−5.8

VARIABLE: SAVE_NO

• Does not save

1. Yes
2. No

p−value= < 2.22e^{-16}

MARITAL STATUS

AWARENESS AND OWNERSHIP

Pearson residuals:
2.7
2.0
0.0
−2.0
−2.6

VARIABLE: MARITAL_STATUS

• Marital status

1. Married
2. Single
3. Separated
4. In union
5. Widowed

p−value= 0.0026708

AGE

AWARENESS AND OWNERSHIP

Pearson residuals:
5.4
4.0
2.0
0.0
−2.0
−2.5

VARIABLE: AGE

• Age

1. Between 18 and 29 years
2. Between 30 and 39 years
3. Between 40 and 49 years
4. Between 50 and 59 years
5. Between 60 and 69 years
6. Over 70 years

p−value= 3.2743e^{-07}

Figure 1 (cont.)

RESULTS OF THE TESTS

VARIABLE: BUDGET

- ¿Does your family have a budget?

1. Yes
2. No

$p-\text{value} = 4.0278e^{-15}$

VARIABLE: RESP_DECI

- Responsible for money management decisions in the household

1. You
2. You and your partner
3. You and another family member
4. Your partner
5. Other family member
6. Other non-family member
7. None

$p-\text{value} = < 2.22e^{-16}$

VARIABLE: EDUCATION_LEVEL

- Highest level of education reached

1. No education
2. Preschool
3. Primary school incomplete
4. Primary school complete
5. High school incomplete
6. High school complete
7. Technical incomplete
8. Technical complete
9. University incomplete
10. University complete
11. Master's degree/PhD

$p-\text{value} = < 2.22e^{-16}$

EMPLOYMENT STATUS

VARIABLE: EMPLOYMENT_STAT

· Current employment status

1. Self employed
2. Own business
3. Employee
4. Part-time employee
5. Student
6. Housework
7. Retired
8. Unemployed
9. Unable to work
10. Rentier

INCOME

VARIABLE: INCOME

· Monthly income range

1. Less than 189,000 cop
2. Between 189,000 cop
3. Between 189,000 cop
   and 378,000 cop
4. Between 756,000 cop
   and 1,512,000 cop
5. Between 1,512,000 cop
   and 3,024,000 cop
6. Between 3,024,000 cop
   and 6,048,000 cop
7. Over 6,048,000 cop

of people than expected by the model with levels of education above university and with income between cop 800,000 and cop 3 million who are aware of, but do not own financial products.

After having found the dependence relations between explicative variables and the variable of interest, we proceeded to perform estimations with those that were significant within each section of questions. Annex 4 of this paper shows the regressions performed, as well as the transformations of λ_{ij}^{AB} coefficients that allow odds ratios to be constructed. It should be mentioned that each model estimation produces validity test results indicating whether the model is properly adjusted. Although these results are not included in Annex 4, they prove the models are properly adjusted. Below are the most outstanding results on the determinants of why a Colombian who is

aware financial products exist decides not to own any, as well as the contribution in terms of the likelihood of the occurrence.

In line with that highlighted in Figure 1, being aware of a financial product but not owning any is related to low levels of education among the respondents, being more frequent among those who did not complete high school education. That is, those without education or with just preschool, incomplete and complete primary school, and incomplete high school education. After complete high school education, a positive contribution is observed on the probability of being aware of and owning financial products. Said probability is 5.0% and 4.2% in the case of completed high school and incomplete technical education respectively, and continues to be positive and much larger for the following levels of education (complete technical, incomplete and complete university, postgraduate), being 15.1% on average. This relation might be attributable to the fact that education provides the individuals with the tools and knowledge necessary to understand the benefits associated with the acquisition of financial products.

On the other hand, the condition of being aware of and not owning any financial products is related to not budgeting and not being directly responsible for money management in the household. Hence, it can be seen how the probability of being aware of and owning financial products among those who do not budget is 0.45 times that of those who do. Said probability among respondents who delegate money management in the household to their partner or another person is 0.5 times that of those who manage it directly. The aforementioned factors reflect the importance of financial behavior when assessing the likelihood of owning a product. In light of this, and considering that the assessment of concepts such as inflation and compound interest were not significant variables, it is essential that education programs implemented in Colombia place emphasis on households' economic behavior. The latter is backed by recommendations made by the World Bank (2013) for improving financial capacities in Colombia, based on the results of the national survey on financial behaviors, attitudes, and literacy.

Meanwhile, not owning financial products despite being aware of them is related to the lowest sociodemographic strata, being amongst the two lowest income ranges, and being unemployed, unable to work, or dedicated to housework. With respect to socioeconomic strata, it can be seen that belonging to strata 4, 5, and 6 increases the

likelihood of being aware of and possessing financial products by 2.9 percentage points (pp), 2.8 pp and 5.1 pp, in that order. In contrast to that expected, this probability is positive for stratas 2 and 3, although its average level is just 1.6%. As for employment status, it is worth mentioning that being a business owner and having at least one employee increases the probability by 2.3 pp of being aware of and owning financial products, while being a full-time employee does so by 2.5 pp. This result is consistent with several of the works mentioned in Section 2, which demonstrate the importance of job security and stability as a determinant of financial inclusion.

Finally, it should be highlighted that, with respect to the marital status of respondents, being widowed is the only variable that affects ownership of a product, while sex and age do not appear to have a significant relation with nonownership, despite being aware. Nevertheless, analyzing the estimated probabilities of being aware of and owning at least one financial product, we find that being a woman and over the age of 60 decreases said likelihood. This might be explained by the fact that a significant proportion of women in Colombia have no income of their own to allow and encourage them to demand financial products.

6. CONCLUSIONS

Identification of the factors that influence the ownership of financial products in any economy has been considered highly important given the positive effects such behavior has on financial stability and, thereby, on economic growth and development. There is ample international recognition regarding the importance of performing studies that measure not only levels of usage and access to financial products, but also determinants related to the decision to access the financial system or remain outside it. With this objective in mind, we used the results of the Financial Capabilities Survey in Colombia, conducted in 2013, to find the factors explaining why even when individuals are aware of financial products they do not own them.

This topic is of great interest for the country because the results of the survey show 44.2% of respondents who mention being aware of at least one financial product do not own any. It is important to mention that this behavior might be associated with supply and demand determinants, but since every town in Colombia has at least

Figure 2

**DISTRIBUTION OF THE VARIABLE OF INTEREST
AND EXPLICATIVE VARIABLES (FRECUENCY)**

LEVEL OF EDUCATION

■ **Awares and does not own**   ■ **Awares and owns**   ■ **Does not aware**

BUDGETING

■ **Awares and does not own**   ■ **Awares and owns**   ■ **Does not aware**

STRATA

■ **Awares and does not own**   ■ **Awares and owns**   ■ **Does not aware**

EMPLOYMENT STATUS

Bar chart showing employment status with three categories: Awares and does not own, Awares and owns, Does not aware.

	Awares and does not own	Awares and owns	Does not aware
Self employed	153	186	11
Own business	16	45	0
Employed	59	178	9
Part time employee	35	49	3
Student	31	36	2
Housework	158	69	13
Retired	17	33	3
Unemployed	61	34	7
Unable to work	15	5	2
Renter	5	4	0
Other	7	6	3
No response	2	3	1

■ **Awares and does not own** ■ **Awares and owns** ■ **Does not aware**

RESPONSIBLE FOR FINANCIAL DECISIONS

Bar chart showing responsibility for financial decisions with three categories.

	Awares and does not own	Awares and owns	Does not aware
You	172	226	19
You and your partner	130	223	15
Your partner	58	58	3
Other family member	63	43	4
Other non-family member	133	96	9
None	3	2	1
Does not know	0	0	3

■ **Awares and does not own** ■ **Awares and owns** ■ **Does not aware**

Factors Affecting Ownership of Financial Products in Colombia   **177**

Figure 2 (cont.)

**DISTRIBUTION OF THE VARIABLE OF INTEREST
AND EXPLICATIVE VARIABLES (FRECUENCY)**

INCOME

■ Awares and does not own   ■ Awares and owns   ▪ Does not aware

MARITAL STATUS

■ Awares and does not own   ■ Awares and owns   ▪ Does not aware
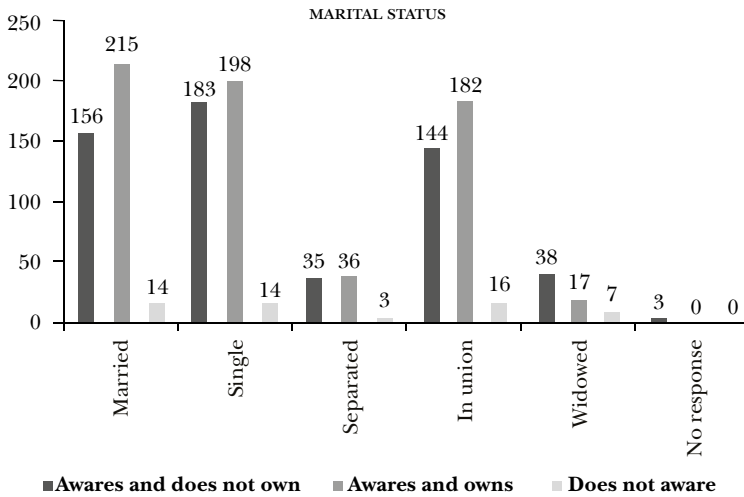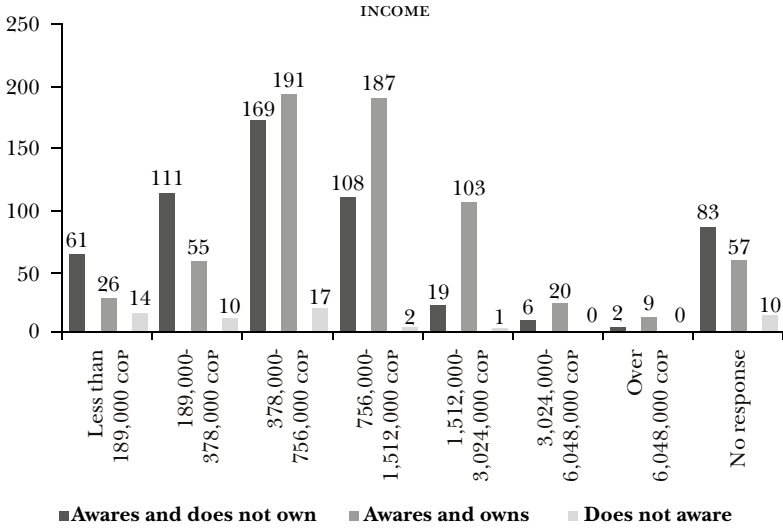
Source: Financial Capabilities Survey-CAF; own calculations.

one access point and there are simplified financial products available, it is assumed the factors explaining nonownership of financial products are related to individuals' sociodemographic characteristics, and their preferences, attitudes, and behaviors.

The estimation methodology that uses contingency tables and loglinear models is an appropriate approach given the nature of the variables it uses, all of which are categorical. This type of model enables dependence relations to be established between the variable of interest and different covariables associated to household sociodemographic themes, attitudes, and financial behaviors, among others.

In particular, we find that individuals with higher than secondary education (high school) are more likely to be aware of and own a financial product than those without education. This confirms the outcomes found by various research papers, underlining how education continues to be important for promoting financial inclusion.

In addition, being in low income ranges and not having a stable source of income is related to nonownership of financial products, which highlights the importance of continuing to make progress in efforts to foster formal employment. In contrast, a high socioeconomic stratum increases the probability of being aware of and possessing financial products. Furthermore, the variables of sex and age do not appear to have a significant relation with the fact of not having any financial product when being aware of at least one.

With respect to some financial behaviors, such as not budgeting and not being responsible for household decisions, we find that this type of individual is more reluctant to have financial products when they are aware of them. It is therefore not only important to promote secondary education, but also financial education programs that place emphasis on the household economy, which has been shown to be one of the main conditioning factors for improving financial capacities in Colombia.

The results of this study support those found in the research work mentioned in Section 2 of this paper, given that they not only underline the importance of sociodemographic variables such as income and education, but also those associated to financial behaviors. In the same way, this paper represents a step towards understanding why Colombians decide not to own financial products despite being aware of them. Going forward, and with more available information, it will be possible to delve deeper into the significance of variables associated to individuals' biases and preferences. The promotion of

these studies continues being of particular interest to the country because they can help establish the factors that should be regarded as important for elaborating policies that encourage ownership of financial products in Colombia, and thereby increase levels of financial inclusion and all the benefits this implies for financial stability and economic growth. Finally, it is important to emphasize that policies implemented to improve levels of financial inclusion should be comprehensive, and strive to address aspects of both supply and demand.

ANNEX

Annex 1

Figure A.1

PRINCIPAL DESCRIPTIVE STATISTICS OF THE SURVEY

AREA

	260	258	348	395
	Rural	Small urban	Midsize urban	Large urban

SEX

	586	675
	Male	Female

LEVEL OF EDUCATION

No education	Preschool	Primary incomplete	Primary complete	High school incomplete	High school complete	Technical incomplete	Technical complete	University incomplete	University complete	Master's degree/PhD	No response
24	15	138	157	186	382	39	141	60	105	11	3

REGION

Region	Value
Bogota	178
Caribbean	283
Central	279
Eastern	197
Pacific	224
South-eastern	100

AGE

Age	Value
18 - 29	341
30 - 39	275
40 - 49	242
50 - 59	341
60 - 69	127
Over 70	67

MARITAL STATUS

Marital Status	Value
Married	385
Single	385
Separated	74
In union	342
Widowed	62
No response	3

AWARENESS

Number of products known

OWNERSHIP

Number of products owned

AWARENESS AND OWNERSHIP

Source: Financial Capabilities Survey-CAF; own calculations.

Annex 2

One application of contingency table analysis illustrated by Agresti (2007) classifies individuals according to sex and opinions on life after death:

	BELIEF IN AFTERLIFE		
Sex	*Yes*	*No*	*Total*
Women	$n_{11} = 509$	$n_{12} = 116$	$n_{1+} = 625$
Men	$n_{21} = 398$	$n_{22} = 104$	$n_{2+} = 502$
Total	$n_{+1} = 907$	$n_{+2} = 220$	$n_{++} = 1127$

It can be seen that out of all the women, 509 said they believed in life after death and 116 said they did not. Based on these initial results the question of interest would be whether sex has any relation with belief in afterlife or not, whether it is more likely that a determined sex says they believe, or whether, on the contrary, sex does not have any relation with this belief.

Annex 3. Tests of Independence

Segment	No	Img_credit_line	Yes
Sex	No	Img_pension_fund	No
Question_division	No	Img_friends	Yes
Question_inflation	No	Img_collective_funds	Yes
Question_interest	No	Img_informal_moneylender	No
Question_simple_interest	No	Img_personal_loan	No
Question_compound_interest	No	Img_credit_cared	No
Question_investment_loss_relation	No	Img_sales	No
Question_inflation_cost_living	No	Img_other	Yes
Question_investment_diversification	Yes	Img_no_answer	Yes
Question_deposit_insurance	No	Img_not_applicable	No
Save_home	Yes	Area	No

Save_chains	No	Region	No
Save_investment	Yes	Marital_status	No
Save_family	No	Under_18	Yes
Save_acccounts	No	Over_18	Yes
Save_fixed_term_deposits	No	Responsible_decisiones	No
Save_frequent_accounts	No	Budget	No
Save_property	Yes	Carefully_consider_when_buying	No
Save_no	No	Live_day_to_day	No
Save_no_answer	Yes	Spend_today	No
Ps_families_in_action	No	Pay_on_time	No
Ps_united_network	Yes	Risk_for_investing	No
Ps_opportunities_bank	Yes	Monitor_financial_topics	No
Ps_agricultural_program	Yes	Financial_goals	No
Ps_agricultural_safe_income	Yes	Money_to_spend	No
Ps_incora	Yes	Income_minus_expenses	No
Ps_lands_adaptation	Yes	Time_income_cover_expenses	No
Ps_productive_alliances	Yes	Cellphone_payments	No
Ps_pademer	Yes	Education_level	No
Ps_rural_women	No	Employment_status	No
Ps_rura_youths	Yes	Stable_income	No
Ps_credit_investment_mechanism	Yes	Income	No
Ps_price_subsidies	Yes	Age	No
Ps_productive_training	Yes	Strata	No
Ps_housing_subsidies	Yes	Budget_specific_plan	No
Ps_other	Yes	Budget_comply_frequently	No
Ps_none	No	Product_choice	No
Ps_not-know	Yes	Deposit_insurance_amount	No
Ps_no_answer	Yes	Professional_fees_receipt	No
Img_pawn	No	Employment_benefits	No
Img_extra_work	Yes	#products_known	No
Img_overdraft	Yes	#method_of_saving	No
Img_mortgage	Yes	#social_programs	No
Img_employer_loan	Yes	#products_owned	No
Img_arrears	Yes	#products_choice	No
Img_reduce_expenses	Yes	#informal_sources	No
Img_save	No	#methods_cover_expenses	Yes
Img_ask_for_credit	No	#correct_answers	No

Annex 4. Regression Results

Explicative variable			Estimation	exp (coefficients)
Sex	CyT	Female	$(0.33)^b$	0.72
Inflation question	CyT	No	$(0.58)^a$	0.56
Simple interest question	CyT	No	$(1.26)^a$	0.28
Investment-loss question	NC	False	1.46^a	4.29
Savings in current or saving accounts	CyT	No	$(2.47)^a$	0.08
Savings in fixed-term deposits	CyT	No	$(4.10)^a$	0.02
Savings by making deposits	CyT	No	$(2.44)^a$	0.02
Does not save	CyT	No	1.27^a	3.55
Uses savings when income is less than expenditures	CyT	No	$(1.02)^a$	0.36
Asks for credit when income is less than expenditures	CyT	No	0.51^c	1.67
Uses pension fund when income is less than expenditures	CyT	No	$(1.57)^a$	0.21
Uses credit when income is less than expenditures	CyT	No	$(1.22)^b$	0.29
Region	CyT	Caribbean	$(1.03)^a$	0.36
		Central	$(0.88)^a$	0.42
		East	$(0.49)^c$	0.61
		Pacific	$(0.92)^a$	0.40
		South-East	$(0.82)^b$	0.44
Marital status	CyT	Single	$(0.24)^d$	0.79
		Widowed	$(1.13)^a$	0.32

Responsible for household decisions	CyT	You and your partner	0.27 [d]	1.31
		Your partner	(0.66)[b]	0.52
		Other family member	(0.60)[a]	0.55
Budget	CyT	No	(0.78)[a]	0.46
	NC	No	0.76[c]	2.14
Level of education	CyT	High school complete	1.62[b]	5.04
		Technical incomplete	1.44[c]	4.21
		Technical complete	2.55[a]	12.85
		University incomplete	2.75[a]	15.67
		University complete	2.82[a]	16.80
	NC	High school complete	(1.78)[c]	0.17
Employment status	CyT	Own business	0.84[b]	2.31
		Employed	0.91[a]	2.48
		Home	(1.02)[a]	0.36
		Unemployed	(0.78)[b]	0.46
		Unable to work	(1.29)[c]	0.27
Income	CyT	From 378,001 cop to 756,000 cop	0.98[a]	2.65
		From 756,001 cop to 1,512,000 cop	1.40[a]	4.06
		From 1,512,001 cop to 3,024,000 cop	2.54[a]	12.72

Explicative variable			Estimation	exp (coefficients)
		From 3,024,001 COP to 6,048,000 COP	2.06[a]	7.82
		More than 6,048,000	2.36[b]	10.56
	NC	From 189,001 COP to 378,000 COP	(0.94)[c]	0.39
		From 378,001 COP to 756,000 COP	(0.82)[c]	0.44
		From 756,001 COP to 1,512,000 COP	(2.52)[b]	0.08
Strata	CyT	2	0.27[c]	1.31
		3	0.58[a]	1.78
		4	1.06[a]	2.89
		5	1.01[c]	2.76
		6	1.63[c]	5.12
Comply with their budget	CyT	Sometimes	0.78[c]	2.18
		Never	0.75[a]	2.11
Receives employment benefits	CyT	No	(1.38)[a]	0.25
Number of social programs	CyT	1	(0.52)[a]	0.59
Age	CyT	60-69	(0.53)[c]	0.59
		Over 70	(0.82)[b]	0.44
	NC	Over 70	1.60[a]	4.94

Note: levels of significance, [a] 0.001, [b] 0.01, [c] 0.05 and [d] 0.1, respectively.

References

Agresti, A. (2007), *An Introduction to Categorical Data Analysis*, Wiley Series in Probability an Statistics, University of Florida/Wiley-Interscience a John Wiley and Sons Publication, 2nd ed., 372 p., <https://mregresion.files.wordpress.com/2012/08/agresti-introduction-to-categorical-data.pdf>.

Altunbaş, Y., J. Thornton, and A. Kara (2010), *What Determines Financial Exclusion? Evidence from Bolivian Household Data*, Working Paper, No. 18, Bangor Business School.

Banca de las Oportunidades y Superintendencia Financiera de Colombia (2015), *Reporte de Inclusión Financiera*, <http://www.bancadelasoportunidades.com/contenido/contenido.aspx?conID=921&catID=1&pagID=1759>.

Banca de las Oportunidades, Superintendencia Financiera de Colombia e Ipsos (2015), *Estudio de demanda para analizar la inclusión financiera en Colombia: informe de resultados.*

Bebczuk, R. (2008), *Financial Inclusion in Latin America and the Caribbean: Review and Lessons,* Working Paper, No. 68, CEDLAS.

Beck, T., A. Demirgüç-Kunt, and R. Levine (2007), "Finance, Inequality and the Poor," *Journal of Economic Growth,* Vol. 12, No. 1, March, pp. 27-49, <http://siteresources.worldbank.org/DEC/Resources/Finance_Inequality_and_the_Poor.pdf>.

Bruhn, M., and I. Love (2014), "The Real Impact of Improved Access to Finance: Evidence from Mexico," *The Journal of Finance,* Vol. 69, No. 3, pp. 1347-1376, <DOI: 10.1111/jofi.12091>.

Burgess, R., and R. Pande (2005), "Can Rural Banks Reduce Poverty? Evidence from the Indian Social Banking Experiment," *American Economic Review*, Vol. 95, No. 3, pp. 780–795, <DOI: 10.1162/jeea.2005.3.2-3.268>.

Cano, C., M. Esguerra, N. García, J. Rueda, and A. Velasco (2013), *Acceso a servicios financieros en Colombia*, Borradores de Economía, No. 776, Banco de la República de Colombia.

Djankov, S., P. Miranda, E. Seira, and S. Sharma (2008), *Who are the Unbanked?*, Policy Research Working Paper, No. 4647, The World Bank.

García, N., A. Grifoni, J. López, and D. Mejía (2013), *La educación financiera en América Latina y el Caribe. Situación actual y perspectivas*, Serie Políticas Públicas y Transformación Productiva, No.12, Banco de Desarrollo de América Latina, <https://www.oecd.org/daf/fin/financial-education/OECD_CAF_Financial_Education_Latin_AmericaES.pdf>.

Gómez, J., J. Jaramillo, and A. Meissel (2016), *El uso de efectivo y tarjetas débito y crédito en Colombia*, Borradores de Economía, No. 950, Banco de la República de Colombia.

Grimmes, P., K. Rogers, and R. Campbell (2010), "High School Economic Education and Access to Financial Services," *The Journal of Consumer Affairs*, Vol. 44, No. 2, pp. 317-335.

Han, R., and M. Melecky (2013), *Financial Inclusion for Financial Stability: Access to Bank Deposits and the Growth of Deposits in the Global Financial Crisis*, Policy Research Working Paper, No. 6577, The World Bank, <DOI: http://dx.doi.org/10.21511/imc.7(1).2016.01>.

Johnson, S., and M. Niño-Zarazúa (2011), "Financial Access and Exclusion in Kenya and Uganda," *Journal of Development Studies*, Vol. 47, No. 3, pp. 475-496.

Karlan, D., A. L. Ratan, and J. Zinman (2014), "Savings by and for the Poor: A Research Review and Agenda," *Review of Income and Wealth*, Vol. 60, No. 1, pp. 36-78.

King, R., and R. Levine (1993), "Finance and Growth: Schumpeter Might Be Right", *The Quarterly Journal of Economics*, Vol. 108, No. 3, pp. 717-737, <http://www.isid.ac.in/~tridip/Teaching/DevEco/Readings/07Finance/05King&Levine-QJE1993.pdf>.

Levine, R. (2005), *Finance and Growth: Theory and Evidence*, NBER Working Paper, No.10766, The National Bureau of Economic Research.

Levine, R., and S. Zervos (1998), "Stock Markets, Banks, and Economic Growth," *The American Economic Review*, Vol. 88, No. 3, pp. 537-558.

Martin, M. (2007), *A Literature Review on the Effectiveness of Financial Education*, Working Paper Series, No. 07-03, Federal Reserve Bank of Richmond, <https://www.richmondfed.org/~/media/richmondfedorg/publications/research/working_papers/2007/pdf/wp07-3.pdf>.

Mehrotra, A., and J. Yetman (2015), "Financial Inclusion–Issues for Central Banks", *BIS Quarterly Review,* March, <http://www.bis.org/publ/qtrpdf/r_qt1503h.pdf>.

Meza, D. de la, B. Irlenbusch, and D. Reyniers (2008), *Financial Capability: A Behavioural Economics Perspective*, Consumer Research, No. 69, London School of Economics.

Murcia, A. (2007), *Determinantes del acceso al crédito de los hogares colombianos*, Borradores de Economía, No. 449, Banco de la República, Colombia.

Roa, M. J. (2013a), "Financial Education and Behavioral Finance: New Insights into the Role of Information in Financial Decisions," *Journal of Economic Surveys*, Vol. 27, No. 2, pp. 297-315.

Roa, M. J. (2015*), Financial Inclusion in Latin America and the Caribbean: Access, Usage and Quality*, Research Papers, No.19, Centro de Estudios Monetarios Latinoamericanos.

Rodríguez-Raga, S., and F. Riaño-Rodríguez (2016), "Determinantes del acceso a los productos financieros en los hogares colombianos," *Estudios Gerenciales*, Vol. 32, pp. 14-24, <http://biblioteca2.icesi.edu.co/cgi-olib/?infile=details.glu&loid=280787&rs=131325&hitno=-1>.

Sahay, R., M. Čihák, P. N'Diaye, A. Barajas, R. Bin, D. Ayala, Y. Gao, A. Kyobe, L. Nguyen, C. Saborowski, K. Svirydzenka, and S. Yousefi (2015), *Rethinking Financial Deepening: Stability and Growth in Emerging Markets, International Monetary Fund*, May, 41 p., <https://www.imf.org/external/pubs/ft/sdn/2015/sdn1508.pdf>.

Salamanca, D. (2014), "Estrategia de inclusión financiera," speech presented at V Congreso Nacional de Asomicrofinanzas, Santiago de Cali, Colombia, May 16.

Simpson, Wayne, and J. Buckland (2009), "Examining Evidence of Financial and Credit Exclusion in Canada from 1999 to 2005," *The Journal of Socio-Economics*, Vol. 38, issue 6, pp. 966–976, <DOI: 10.1016/j.socec.2009.06.004>.

Songul, H., and M. Thesi (2011), "The Relationship between the Financial Development and the Economy Growth in Turkey", *Applied Economics Letters,* Vol. 18, No. 6, University of Tilburg, <http://arno.uvt.nl/show.cgi?fid=120555>.

The Economist Intelligence Unit (2015), *Global Microscope 2015. The Enabling Environment for Financial Inclusion*, Nueva York, <https://centerforfinancialinclusionblog.files.wordpress.com/2015/12/eiu_microscope_2015_web.pdf>.

Tuesta, D., G. Sorensen, A. Haring, and N. Cámara (2015), *Inclusión financiera y sus determinantes: el caso argentino*, Documento de Trabajo, No.15/04, BBVA Research, Madrid.

World Bank (2013), *Capacidades financieras en Colombia: resultados de la encuesta nacional sobre comportamientos, actitudes y conocimientos financieros.*

World Bank (2014), *Global Financial Development Report: Financial Inclusion*, <http://documents.worldbank.org/curated/en/225251468330270218/Global-financial-development-report-2014-financial-inclusion>.