Determinants of Formal and Informal Saving in Colombia

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Abstract

In this paper we perform an empirical study of the determinants of saving among middle- and low-income individuals living in urban and rural areas of Colombia. The results show that the likelihood of saving increases with education, income, labor market participation, and home ownership. The results also demonstrate that education and income increase the probability of saving in banks and decrease the likelihood of informal saving in both urban and rural areas.

Keywords: formal saving, informal saving, urban area, rural area, Colombia.

JEL classification: C25, D14, G21, R20.

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1. INTRODUCTION

Household saving is important because it guarantees financial security during retirement, finances expenditure on housing, education, and health, helps cushion unexpected events (such as sickness, bad harvests, job losses, etc.), provides resources for setting up a business, and smooths consumption throughout life (Callen and Thimann, 1997; Banerjee and Duflo, 2011). These reasons, which vary according to the socioeconomic characteristics of the population, have been widely documented in the literature (Horioka and Watanabe, 1997; Browning and Lusardi, 1996).

Household level studies generally analyze the determinants of aggregate saving and do not take into account possible differences existing between areas of the same country. In Colombia, in particular, there is significant rural-urban diversity. For instance, according to data from the 2013 *Encuesta Longitudinal Colombiana de la Universidad de los Andes* (ELCA), 77% of people in rural areas have five years or less of education, while in urban areas the percentage is 35%. The available income of people in the sample also varies considerably: average income in urban areas is around 750 USD, and in rural areas it is approximately 50% of that figure. Moreover, 20% of household heads in rural areas are women, while in urban areas the figure is 37%. This paper aims to contribute to the literature by separately analyzing the determinants of the probability of saving in rural and urban areas, an aspect that has not been studied in depth for Colombia.

Another important aspect in the analysis of household saving is related to the development of the financial system and financial inclusion, given the constraints these might imply for saving in the formal sector (Bayoumi, 1993). In Colombia, a large percentage of the population in urban and rural areas use informal saving methods. To be specific, according to the ELCA, 50% of middle- and low-income individuals in urban areas save in cash. This figure increases to 82% in rural areas. Furthermore, 27% of people in urban areas and 16% in rural ones save at a bank or financial institution. This paper also contributes to the literature by separately studying formal and informal saving.

The aim of this research is to provide empirical evidence of the determinants of formal and informal saving among middle- and low-income individuals in urban and rural areas of Colombia using

data from the 2013 ELCA. The estimates suggest that the probability of saving increases with education, income, labor market participation, and home ownership. Education and income also increase the likelihood of saving at financial institutions and reduce that of doing so through informal means.

The paper is divided into four sections including this introduction. Section 2 presents a review of national and international literature. Section 3 describes the data and analyzes the factors that affect the likelihood of a person saving, as well as the possible determinants of the probability of saving in the formal or informal sector. Section 4 outlines the main conclusions.

2. LITERATURE REVIEW

Literature on saving in Latin America has focused on analyzing its macroeconomic determinants. These studies find that gross domestic product (GDP) growth, income per capita, and macroeconomic uncertainty have a positive impact on private saving rates because they encourage precautionary saving among individuals. In contrast, interest rate increases and easier ways to access credit have a significant negative impact on private saving rates (Loayza et al., 2000).

In Colombia, Easterly (1991), Cárdenas and Escobar (1998), and Ocampo and Tovar (1998) analyze the factors that determine private saving, taking into account the aggregate variables that influence its behavior. However, macroeconomic variables do not fully explain the reasons why people save; therefore, a new line of research has focused on microeconomic analysis aimed at explaining the factors that determine household saving. For instance, Castañeda (2001) finds that the decline in saving rates during the nineties was mainly due to the behavior of household saving. This result is explained by the demographic structure of the economically dependent population, high-income concentration, low levels of education among households, and lack of interest rate sensitivity of savings. More recently, Cadena and Quintero (2015), present descriptive statistics obtained from the results of the ELCA with respect to saving in rural and urban areas among household heads and their partners for 2010 and 2013. In particular, the authors characterize savers and study the main objectives of saving. Finally, Rodríguez-Raga and Riaño-Rodríguez (2016), use the first round (2010) of the ELCA to examine

the determinants of household access to formal saving products. The authors point out that higher household income, home ownership, education, and labor market participation foster private saving.

International literature has identified some household characteristics associated with the habit of saving. For instance, it has been shown that there is a positive relation between saving rates and income in both developed and developing countries[1]. On the other hand, the literature on the relation between saving and the level of education of the household head are ambiguous. Although some studies find a positive association between these two variables (Avery and Kennickell, 1991; Bernheim and Scholz, 1993; Attanasio, 1993; Browning and Lusardi, 1996; Attanasio and Székely, 1998; and Butelman and Gallego, 2000), others do not identify a significant relation, while some even find a negative one (Coronado, 1998; Denizer and Wolf, 1998; Bebczuk et al., 2015).

The influence of household composition on saving decisions has also been highlighted. For instance, people who are married behave differently than those who are single, since an additional source of income allows for having more savings. Single-head households with children tend to save less. Moreover, the household saving rate shrinks as the number of household members rise, but increases with the number of earners (Bosworth et al., 1991; Browning and Lusardi, 1996; Coronado, 1998; Butelman and Gallego, 2000). The role of women can be ambiguous with regards to saving. Studies such as those of Levenson and Besley (1996), Carpenter and Jensen (2002), Kedir and Ibrahim (2011), and Bebczuk et al. (2015) find that women participate more in informal saving schemes than formal ones.

Asset ownership can also play an important role in this topic. On the one hand, households that own financial assets tend to have higher rates of saving than those that do not (Castañeda, 2001; Bosworth et al., 1991). On the other hand, home ownership appears to have a more ambiguous effect. For instance, while Bebczuk et al. (2015) find that the saving rate in Latin America increases if households own

[1] For developed countries see, for instance, Bosworth et al. (1991), Poterba (1994), Browning and Lusardi (1996); for developing countries, see Coronado (1998), Székely (1998), Attanasio and Székely (1998), Denizer and Wolf (1998), Butelman and Gallego (2000), Castañeda (2001), Newman, et al. (2008), Bebczuk et al. (2015), and Schclarek and Caggia (2015).

their own home, Castañeda (2001) shows that in Colombia, households who own their home reduced their saving rate. Other factors that can positively influence saving are the household head being in formal employment (Bebzcuk et al., 2015), and belonging to religious or political groups (Newman et al., 2008).

It is necessary to take into account that capital market imperfections, or lack of access to credit and saving opportunities in formal financial systems, can lead to decisions to save through informal means. Studies such as those of Levenson and Besley (1996) for Taiwan, Kedir and Ibrahim (2011) for Ethiopia, and Carpenter and Jensen (2002) for Pakistan, explore the importance of informal financial systems as a significant source for accessing saving and credit opportunities in low-income countries.

Various studies evaluating the macroeconomic determinants of saving have revealed mixed results when assessing the life-cycle hypothesis of Modigliani. The study of Bebczuk et al. (2015) on saving in Latin America contends that the age of household heads has a positive, but decreasing, impact on saving. Levenson and Besley (1996) in their analysis of the rotating savings and credit associations (Roscas) in Taiwan show that participation in this informal system is higher among young people. Schclarek and Caggia (2015) show that, contrary to expectations, the relation between age and the saving rate in Chile is *U* shaped. Meanwhile, Castañeda (2001) explains that Colombian households respond more to current than future income. All these results demonstrate that macroeconomic theories on saving are inaccurate when data is analyzed at a microeconomic level.

Besides the literature studying the determinants of saving, there is another line of research that seeks to solve problems related to reduced saving levels, especially among low-income groups. A recent book edited by Cavallo and Serebrisky (2016) studies in detail the status of saving in Latin America and the Caribbean, suggesting that savings are low in the region and should be used more efficiently to achieve higher economic growth rates. The book examines the role played by the financial system in generating saving: how households, businesses, and governments can address problems and challenges by leveraging opportunities to achieve higher saving rates, and thereby promote development and well-being. Karlan et al. (2014) mention that low levels of saving could have significant implications for people's well-being, particularly regarding their consumption,

capacity to respond to shocks, and inability to make possibly profitable investments. They also identify five types of constraints that might be impeding the effective use of saving products and services by the poor, such as transaction costs, lack of trust and regulatory barriers, asymmetric information, social restrictions, and behavioral issues.

Likewise, Di Giannatale and Roa (2016) present an in-depth review of the literature on the obstacles to formal saving, from both the supply side (access to financial products) and the demand side (use and frequency of use of those products). The authors also discuss the determinants of formal saving from a theoretical and empirical point of view. To overcome all these obstacles, the literature proposes making rapid-impact interventions, such as encouraging *mental accounting*, which consists of defining a monthly expenditure plan where people commit to certain specific amounts per expenditure category. This creates a psychological cost for individuals to transfer money from one account, such as utilities expenses, to another, such as entertainment (see Shefrin and Thaler, 1992; Thaler, 1999; Salas, 2015). Mental accounting can be enhanced by peer pressure, which consists of informing a friend or family member of a spending plan so that person can both help to follow it and reduce the temptation (and increase the cost) of transferring money from one spending category to another (Kast et al., 2012). Furthermore, to encourage saving in the financial system, the literature suggests using word of mouth (social networks) to disseminate information about the advantages of saving in formal institutions, generating confidence in the system and contributing to its promotion (Newman et al., 2008).

3. DATA AND RESULTS

We analyze saving among households in urban and rural areas using the second round of the ELCA conducted in 2013, which includes data on income and expenditures, education, social capital, and composition of urban and rural households in Colombia. The urban sample contains information on 4,911 households, representing socioeconomic strata one to four (low and middle income) from five regions of the country (Bogotá, Central, Oriental, Atlántica, and Pacífica). The rural sample includes data on 4,351 households, representing

households from strata one and two in the Atlántica, Altiplano Cundi-Boyacense, Eje Cafetero, and Centro-Oriente regions.

Detailed data on household income and expenditures from the ELCA was employed to calculate saving rates, considering socioeconomic characteristics in order to identify variations in the saving habits of different urban and rural population groups. Saving rate calculations show that in 2013 the average saving rate of middle- and low-income households in urban areas was -1.6% and 3.2% in rural areas. These saving rates increase to 19.2% and 16.2%, respectively, when spending on durable goods, education, and health are excluded, suggesting households carry out some of their saving by purchasing such goods, which could be considered as investment[2]. Evaluating saving rates by income quintile, we observe that in both urban and rural areas they increase considerably with each quintile, implying a positive relation between household income and saving as suggested by the literature (see, for instance, Bosworth, et al., 1991; Butelmann and Gallego, 2000; Huggett and Ventura, 2000; Dynan et al., 2004).

In addition, by gender of the household head, we find that male-headed households have higher saving rates than those whose head is female. This difference is greater in rural areas, which would suggest less empowerment for women. These results are consistent with Bosworth et al. (1991), who find that households headed by single mothers have low saving rates. Bernasek and Shwiff (2001) also find significant differences between men and women's investment and saving decisions, and Ahmad and Asghar (2004) show that the gender employment gap between men and women influences the fact that saving rates vary by gender. Moreover, the results show that saving rates increase with the level of education of the household head in both urban and rural areas. It stands out that gains in savings as the level of education increases, are higher in rural areas, meaning it is recommendable to foster improvements in the education of the population located in those areas of the country. As set out in Lusardi

[2] Household saving is defined as available income minus expenditure items, and the saving rate as household saving divided by available income. For a more detailed study of saving rates where different definitions of expenditure are considered, see Iregui et al. (2016). See also Melo et al. (2006).

(2008), a lack of saving skills can be associated with low levels of education and consequently to limited financial literacy.

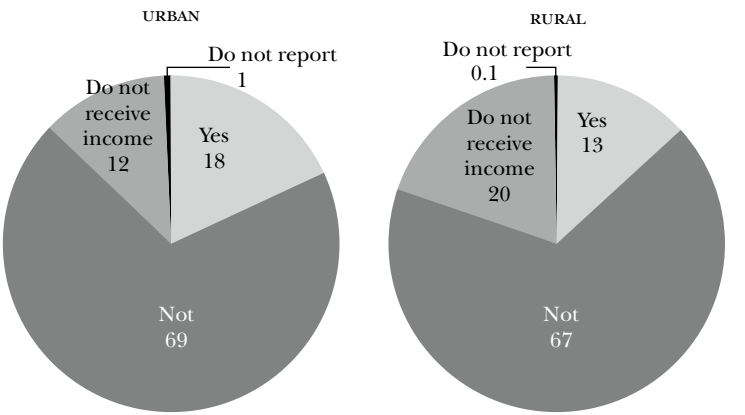
Given the differences found in saving rates by area and socioeconomic characteristics, the factors affecting the likelihood of a person saving are explored below. We also examine the determinants of whether this saving is made formally or informally. To do this we employ logit models, using data for individuals, household heads and their partners: 7,738 for urban areas and 7,533 for rural ones.

3.1 Determinants of the Likelihood of Saving

This section analyzes the determinants of saving among low- and middle-income individuals using a sample of household heads and their partners for urban and rural areas. In general, the data indicates that a small percentage of people in the sample save: 18% in urban areas and 13% in rural ones (Figure 1).

Figure 1

DO YOU SAVE A PART OF YOUR INCOME REGULARLY?
Percentage of responses, second round year 2013



Source: ELCA.

To understand the determinants of people's saving behavior we estimate the following equation using logit models:[3]

$$Savings_i = \beta_0 + \beta_1 X_{1,i} + \beta_2 X_{2,i} + \upsilon_i, \quad (1)$$

where *Savings* is a binary variable that indicates whether individual i saves (1) or not (0). $X_{1,i}$ includes the characteristics of household i (e.g. income, size, region where it is located, and home ownership) and $X_{2,i}$ contains the characteristics of individual i (e.g. age, age squared, sex, education, marital status, and employment). Annex lists the definitions of those variables, as well as the descriptive statistics.

Table 1 shows the results of the estimations.[4] As can be seen, when individuals are classified by age group in the urban and rural samples, people between 15 and 47 years of age have a higher probability of saving than those who are over 58, the reference group. This result is consistent with the life-cycle theory (Modigliani, 1966) according to which a person saves during their most productive years and dissaves towards the end of their life.

Higher levels of education increase the likelihood of people saving in both areas. This could be because highly educated people tend to be more patient and consider the future (Bebczuk et al., 2015). The education results are consistent with Morisset and Revoredo (1995), who analyze a panel of 74 countries between 1960 and 1990, finding that education has a positive influence on saving.

As for income, in urban areas it can be seen that an increase in the income quintile raises the likelihood of saving, as compared to the lowest-income quintile. In rural areas, only individuals in the highest quintile have a greater probability of saving (6%) than those in quintile 1. In urban areas, the larger the household size the lower the probability of saving. To understand the effects of wealth on saving, a dichotomous variable was included in the analysis that indicates whether a household is a homeowner or not. We find that home ownership increases the likelihood of saving in urban and rural areas.

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[3] The estimations were performed using clustered errors at household level and included the corresponding expansion factors.

[4] The estimations were also carried out for the sample of employed individuals to establish whether saving depends on the type of employment a person has. These results are not presented here to save space, but are available upon request.

TABLE 1

DETERMINANTS OF THE LIKELIHOOD OF SAVING (LOGIT ESTIMATION)
Marginal effects[1]

Dependent Variable:One if the person saves and zero if not

Explanatory Variables	*Urban*		*Rural*	
	dy/dx	*Standard Error*	*dy/dx*	*Standard Error*
Age 15 to 25	0.1131	(0.0664)[c]	0.1136	(0.0393)[a]
Age 26 to 37	0.1354	(0.0367)[a]	0.0616	(0.0176)[a]
Age 38 to 47	0.0680	(0.0311)[b]	0.0522	(0.0152)[a]
Age 48 to 57	0.0317	(0.0286)	0.0138	(0.0143)
Sex (male = 1)	−0.0091	(0.0145)	0.0104	(0.0097)
Married (yes = 1)	−0.0216	(0.0292)	−0.0017	(0.0164)
Separated (yes = 1)	−0.0128	(0.0317)	0.0321	(0.0265)
Middle school/ high school (yes = 1)	0.0186	(0.0225)	0.0319	(0.0115)[a]
Technical/technological education (yes = 1)	0.0069	(0.0309)	0.0797	(0.0420)[c]
Tertiary education (yes = 1)	0.0744	(0.0366)[b]	0.1050	(0.0509)[b]

Labor market participation (yes = 1)	0.1376	(0.0154)[a]	0.0911	(0.0096)[a]
Income quintile 2	0.0643	(0.0375)[c]	0.0215	(0.0158)
Income quintile 3	0.1090	(0.0365)[a]	0.0080	(0.0157)
Income quintile 4	0.1121	(0.0367)[a]	0.0089	(0.0161)
Income quintile 5	0.1705	(0.0468)[a]	0.0580	(0.0179)[a]
Household size	−0.0239	(0.0061)[a]	−0.0028	(0.0028)
Homeowner (yes = 1)	0.0534	(0.0194)[a]	0.0207	(0.0092)[b]
Remittances from Colombia (yes = 1)	−0.0068	(0.0256)	0.0212	(0.0107)[b]
Remittances from abroad (yes = 1)	0.0033	(0.0331)	0.0230	(0.0314)
Government programs (yes = 1)	0.0067	(0.0253)	−0.0171	(0.0110)
Insurance (yes = 1)	0.0533	(0.0171)[a]	0.0298	(0.0102)[a]
Fixed regional effects	Yes	Yes	Yes	Yes
Number of observations	7,738		7,533	

Note [1] Marginal effects were calculated at the mean for the continuous variable and at 1 for the dichotomous variables. [a] $p<0.01$, [b] $p<0.05$, [c] $p<0.1$
Source: Authors' calculations.

This result is similar to that reported by Peltonen et al. (2009), and Butelmann and Gallego (2000), who find a positive relation between wealth and saving, specifically finding that home ownership encourages saving. According to Bebczuk et al. (2015), this result could be because a person who owns their home does not have to pay monthly rent, and therefore has a higher margin of income for saving.

Participation in the job market increases the likelihood of saving (14% in urban areas and 9% in rural ones). Meanwhile, receiving domestic remittances only raises the probability of saving in rural areas (2%). This responds to the fact that remittances are generally transferred from urban to rural areas. Such results are in line with Rodríguez-Raga and Riaño-Rodríguez (2016), who find that greater access to resources increases the probability of saving in Colombia. On the other hand, being a beneficiary of government programs is not important in saving decisions.[5] The latter suggests that such programs should focus more on promoting saving. Finally, having insurance or not was included as a proxy variable for risk aversion, which was positive and significant in the estimations.[6] This result suggests that people who are risk averse are more likely to save (5% in urban areas and 3% in rural ones).

3.2 Differences in the Likelihood of Formal and Informal Saving

This section presents the descriptive statistics and reports the results of the estimations for the determinants of formal and informal saving. Figure 2 illustrates how the majority of household heads and their partners save in cash (50% in urban areas and 82% in rural ones). Financial institutions do not appear to be very attractive for

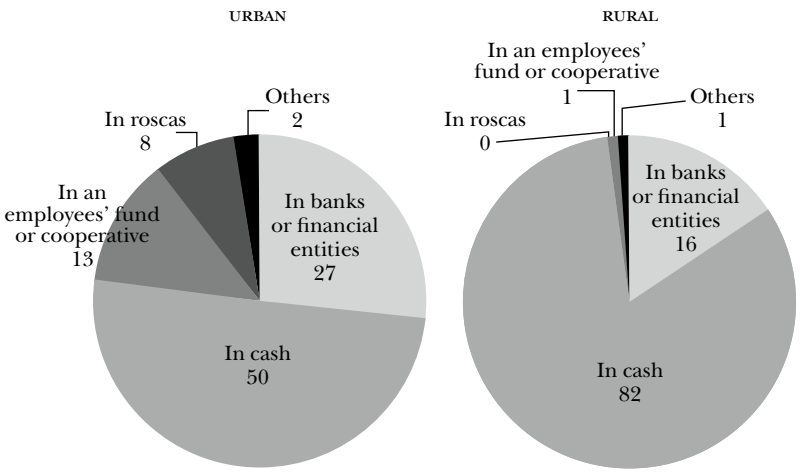
[5] The survey asks whether households have benefited from the following programs or aid in the prior 12 months: Families in action, programs for senior citizens, education programs offered by the *Servicio Nacional de Aprendizaje* (SENA), *Red Juntos-Unidos*, programs of the *Instituto Colombiano de Bienestar Familiar* (ICBF), natural disaster relief, and assistance for displaced persons.

[6] It would be interesting to include variables such as financial education, and risk and time preferences in this analysis, as done by Di Giannatale et al. (2015). Unfortunately, the ELCA does not contain these types of variables. It doescontain however, data on ownership of insurance policies. We therefore decided to add this variable to the estimation as a proxy variable for people's risk aversion.

Figure 2

WHERE DO YOU MAINLY SAVE ?

Percentage of responses, second round year 2013



Source: ELCA.

savers, given that only 27% of urban individuals and 16% of rural ones report saving in such establishments.

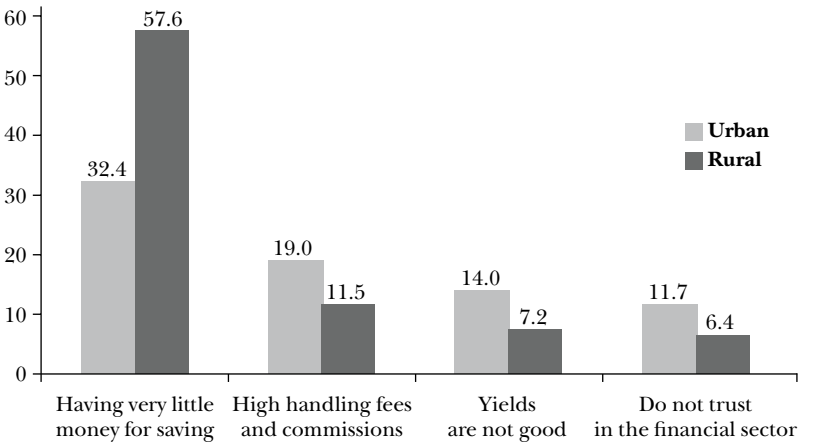
In light of the small percentage of savers in banks or financial institutions, we investigate the reasons why people do not use those financial intermediaries. Their motives include supply and demand side aspects. Among the supply factors, which are related to access to financial products, the ELCA delves into aspects related to the costs and yields of products, as well as the paperwork required. On the demand side, the survey asks about barriers associated to a lack of trust in institutions, lack of knowledge regarding the procedures to access products, and lack of resources for saving.[7] Figure 3 presents the main reasons why individuals do not save in financial institutions. In urban areas, 32% of people argue they have very little money for saving, 19% report not saving because of high handling fees and commissions, 14% state that the yields are not good, and

[7] For further details on the barriers to saving, see Di Giannatale and Roa (2016).

Figure 3

REASONS FOR NOT SAVE IN THE FINANCIAL SYSTEM

Percentage of responses, second round year 2013



Source: ELCA.

12% say they do not trust the financial sector. In rural areas, 57% of people argue they do not have money to save, followed by 12% who say they do not save because handling fees are too high.

Finally, figure 4 shows that people from both areas mainly save for old age, education, and emergencies. Besides those categories, in urban areas, purchasing a home is one of the most important reasons, while in rural areas, health and paying debts are included among the most important reasons for saving.[8]

We now study the possible determinants of the likelihood that people save in a bank or employee fund (formal), or in cash or roscas (informal). We estimate the following equation for each type of saving:

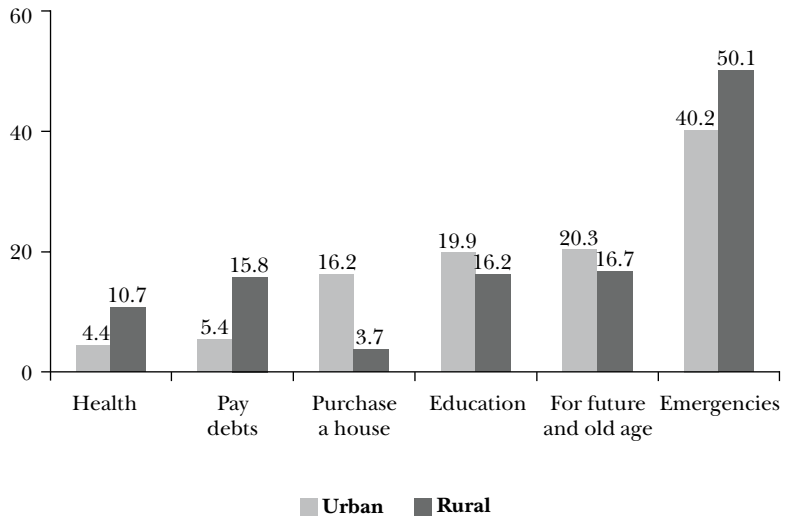
$$Saves\_in_i = \alpha_0 + \alpha_1 X_{1,i} + \alpha_2 X_{2,i} + \alpha_3 X_{3,i} + \varepsilon_i, \quad (2)$$

[8] It should be pointed out that people can report several reasons for saving in the survey.

Figure 4

PRINCIPAL REASON FOR SAVING

Percentage of responses, second round year 2013



Source: ELCA.

where *Saves_in* is a binary variable that takes the value one if person *i* saves in a bank, an employee fund, cash, or roscas, and zero if not. $X_{1,i}$ y $X_{2,i}$ are defined as in equation 1 and $X_{3,i}$ includes the reasons given for saving by person *i* (e.g. purchasing a home, purchasing other assets, emergencies, or paying debts).

Table 2 shows the marginal effects of the estimations.[9] As can be seen, in urban areas, people under 37 years of age are less likely to save in banks than the reference group, while the 38 to 47 age group are more likely to save in roscas. In rural areas, people over the age of 58 are more likely to save in banks than other age groups, while they are less likely to save in cash.

In urban areas, being male increases the probability of saving in banks (6%) and decreases that of saving in roscas (5%), while in

[9] The estimations were also performed for the sample of people in employment. For matters of space, these results are not presented here, but are available upon request.

rural areas it increases the probability of saving in banks (5%) and decreases that of doing so in cash (6%). As for marital status, in urban areas being married or separated increases the probability of saving in employee funds, as compared to people who are single or widowed, and decreases the likelihood of saving in banks. Education is a variable highly correlated to saving, as analyzed in the previous section. In particular, education increases the probability of saving in financial institutions in both areas, but decreases the probability of saving in cash and in roscas. That is, education fosters formal saving and discourages informal saving.

In urban and rural areas, the highest income quintiles are more likely to save in a bank and less likely to do so in cash than quintile 1. Hence, higher income households are more likely to save in the formal sector than in the informal sector. As the size of household increases, the probability of saving in a bank declines. Meanwhile, homeowners have a higher probability of saving in banks in rural areas.

Household heads or partners in urban areas that report saving for old age do so mainly in employee funds. Moreover, those who save to purchase a home are more likely to do so in the formal sector and less likely to do so in cash. This might be because it represents a major investment for people and financial institutions can be safer. Meanwhile, those who save for emergencies prefer to do so in cash (this increases the probability by 11%), and to a lesser extend in roscas (this decreases the probability by 8%). This might be a result of the fact that roscas generally have specific aims and restrictions for using or withdrawing money. In rural areas, those who save to purchase a home are the most likely to do so in banks (37%), and the least likely to do so in cash (30%). On the other hand, saving for emergencies is done in cash (this increases the probability by 6%).

Remittances from abroad increase the likelihood of saving in banks by 13% in rural areas. The latter is an expected result given that international transfers are generally made through financial institutions. Finally, risk aversion increases the probability of saving in the formal sector, and decreases that of saving in cash in both urban and rural areas.

Table 2

DETERMINANTS OF THE LIKELIHOOD OF SAVING: WHERE DO YOU SAVE? (LOGIT ESTIMATION)
Marginal effects[1]

Dependent variable: one if a person saves in that way and zero if not

	Urban				*Rural*	
	Bank	*Fund*	*Cash*	*Roscas*	*Bank*	*Cash*
Age 15 to 25	−0.1560	0.0335	0.1492	0.0738	−0.1156	0.1102
	(0.0772)[b]	(0.1360)	(0.0956)	(0.0985)	(0.0165)[a]	(0.0409)[a]
Age 26 to 37	−0.1267	0.1033	0.0756	0.0671	−0.0747	0.0922
	(0.0724)[c]	(0.0928)	(0.0596)	(0.0524)	(0.0268)[a]	(0.0295)[a]
Age 38 to 47	0.0158	−0.0083	−0.0065	0.1072	−0.0315	0.0585
	(0.0748)	(0.0830)	(0.0552)	(0.0649)[c]	(0.0282)	(0.0321)[c]
Age 48 to 57	0.0439	0.0442	−0.0356	0.0326	−0.0502	0.0537
	(0.0689)	(0.0829)	(0.0537)	(0.0544)	(0.0263)[c]	(0.0296)[c]
Sex (male = 1)	0.0635	0.0486	−0.0386	−0.0450	0.0449	−0.0629
	(0.0326)[c]	(0.0340)	(0.0354)	(0.0202)[b]	(0.0197)[b]	(0.0216)[a]
Married (yes = 1)	−0.1176	0.0961	0.0226	0.0299	−0.0353	0.0253
	(0.0604)[c]	(0.0505)[c]	(0.0495)	(0.0344)	(0.0356)	(0.0362)
Separated (yes = 1)	−0.2312	0.2645	0.0409	0.0435	−0.0046	0.0015
	(0.0457)[a]	(0.1199)[b]	(0.0670)	(0.0684)	(0.0504)	(0.0554)
Middle school/high school (yes = 1)	0.0103	0.0398	−0.0250	−0.0303	−0.0007	−0.0263
	(0.0479)	(0.0586)	(0.0488)	(0.0309)	(0.0239)	(0.0284)

Table 2 (cont.)

	Urban				*Rural*	
	Bank	*Fund*	*Cash*	*Roscas*	*Bank*	*Cash*
Technical/technological education (yes = 1)	−0.0232	0.1056	−0.0589	−0.0113	−0.0622	0.0499
	(0.0573)	(0.0789)	(0.0549)	(0.0320)	(0.0441)	(0.0485)
Tertiary education (yes = 1)	0.1561	0.1181	−0.2126	−0.1181	0.1447	−0.1784
	(0.0712)[b]	(0.0766)	(0.0628)[a]	(0.0405)[a]	(0.0815)[c]	(0.0888)[b]
Labor market participation (yes = 1)	−0.0257	0.0683	−0.0716	−0.0238	−0.0075	0.0003
	(0.0525)	(0.0497)	(0.0563)	(0.0444)	(0.0334)	(0.0352)
Income quintile 2	−0.0064	0.0758	0.0107	−0.0270	0.0067	−0.0265
	(0.0706)	(0.1000)	(0.0740)	(0.0427)	(0.0382)	(0.0443)
Income quintile 3	0.0898	0.0385	−0.0517	−0.0138	0.0140	−0.0380
	(0.0635)	(0.0908)	(0.0652)	(0.0364)	(0.0401)	(0.0476)
Income quintile 4	0.0779	−0.0222	0.0335	−0.0285	0.0603	−0.0916
	(0.0681)	(0.0817)	(0.0636)	(0.0365)	(0.0442)	(0.0504)[c]
Income quintile 5	0.2065	0.0448	−0.1480	−0.0053	0.0750	−0.1028
	(0.0834)[b]	(0.0931)	(0.0741)[b]	(0.0447)	(0.0381)[b]	(0.0432)[b]
Household size	−0.0381	0.0156	0.0144	−0.0032	0.0063	−0.0025
	(0.0136)[a]	(0.0100)	(0.0110)	(0.0069)	(0.0053)	(0.0055)
Homeowner (yes = 1)	0.0150	0.0316	−0.0323	−0.0137	0.0541	−0.0366
	(0.0407)	(0.0366)	(0.0389)	(0.0269)	(0.0221)[b]	(0.0250)
Saves for the future and old age (yes = 1)	0.0057	0.0744	−0.0529	−0.0069	0.0282	−0.0157
	(0.0413)	(0.0444)[c]	(0.0435)	(0.0306)	(0.0350)	(0.0352)

Saves to pay children's or own education (yes = 1)	0.0242	0.0522	−0.0157	−0.0600	0.0448	−0.0437
	(0.0552)	(0.0539)	(0.0429)	(0.0249)[b]	(0.0314)	(0.0338)
Saves to purchase a home (yes = 1)	0.1322	0.0766	−0.1465	−0.0387	0.3672	−0.3032
	(0.0622)[b]	(0.0626)	(0.0489)[a]	(0.0266)	(0.1031)[a]	(0.0996)[a]
Saves to purchase other assets (yes = 1)	−0.0783	−0.1524	0.0521	0.1187	0.0073	0.0026
	(0.0817)	(0.0278)[a]	(0.0676)	(0.0596)[b]	(0.0577)	(0.0568)
Saves for emergencies (yes = 1)	0.0086	−0.0266	0.1122	−0.0808	−0.0288	0.0571
	(0.0387)	(0.0435)	(0.0452)[b]	(0.0218)[a]	(0.0296)	(0.0317)[c]
Saves to pay debts (yes = 1)	−0.2559	−0.0802	0.0008	0.2130	−0.0298	0.0570
	(0.0584)[a]	(0.0702)	(0.0820)	(0.0909)[b]	(0.0288)	(0.0298)[c]
Remittances from Colombia (yes = 1)	−0.0701	−0.0162	0.0086	0.0690	−0.0131	0.0058
	(0.0536)	(0.0590)	(0.0422)	(0.0524)	(0.0271)	(0.0292)
Remittances from abroad (yes = 1)	0.0938	−0.0723	−0.0798	0.0558	0.1260	−0.1114
	(0.0694)	(0.0642)	(0.0657)	(0.0833)	(0.0727)[c]	(0.0732)
Government programs (yes = 1)	0.0160	−0.0032	0.0402	−0.0499	−0.0062	−0.0057
	(0.0547)	(0.0456)	(0.0400)	(0.0235)[b]	(0.0214)	(0.0233)
Insurance (yes = 1)	0.0844	0.0825	−0.2053	0.0457	0.0470	−0.0533
	(0.0393)[b]	(0.0361)[b]	(0.0424)[a]	(0.0204)[b]	(0.0233)[b]	(0.0254)[b]
Fixed regional effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	1,373	1,373	1,373	1,373	983	983

Marginal effects were calculated at the mean for the continuous variable and at 1 for dichotomous variables.
Robust standard errors in parenthesis. [a] $p<0.01$, [b] $p<0.05$, [c] $p<0.1$
Source: authors' calculations.

6. CONCLUSIONS

This paper performs an empirical analysis of the saving behavior of middle and low-income individuals in urban and rural areas of Colombia using the second round of the ELCA conducted in 2013. To this end, we analyzed factors that affect the probability of saving of household heads or their partners, and assessed the possible determinants of the likelihood of a person saving in the formal or informal sector.

The results show that the likelihood of saving increases with the level of education, income, and home ownership. It is worth mentioning that education is of major importance, especially in rural areas where around 80% of individuals in the sample have five or less years of education. The results therefore show that people of all education levels in rural areas are more likely to save than those with primary education or less. Saving can be encouraged by running financial education campaigns with simple fast-impact behavioral interventions that encourage changes in the attitudes of low- and middle-income individuals towards spending their available income in a controlled and responsible manner. For instance, as mentioned, mental accounting could be complemented by the peer-pressure effect to help mitigate common behavioral biases among individuals when making financial decisions. We also observe how labor market participation increases the probability of saving in both areas. Thus, policies targeted at fostering formal employment and social security inclusion could enable households to increase their savings (Bebczuk et al., 2015).

An examination of the differences between formal and informal saving highlights that 50% of people in urban areas and 82% in rural ones save in cash. The estimations also show that education and income increase the likelihood of saving in banks and decreases that of saving in cash. One type of policy aimed at including families in the middle and low socioeconomic strata into the financial system could involve word of mouth to disseminate information within such communities and help to encourage formal saving (Newman et al., 2008). Another policy for promoting financial inclusion would be to reduce the financial costs families incur when saving.

Finally, targeted policies could be considered. For instance, given how the study reveals that being male increases the probability of saving in financial institutions, a policy designed to promote saving in

the banking system among women could lead to an overall increase in saving. Furthermore, the study demonstrates that the highest income quintiles save more in banks and that a better education also raises the likelihood of saving in such institutions. Hence, a policy to encourage saving that focuses on the poorest and least educated households could contribute to improving the living standard of such households.

ANNEX

Variables Used in the Estimations and Descriptive Statistics

Table A.1

DESCRIPTION OF VARIABLES

Variables	*Description*
Endogenous Variables	
Saves	One if the person saves some of the income they receive; zero if they do not save.
Saves in the bank	One of the person saves in a bank or financial institution; zero if not.
Saves in a fund	One if the person saves in an employee fund; zero if not.
Saves in cash	One if the person saves in cash; zero if not.
Saves in a rosca	One if the person saves in roscas; zero if not.
Explanatory Variables	
Age 15 to 25	One if the person is aged between 15 and 25; zero if not.
Age 26 to 37	One if the person is aged between 26 and 37; zero if not.
Age 38 to 47	One if the person is aged between 38 and 47; zero if not.

Age 48 to 57	One if the person is aged between 48 and 57; zero if not.
Aged over 58	One if the person is aged over 58; zero if not.
Sex	One if the person is male; zero if not.
Married	One if the person is married or cohabiting; zero if not.
Separated	One if the person is separated; zero if not.
Widowed	One if the person is widowed; zero if not.
Single	One if the person is single; zero if not.
No education	One if the person has no formal education; zero if they do.
Primary education	One if the highest education attained by the household head is basic/primary level; zero if not.
Middle school/ high school	One if the highest education attained by the household head is middle /high school; zero if not.
Technical/ technological education	One if the highest education attained by the household head is technical with or without a degree, or technological with or without a degree; zero if not.
Higher education	One if the highest education attained by the household head is university with or without graduation, postgraduate degree with or without graduation; zero if not.
Household income	Total household income consisting of labor and non-labor income. An alternative definition was used for rural areas that also included other payments received by the household besides wages (food, housing or education subsidies, or food or transportation benefits, or family allowance) and net profits or fees generated by their activities.

Variables	*Description*
Household size	The number of people in the person's household.
Homeowner	One if the person's household is a homeowner (fully paid for or being paid for); zero if not.
Labor market participation	One if the person participated in the labor market; zero if they do not.
Saves for the future and old age	One if the person saves for the future and old age; zero if not.
Saves for education	One if the person saves to pay for their children's or own education; zero if not.
Saves to purchase a home	One if the person saves to purchase a home; zero if not.
Saves to purchase other assets	One if the person saves to purchase other assets; zero if not.
Saves for emergencies	One if the person saves for emergencies; zero if not.
Saves to pay debts	One if the person saves to pay debts; zero if not.
Remittances from Colombia	One if the person's household received support in money and/or in kind from family members or friends living in Colombia; zero if not.
Remittances from abroad	One if the person's household received support in money and/or in kind from family members or friends living abroad; zero if not.
Government programs	One if the person's household received or benefitted from the following programs or support: Families in action, programs for senior citizens, SENA education programs, *Red Juntos-Unidos,* ICBF programs, natural disaster relief, and assistance for displaced persons; zero if not.
Insurance	One if members of the household have some type of insurance; zero if not.

Table A.2

DESCRIPTIVE STATISTICS

Variables	*Urban*				*Rural*			
	Average	*Standard deviation*	*Minimum*	*Maximum*	*Average*	*Standard deviation*	*Minimum*	*Maximum*
Saves	0.181	0.385	0	1	0.131	0.337	0	1
Saves in the bank	0.267	0.442	0	1	0.158	0.365	0	1
Saves in a fund	0.126	0.332	0	1				
Saves in cash	0.503	0.500	0	1	0.816	0.387	0	1
Saves in a rosca	0.078	0.271	0	1				
Age	45	13	15	88	47	13	15	97
Age 15 to 25	0.050	0.215	0	1	0.036	0.186	0	1
Age 26 to 37	0.250	0.433	0	1	0.209	0.407	0	1
Age 38 to 47	0.266	0.442	0	1	0.270	0.444	0	1
Age 48 to 57	0.252	0.434	0	1	0.246	0.431	0	1
Aged over 58	0.168	0.374	0	0	0.228	0.419	0	1
Sex (male)	0.430	0.495	0	1	0.484	0.500	0	1
Married	0.791	0.406	0	1	0.870	0.336	0	1
Separated	0.117	0.321	0	1	0.052	0.222	0	1
Widowed	0.036	0.187	0	1	0.033	0.179	0	1

Single	0.056	0.230	0	1	0.045	0.206	0	1
No education	0.046	0.210	0	1	0.109	0.312	0	1
Primary education	0.309	0.462	0	1	0.658	0.474	0	1
Middle school/high school	0.433	0.496	0	1	0.207	0.405	0	1
Technical/technological education	0.117	0.321	0	1	0.015	0.122	0	1
Tertiary education	0.095	0.293	0	1	0.010	0.102	0	1
Household size	4	2	1	39	5	2	1	18
Homeowner	0.498	0.500	0	1	0.615	0.487	0	1
Labor market participation	0.712	0.453	0	1	0.660	0.474	0	1
Saves for the future	0.203	0.402	0	1	0.167	0.373	0	1
Saves for education	0.199	0.399	0	1	0.162	0.368	0	1
Saves to purchase a home	0.162	0.368	0	1	0.037	0.189	0	1
Saves to purchase other assets	0.047	0.213	0	1	0.034	0.181	0	1
Saves for emergencies	0.402	0.490	0	1	0.501	0.500	0	1
Saves to pay debts	0.054	0.225	0	1	0.158	0.365	0	1
Remittances from Colombia	0.204	0.403	0	1	0.276	0.447	0	1
Remittances from abroad	0.039	0.195	0	1	0.024	0.153	0	1
Government programs	0.368	0.482	0	1	0.612	0.487	0	1
Insurance	0.565	0.496	0	1	0.377	0.485	0	1

Source: Authors' calculations based on the second round of the 2013 Encuesta Longitudinal Colombiana de la Universidad de los Andes.

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