Demand factors that influence financial inclusion in Mexico: analysis of the barriers based on the ENIF survey

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December 2013

Abstract

In Mexico 62% of adults between the ages of 18 and 70 do not have formal savings or credit products, even though 97% of adults have access to them through different channels. The difference between the supply and the effective use of the financial system means the existence of demand barriers that have not been explored fully so far. Thanks to the interest of the Mexican government in measuring and evaluating financial inclusion from the point of view of supply and demand, the first National Financial Inclusion Survey (Encuesta Nacional de Inclusión Financiera, ENIF) was applied in 2012 in Mexico. It has become a model in Latin America for the study of demand for financial services. Using ENIF data, and a probit model, we have analyzed the socioeconomic factors that from the point of view of individual demand, influence the decision of whether or not to use formal saving or credit financial services in Mexico. According to our analysis, the insufficiency or variability of income and self-exclusion are the most important barriers in the Mexican market. They are influenced by three types of factors: 1) variables that denote individual vulnerability, such as income level, gender, education and occupation; 2) geographical variables with respect to the size of the community in which the individual lives (towns with a population of less than 15,000 or more than 15,000; and 3) variables that appear related to a preference for the informal financial market, such as the capacity to respond to exogenous shocks and belonging to households with a capacity to save.

Keywords: financial inclusion, financial institutions, barriers, personal finance.

JEL: C01, D14, G21.

Summary

Today, more than 2.5 billion adults are excluded from the financial system, according to estimates by the World Bank. This total is focused on the poorest population, which lives in rural areas and developing countries. In recent years, both public policy and private initiative have become increasingly concerned with estimating the number of those excluded, as well as defining and studying financial inclusion. This is reflected both in regulatory changes designed to promote financial inclusion, and in the arrival of new products and players on the market aimed at sectors of the population that previously were out of the reach of traditional banking.

A variety of concepts are used to understand financial inclusion; this study adopts the definition of the Mexican National Banking and Securities Commission (CNBV), according to which financial inclusion "… *includes access and use of financial services under an appropriate regulation that guarantees systems of protection for the consumer and promotes financial literacy in order to improve the financial capacity of all segments of the population.*" According to this concept, financial inclusion has four components: 1) access; 2) use; 3) consumer protection; and 4) financial literacy. Access refers to the level of penetration of the financial system through appropriate infrastructure for each type of population group, determined by the points of contact between people and institutions (channels). Use is defined as purchase of one or more financial products or services and the frequency with which they are used. Consumer protection includes transparency in information on financial products and services, protection of user information and personal data, protection against abusive commercial practices by the financial institutions and access to the resources needed to claim when required. Finally, financial literacy refers to the ability to evaluate and take the right financial decisions; to know where and how to look for and choose a financial product that adapts to the user's financial needs, as well as the understanding of rights and obligations imposed by a contract for a financial product or service.

The lack of financial inclusion or access to the financial system[1] is due to supply and demand factors. On the supply side market failures such as asymmetrical information[2], monopoly or oligopoly in the financial market and entry barriers to new competitors and/or products mean barriers for a part of the population that is excluded for reasons of price, risk and/or reduced supply (Claessens, 2006). On the demand side Beck and De la Torre (2006) suggest that price and income are the most notable economic determinants of demand for payment and saving services. Economic development and the associated raise in per capita income, increases the need for more sophisticated services. However, incentives to demand do not only come from economic factors, but also socio-cultural ones such as traditions or religion, which may lead to voluntary exclusion (Claessens, 2006), i.e. to a person's own decision not to use and not to be interested in using the financial system[3].

Despite the fact that authors such as Beck and Demirgüç-Kunt (2008) point out that people who have access but decide not to use financial services constitute a smaller problem, as their lack of use reflects zero demand, there are few studies that analyze the reasons for financial exclusion from the demand point of view, whether voluntary or involuntary. Demirgüç-Kunt and Kappler (2012) and Allen et al. (2012), using data from the World Bank's Global Findex survey, are the authors who have studied the causes of financial exclusion in most depth. These authors use as a proxy the reasons why the population over the age of 15 does not have an account in a financial institution. The analysis covers 148 countries, including Mexico. The most important barrier, according to this measurement, is lack of money (66% of the people argue this reason) and the variables that increase the probability of perceiving this

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1: By access to the financial system we mean both to the bank infrastructure and the existence of appropriate products that make the effective use of the system easier

2: The problems of imperfect information in the financial market are adverse selection, moral risk and credit rationing (Stiglitz and Weiss, 1981). Adverse selection occurs when one of the agents has more information than the other before the economic transaction. This makes decisions in the market difficult or distorts them; moral risk is a problem of private information, in which an agent incurs in actions that the other agent does not know or control and that lead to consequences to the latter; credit rationing is produced by the two previous failures and means that financial intermediaries do not place all the funds that the market requires.

3: According to the survey of BBVA Bancomer and GAUSSC (2012) in Mexico, 18% of the population does not use and is not interested in using financial services. For more information, see BBVA Research (2012) Banking Watch Mexico.

barrier are: belonging to the low and middle-income quintiles, being part of a bigger household, and being unemployed. In line with these results, for Mexico Djankov et al. (2008), using data from the Bank for National Savings and Financial Services (BANSEFI), find that 89% of people without access to the financial system argue they "do not have sufficient money".

Financial inclusion[4] allows households and companies to finance themselves through credit (Rajan and Zingales, 1998, Khandker and Pitt, 1998), and administer or mitigate risks through saving and insurance (Collins et al. (2009; World Bank, 2008); while the negative consequences of exclusion (Mitton, 2008) include a higher interest rate on loans, lack of insurance and risks associated with the insecurity or inflation. All this evidence makes clear the need to go into more depth in the study of the demand barriers for the access and use of financial services.

Given the above, this document aims to explore the factors that influence the decision not to use formal financial services in Mexico. To do so, it analyzes the data for the National Financial Inclusion Survey (ENIF) carried out by CNBV, the National Institute of Statistics and Geography (INEGI), and the Alliance for Financial Inclusion (AFI) in 2012. The ENIF survey provides very valuable information that allows us to analyze elements of financial inclusion that have not been studied before due to lack of detailed information at individual level.

This study is made up of four sections in addition to this introduction: the first outlines the policies of financial inclusion in Mexico; the second contains a succinct description of the ENIF survey; the third develops the methodology for analysis and results; and the final section presents conclusions and recommendations.

4: Other empirical studies, mainly about impact evaluation, indicate other advantages of financial inclusion, such as reduction of poverty (Burgess and Pande, 2005), incentives to formality (Beck et al., 2011) and increased consumption and productive investment (Armendariz and Morduch, 2005).

1. Public financial inclusion policies in Mexico

The regulatory changes to the Mexican financial sector since 2008 have encouraged the appearance of new participants in the financial system and the generation of new business formulas in accordance with the needs of the regions and social sectors that are still not receiving enough attention. This process is taking place in a market in which there are three types of institutions offering financial services (Peña and Vázquez, 2012):

i.   Formal regulated financial institutions: banks, credit unions, financial cooperative associations, development banks, credit unions and multi-purpose financial companies linked to a financial group (regulated Sofomes)[5];

ii. Formal unregulated financial institutions: multi-purpose financial companies not linked to a financial group (unregulated Sofomes) and pawn shops;

iii. Informal financial institutions: "tandas" (ROSCAs)[6] and speculators.

The presence of the three types of intermediaries varies between urban and rural areas. For example, according to the Fourth Financial Inclusion Report from the Mexican National Securities Market Commission (CNBV) (CNBV 2012a), in some rural areas[7] there is no bank presence, since the volume of transactions cannot offset the costs of opening and maintaining a branch; therefore, other formal intermediaries such as credit unions have to some extent met the demand for financial services in those areas, although in others the formal financial system is still not represented[8].

In this context, the CNBV has headed up regulatory changes aimed at ensuring that the greatest numbers of people have the possibility of benefiting from the financial system through the appropriate use of financial products and services. The main changes in regulation for creating incentives for financial inclusion have been the following (CNBV 2012b):

i.   Revision and adaptation of the regulatory framework of the popular saving and loan sector (2008)[9].

ii. Incorporation of non-banking correspondents for the provision of financial services (2008).

iii. Financial services through mobile banking (2009)[10].

iv. Simplification of the requirements for opening a bank account - simplified accounts (2010).[11]

v.   Promotion of competition between banks through the creation of niche banking[12] (2008 and 2009).

5: Sofomes (Sociedades Financieras de Objeto Múltiple) are financial institutions that obtain funds through financial institutions and/or public debt issues, grant credit to the public in various sectors and carry out financial lease operations and financial factoring, though they may not gather funds from the public.

6: This is a form of informal saving, without any guarantee, in which a group of friends or family members contribute a certain amount of money regularly (for example, once or twice a month). The total collected during a period is given to each of the members by turns. In international parlance, they are called rotating savings and credit associations (ROSCAS).

7: As of July 2012, 71% of towns had at least one channel of access to financial services. The population of these towns accounts for 97% of the adult population of Mexico.

8: See Banco de Mexico (2013). Reporte sobre el Sistema Financiero Mexicano (Report on the Mexican Financial System), September 2013

9: Although since 2001 the law on Savings and Popular Credit (LACP) has been published, in 2008 this law was modified to regulate "sociedades financieras populares" (financial cooperative associations). In 2009 and 2012 the Law Regulating the Activities of Cooperative Saving and Loan Companies (LRASCAP) was reformed and the LACP and the General Law on Cooperative Saving and Loan Companies (LGSCAP) were amended.

10: See BBVA Research (2011), Banking Watch Mexico, November 2011.

11: There are four levels of accounts according to the potential levels of risk of money laundering and fraud: the "traditional or full procedure" accounts are classified as level 4 accounts, which have no limit to the deposits that can be received and allow the use of checks for making payments; the level 1 to 3 accounts are considered "simplified procedure", low-risk accounts, since, in line with the amount of customer information that can be collected by the bank, limits are placed on the monthly deposits that can be received.

12: Credit institutions subject to the same regulations and supervision as traditional banking, but with minimum capital requirements that depend on the operations expressly included in their company bylaws, the infrastructure necessary for their development and the markets in which they intend to operate.

According to the CNBV (2012b), regulation on financial inclusion aims to generate more flexible conditions in markets, and at the same time, to guarantee the security and integrity of transactions, as well as prudential conditions for the financial system as a whole; so that an innovative range of financial services can be offered that are closer to the needs and scope of people.

With the progress made in regulatory matters, 71% of municipalities now have at least one channel of access to financial services (branch, ATM or correspondent) for commercial banking, development banking, cooperatives and microfinance institutions, meaning that 97% of the adult population has access. With respect to other indicators of access to financial services in Mexico, the Fourth Report on Financial Inclusion has calculated 1.83 branches per 10,000 adults, of which 81.4% are commercial banks, 3.8% development banks, 7.9% cooperatives and the remaining 6.9% microfinance institutions. The report also indicates that for every 10,000 adults there are 65.41 point of sale (POS) terminals, 9.08 points of access for withdrawals and deposits, 2.64 correspondents, 4.61 ATMs, 13.63 cell-phone banking contracts (the system is still in its initial phase), and 2,103 users of online banking.

As well as actions in the regulatory area, the strategy of the financial authorities to narrow the gap between supply and demand for financial services includes activities to measure systematically and consistently the level of financial inclusion. The measurements are tackled from a use perspective, such as access, considering different segments and market needs. Thus the measurements provide a mechanism for evaluating public policies for promoting greater financial inclusion and offer information to the market on possible business opportunities for developing new products and services.[13]

2. The National Financial Inclusion Survey (ENIF)

In order to have information about the use of financial products and services from the user's point of view, as well as finding out the barriers to greater use of these services, the CNBV, in coordination with the INEGI and AFI, developed the ENIF survey, which was carried out for the first time in 2012.

The ENIF generates information about the characteristics and needs of users and non-users of formal and informal financial services, as well as the barriers that limit access and the use of the formal financial system. These data are very valuable for analyzing financial inclusion on the demand side and for designing public policies related to the use and access to financial services.

Previously, the measurement of financial inclusion used information related to supply, and was thus not useful for measuring demand aspects. To characterize demand, efforts have been made since 1993 to measure the use of financial services by the Mexican public[14], but these surveys are not comparable between each other, are not sufficiently representative and lack data that allow a more in-depth study of financial inclusion. That is why the ENIF has been created as a pioneering survey in Latin America. It is a fundamental element for research into financial inclusion.

The survey is representative at national level, at the household level and for individuals, as well as by gender, towns with a population of more than 15,000 and with a population of less than 15,000. The people surveyed were adults aged from 18 to 70, selected at random from 7,016 sample homes. The sample design allows us establish inferences at household level and

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13: For more details on the measurements of financial inclusion in Mexico, see CNBV (2012). Libro Blanco de Inclusión Financiera
14: Survey on financial systems in semi-urban and rural populations (1993), the National Survey of Rural Financial Markets (2002), the National Survey of Household Living Standards (2002 and 2005-2006), the Panel Survey of Households on saving, popular credit and rural microfinance (2004-2007), the Survey on Financial Culture in Mexico (2008), the Survey on the use of Financial Services (2007 and 2009), the Survey on preferences and needs of users of financial products and services in the popular saving and credit sector (2010).

for 70.4 million adults, of whom 54% are women and 46% are men. The sample is probabilistic, three-stage, stratified by conglomerates.

Among the key surveys used to measure financial inclusion, the ENIF is clearly more extensive in scope and more detailed for the Mexican population than the Global Findex, which is the survey covering financial inclusion issue with the greatest coverage in the world (148 countries). A comparison can be seen in the following table:

Table 1

Methodological comparison between Global Findex and ENIF

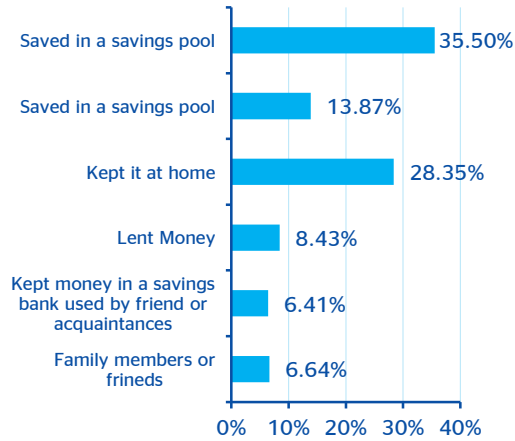|	**ENIF 2012**	**World Bank Global Findex 2011**
Sample size	7,016 interviews	1,000 interviews
Representativeness	National, in towns with a population of 15,000 or over and under 15,000, as well as by gender	National
Population under study	Population 18 to 70 years of age	Population 15 years of age and over
Method	Face-to-face in homes	Face-to-face in homes
Population with bank account	35.5%	27%
	Question: "Do you have a savings, payroll, investment or any other account at a bank?"	Question: "Do you currently have a personal or joint account at any bank or any other financial institution, such as a cooperative?"
Population with a credit card	25%	13%
	Question: "Do you have a bank credit card?"	Question: "Do you have a credit card?"

Source: BBVA Research with ENIF and Global Findex data

Some descriptive results of the ENIF survey provide information worth highlighting on access to the formal and informal financial system and the use of saving and credit products. In terms of the number of people with an account or credit[15] in a financial institution, 37.9% of the Mexican adults are users of banking services. With respect to formal saving, 35.5% of adults are linked to a financial institution, the two major products being payroll accounts and savings accounts, at 60.5% and 46.6% respectively. In the area of formal credit, 27.5% of adult Mexicans use some credit mechanism, above all store credit cards, which is the most popular product (54%), followed by bank credit cards (25%), personal loans (10%) and payroll loans (7%).

The informal market is used by 43.6% of adults for saving and 33.6% to obtain credit; in the case of saving, saving at home (28.3%) is particularly important, and the family is the main supplier of informal lending (19.3%). Loans between family and friends are the most common way of obtaining funds (67.4%), followed by pawning items (36.3%), using savings (34.9%) or requesting an advance on wages (22.4%).
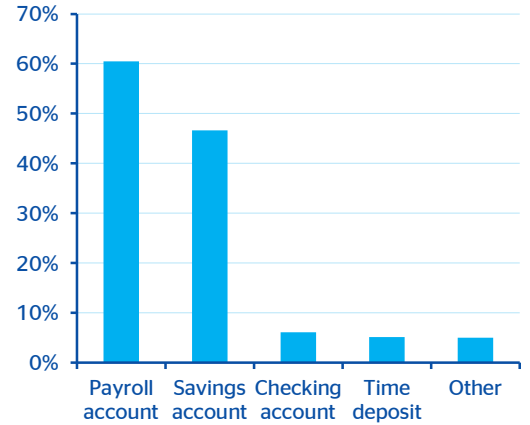

15: Formal credit does not include store credit cards, as this does not constitute a relationship with financial institutions. Also not included are communal credits, as they are forms of credit that are normally applied by microfinance institutions or other kinds of institutions in which their formal character cannot be clearly established. If these two forms of credit were included the percentage would increase to 48.3%.
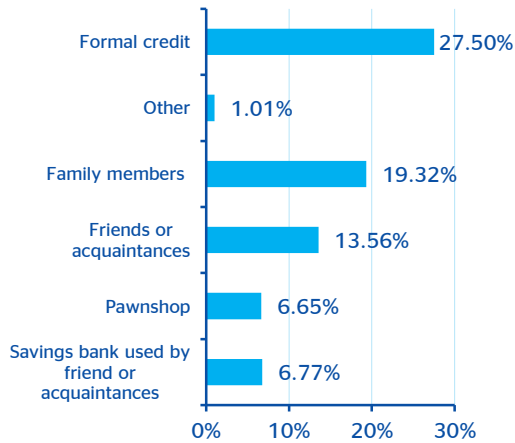
Chart 1
Sources of savings (% adult population)

Category	Value
Saved in a savings pool	35.50%
Saved in a savings pool	13.87%
Kept it at home	28.35%
Lent Money	8.43%
Kept money in a savings bank used by friend or acquaintances	6.41%
Family members or frineds	6.64%

Source: BBVA Research with ENIF 2012 data

Chart 2
Means of formal saving (% users)

Categories: Payroll account, Savings account, Checking account, Time deposit, Other

Source: BBVA Research with ENIF 2012 data

Chart 3
Sources of credit (% adult population)

Category	Value
Formal credit	27.50%
Other	1.01%
Family members	19.32%
Friends or acquaintances	13.56%
Pawnshop	6.65%
Savings bank used by friend or acquaintances	6.77%

Source: BBVA Research with ENIF 2012 data

Chart 4
Means of formal credit (% users)

Categories: Store credit card, Bank credit card, Personal credit, Payroll credit
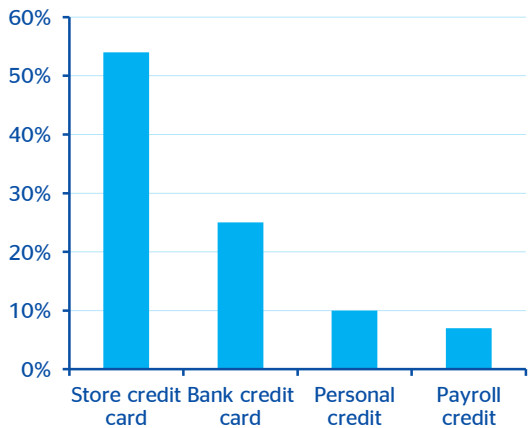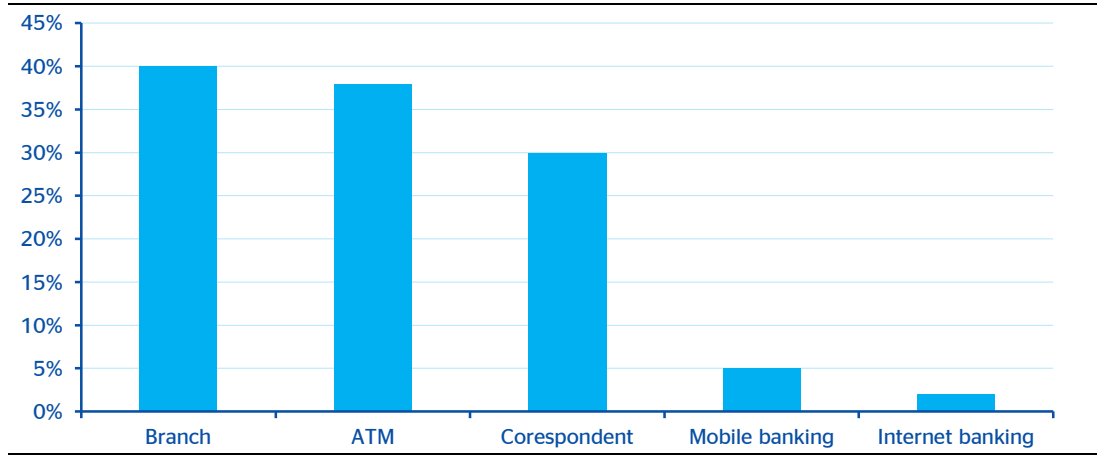
Source: BBVA Research with ENIF 2012 data

The most commonly used channels of access to the financial system are still bank branches (40%) and ATMs (38%), which are mainly used for three operations: cash withdrawals, deposits and balance inquiries. Some 30% of the population use banking correspondents, while cell-phone banking and online banking are only marginal, at 5% and 2% respectively.

Chart 5
Use of channels for accessing the financial system

Source: BBVA Research with ENIF 2012 data

3.Barriers to financial inclusion in Mexico: methodology and results

3.1. Methodology

We have estimated probit models *to study the factors that create barriers for accessing financial services on the demand side*. This type of econometric analysis is frequently used to determine the probability that an individual or entity with certain characteristics belongs or does not belong to the group that is being studied. Probit models are binary classification models where the dependent variable is dichotomous and takes the value 0 or 1.

In this analysis the probit models take as the dependent variable, y_i , the perception of barriers to the use of financial services (1 if the person perceives the barriers and 0 if not); the unit of the study is the individual. Let us assume that the perception of barriers to access and use depend on a latent variable y^* which is determined by a set of exogenous variables, included in vector x', so that :

$$y_i^* = x_i'\beta + u_i$$

$$y_i = 1 \text{ si } y_i^* > 0 \text{ ; } y_i = 0 \text{ si } y_i^* \leq 0$$

where the subscript i represents individuals. The vector represents the parameters of the model and u is a normal distribution error term of average 0 and variance 1.

A critical threshold y_i is assumed, based on which, if y_i^* is over y_i then an individual is in the financial system. This threshold y_i^*, similarly to y_i, is not observable; however, if we assume it is distributed normally with the same average and variance, it is possible to estimate the regression parameters and thus obtain information on y_i.

$$P_i = P(y_i = 1|x') = P(y_i \leq y_i^*) = P(Z_i \leq \beta x_i') = F(\beta x_i')$$

where Z is a standard normal variable, $Z \sim N(0, \sigma^2)$ and is the cumulative normal distribution function.
$$F = \left(\frac{1}{\sqrt{2\pi}}\right) \int_{-\infty}^{\beta x_i'} e^{-Z^2/2} \, dz$$

We conduct a maximum-likelihood estimation as a series of probit models. The marginal effects on the latent variable are calculated from the different coefficients estimated in the models. The interpretation of these marginal effects is similar to that obtained in the linear regression models, where the coefficients represent the change in the probability of having a specific barrier to effective access to the financial system when a variable x_i belonging to the vector of exogenous variables x' changes, maintaining the other factors fixed, given that $E(y^* \mid x') = x'\beta$.

Variables included in the model

The model considers both endogenous and exogenous variables. With respect to endogenous variables, the analysis of barriers using endogenous variables is based on the ENIF questions referring to the reasons for not having an account or credit at a financial institution. These questions[16] are classified into 4 categories according to the options in the answer: 1) is not interested or does not need the financial product; 2) has insufficient or variable income; 3) reasons associated with access (distance, costs, requirements); and 4) personal reasons (does not trust banks, prefers informal saving, does not like to be indebted or believes that he or she will be refused). A probit model was created for each of these categories using the exogenous variables described below.

The exogenous variables consider those that in accordance with the literature and availability of ENIF data may influence financial inclusion. Below is a brief description of the variables included in the probit models and the reasons for using them[17]:

Gender: Access to the financial system is different for men and women; while in developed countries 37% of women have an account in a financial institution; this figure is 47% for men. In Mexico, the ENIF shows that 42% of men use formal saving and only 30% of women do so. Numerous studies and measurements (Allen et al. 2012, Johnson, 2004) have demonstrated that women have fewer possibilities of accessing formal financial services, so most social interventions (programs for conditional transfers, financial literacy, financial inclusion) are focused on promoting financial inclusion among women (Samaniego and Tejerina, 2010; De los Ríos and Trivelli, 2011). For the model estimated, gender is included as a dummy variable for women.

Age: In accordance with Modigliani's life-cycle theory, people tend to consume less as they get older, so they accumulate savings during their adult life and de-accumulate in youth and old age. This theory would mean that the level of financial inclusion is greater among people who are middle-aged. It is thus interesting to see the behavior of this variable in the Mexican context. The model takes the age of the individual and the age squared to check if the life-cycle theory is confirmed.

Characteristics of the household to which the person belongs: The size of the household, the position within the household and the marital status are basic variables that are related to access and use of financial services. The greater size of a household tends to be related to less possibility of access. Cano et al. (2013) demonstrates that for Colombia the size of the household reduces the possibility of being in the financial system; while married men are more likely to be users of banking services, which coincides with the estimate of Allen et al. (2012) for countries included in the Global Findex survey. In the model these variables are taken as dummy variables for the head of household and married people or those who live as part of a couple.

Educational level: Education is a variable that is frequently used for analyzing financial decisions, due to its association with financial knowledge, and as it is a proxy for financial literacy. Authors such as Mitton (2008), Demirgüç-Kunt and Kappler (2012), Kempson et al. (2013) and Djankov et al. (2008) show that both at global level and in Mexico, a higher educational level increases financial inclusion. Dummy variables for primary education or below, secondary and higher education are used for the model.

16: Questions 5.4 and 6.5 of the ENIF: "Why don't you have a bank account?" and "Why don't you have a loan, credit or credit card?"
17: For more details about the source and the description of each variable, see Appendix 1

Occupation: This category includes the type of activity of individuals. It is modeled on three classes of dummy variables: employed workers, inactive workers or the population of an age to work who are not looking for a job, and domestic workers or homemakers[18].These variables are common in the studies that model financial inclusion at microeconomic level (Allen et al. 2012, Djankov et al. 2008).

Saving and remittances: Saving is understood in a broad sense, in other words if the household "has money spare after covering expenses". This surplus may be used for anything, so it is not a variable related to banking penetration.[19] The receipt of remittances in the household is an important variable for the Mexican case, given that money from remittances accounts for 2% of GDP. The relationship between financial inclusion and remittances was initially modeled by Anzoategui, Demirgüç-Kunt and Martínez Pería (2011) for El Salvador. The study finds that the probability of having some kind of relation with the financial system increases when the household receives remittances. Remittances are a dummy in the estimated model, based on the answer to whether people receive remittances from other parts of the country or abroad.

Capacity for dealing with exogenous shocks: Theoretical technical discussions in favor of financial inclusion emphasize that saving and insurance boost living standards due to the possibility of mitigating risks (Collins et al. 2009, World Bank 2008). This is particularly relevant for the vulnerable population, which when hit by shocks falls into poverty or precarious situations that reduce their living standards. A proxy variable was constructed to measure this aspect in the model represented in a dummy based on the question *"If you had a financial emergency today amounting to what you earn or receive in a month, could you pay it?"*

Income: The relationship between income and financial inclusion is clear in most of the studies on financial inclusion; the fact that 62% of the financially excluded are poor[20] is clear evidence of this relationship. Both Allen et al. (2012) at global level, and Djankov et al. (2008), Kedir (2003), Murcia (2007) and Cano et al. (2013) take into account income levels and find a direct relationship between higher incomes and financial inclusion. For the model, only the income from work is used, as the ENIF does not provide information on income from other sources than work. This is a limitation, as it underestimates the wealth of the individuals.

The size of the town or city where the individuals live: A geographical analysis in various large countries such as Mexico is essential. Some studies (Kedir, 2003; Murcia, 2007) that include this dimension in the models related to financial inclusion find differential effects according to the location of individuals, which is associated with infrastructure characteristics, distance and natural barriers that limit or facilitate access to the financial system. Given that the ENIF does not have available the figures on location by urban/rural zone, the differentiation of small towns (under 15,000 people) and large towns (over 15,000 people) is an essential variable in the model.

3.2. Results

According to the ENIF, 62% of adults in Mexico aged between 15 and 70 are not included in the financial system, in other words they do not have a current, payroll or savings account, or credit at a formal financial institution. The main access barrier to the financial system is income: 77% of the people "excluded" say they do not have sufficient income or that their income is variable and does not allow them to have an account or credit at a formal institution. The second reason alleged by 47% of those not using banking services is that they are not interested or do not need a financial product, which could be considered a position of self-exclusion. Personal reasons are argued by 24.2% of those who are not linked to the financial system, and reasons of access are those alleged by fewest, at 21%.

18: The category of unemployed is not included because the percentage of people in this category was only 1% in the ENIF; however, the variable of domestic worker was included, as 20% of the population is in this area of activity.
19: This correlation was verified with the endogenous variables used in the model and was not found, see Appendix 2.
20: Data from Global Findex for the poorest quintile in the 148 countries included in this measurement. In developing countries the figure increases to 75%.

The results of the probit model are robust at individual and aggregate level and show that there are distinct variables that influence in each of the four barriers analyzed (see Table 4). Only the household saving variable is significant statistically to explain the likelihood of being subject to the four barriers; however, the relation sign varies in each. In contrast, the variables of household size, being married or living as a couple, and income between 5,000 and 7,999 pesos are not significant individually in any of the models estimated.

Barriers of insufficient or irregular income

According to the probit model, this barrier is most common for people who can respond to exogenous shocks and those who save. In the case of the former, the probability falls by 17% compared with individuals incapable of dealing with shocks and 14.7% compared with those who do not save. These results are within expectations, as the capacity to save and to deal with unforeseen factors corresponds to people who have the possibility of accumulating funds and thus are less likely to be limited by their income. Women have 3% less probability than men to argue low income as a barrier. Although this information surprises at first glance, it is not strange, as the programs, policies and initiatives of financial inclusion are directly or indirectly focused on women[21], and this can lead women to perceive that income is not a barrier for using the financial system.

The variables that increase the probability of perceiving low income as a barrier are, as expected, related with income: individuals without income from work are 7.4% more likely to claim this barrier than people with income. Employment also influences in the perception of an income barrier. Homemakers and those not in the labor force have 8.4% and 7.8% less likelihood, respectively, than other categories of the active population. In the same way, lower educational levels increase by 10% the probability of feeling a barrier in the case of primary studies and 4% in the case of secondary education, compared with people who have higher education. Being head of the household also increases the probability of perceiving the barrier by 3.5%, which may be because they have family members who depend financially on them. Although the ENIF cannot establish the number of people who depend on each person receiving an income, the question referring to the contribution of income to the household gives a clue to economic dependence: 91.8% of heads of household say they contribute to household expenses, while only 54.8% of other household members do so. In addition, 60% of heads of household are the only ones who pay the household expenses with their income.

The geographical factor is also clear. Those who live in towns with a population under 15,000 have 6% more probability of feeling the low or variable income barrier compared with residents in larger towns. This may be due to the characteristics of small towns, such as agriculturally based economies in which income is seasonal and associated with harvests.

Barrier of no interest or no need for saving and/or credit services (self-exclusion)

This barrier is more probable if people can deal with exogenous shocks and/or save. The probability of "self-exclusion" increases by 7% for people who are able to deal with shocks, compared with those who cannot. At the same time, individuals in households with money to spare are 4% more likely to perceive this barrier compared with people without saving. This could be reflecting the preference for the informal market. With respect to credit, the recent study by Campero and Kaiser (2013) suggests that in Mexico there is evidence that people value the informal market highly when households face negative shocks. Family and friends play an important role in income shocks. This coincides with answers in the ENIF: in case of an emergency, Mexicans usually turn to loans from families and friends (67.4%) or use an asset of some kind (36.3%). The above data back the hypothesis of preference for informal

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mechanisms, as they show the relationship between the perception of no interest or no need for formal saving and credit services and the use of the informal market.

The other statistically significant variables for this barrier have a negative coefficient. Being a woman reduces by 5.6% the likelihood of self-exclusion compared with men. Although this relationship may appear strange, studies such as that by Dupas and Robinson (2009) show that women excluded from the financial system show greater interest in using financial services when they are made available to them. In other words, they do not exclude themselves, but rather their unfavorable position with respect to men in terms of financial inclusion is due to other elements.

People with lower income also have 8% less likelihood of not being interested in financial services, compared with those who receive more than 8,000 pesos per month as income from work. This result indicates that although people with lower incomes suffer more from financial exclusion, this is not their own decision. As demonstrated by recent studies (Banerjee and Duflo, 2007; Karlan et al. 2013), people on low incomes save and have a latent demand for saving products appropriate to their needs; in Mexico the evaluation of the impact of expansion by the National Saving Trust (the predecessor of BANSEFI)[22] between 1992 and 1994 points to a positive effect (of between 3% and 5%) in the saving rate of low-income households. This result is not seen in households with higher incomes (Aportela, 1999). The above indicates that the exclusion of the low-income population responds more to exogenous barriers, and could be related to what Claessens (2006) calls involuntary exclusion for reasons of price, risk, discrimination or the nature of the financial product.

Finally, as age increases the likelihood of not being interested in financial services falls, but this trend has a turning point (54 years), which is reflected in the positive sign for age squared, in other words at a particular point in life the probability of perceiving that it is not necessary to have financial products increases, which would be in line with the life-cycle theory.

Barrier of mistrust, fear at being rejected, refusal to be in debt or preference for informal saving (personal reasons)

This barrier is 10% less likely for individuals without income than for those who have some kind of income from work. This result is the contrary to what is observed in the low-income barriers, and is linked to the fact that without income there is less likelihood of deciding about savings or credit of any kind. The variable of belonging to households with savings and capacity to deal with shocks increase by 12% and 5.4% respectively the likelihood of giving as a reason the barrier in question, compared with people in households without saving and those who cannot deal with shocks. The two first coefficients are coherent with the results of the self-exclusion model and provide indications that people with some type of funds, compared with those who do not have them, may consider the option of not using the formal financial market. Among the reasons that could lie behind these personal decisions could be the familiarity, simplicity and speed of the informal financial mechanisms compared with distrust of formal financial institutions and the fear of being refused by them. In relation to this latter aspect, according to data from the ENIF, 14% of households with money to spare and 13.8% of those who have the capacity to deal with shocks say they have been refused before when they applied for a loan. In both cases the percentage is 2% higher than for individuals in households without savings or that cannot deal with shocks. This shows that the fear may be based on prior experience of contact with the financial system.

Finally, the coefficient of the variable that identifies homemakers shows that this condition increases the likelihood of arguing personal reasons as a barrier to financial inclusion by 10% compared with people who dedicate their time to other things. The result supports the

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22: The expansion of PAHANAL included opening 99 branches in 34 towns, 27 of them without a financial institution. As well as increasing the coverage, the bank introduced savings products "Cuentahorro" and "Tandahorro", focused on making saving easier for lower-income population. As of December 1994 these two saving products accounted for 83.6% of the bank's balance sheet. Aportela (1999)

suggestion of barriers derived from lack of interaction outside the home (Demirgüç-Kunt et al. 2013) and the lack of autonomy, which may derive from economic circumstances.

Barriers of distance to the point of access, costs (fees, interest rates) and requirements (reasons for access)

Although this barrier is very important at global level,[23] in the case of Mexico it is being overcome, according to the results of the ENIF. The barrier is 5.8% more likely in towns with a population under 15,000 than in towns with a bigger population. This finding is clearly related to the concentration of financial services in places with a higher population and the fact that in Mexico 29% of the towns still do not have access to the financial system. As pointed out by the CNBV (2012b) in Mexican towns with a population under 50,000 no channel of access provides total coverage.

In addition, the variable of people in households with money to spare increases the likelihood of perceiving the barrier by 5.2%; the coefficient once more may be capturing the preference for the informal market, as mentioned earlier for personal barriers.

Finally, people who receive remittances have 4% less probability of claiming supply reasons than those who do not receive them. The coefficient is in line with the findings of Anzoategui, Demirgüç-Kunt and Martínez Pería (2011), who estimate that receiving remittances increases the likelihood of using financial channels, so it may be interpreted as mechanism for introduction to the financial system and reducing the perception of barriers to supply.

Table 2
Probit model on barriers to financial inclusion

	Not interested			Low income			Access reasons			Personal reasons		
	Coeff.	Error	Sign.	Coeff.	Error	Sign.	Coeff.	Error	Sign.	Coeff.	Error	Sign.
Woman	-0.056	0.025	**	-0.036	0.020	*	0.016	0.020		0.022	0.023	
Age	-0.010	0.004	**	0.001	0.004		0.005	0.004		0.001	0.004	
Age squared	0.000	0.000	*	0.000	0.000		0.000	0.000		0.000	0.000	
Size of household	-0.005	0.005		0.001	0.005		-0.004	0.004		0.002	0.005	
Head of household	-0.033	0.024		0.035	0.020	*	-0.004	0.020		0.008	0.022	
Married or in couple	-0.037	0.023		0.023	0.019		0.003	0.019		-0.012	0.020	
Primary education	-0.010	0.032		0.104	0.024	***	-0.026	0.026		-0.006	0.030	
Secondary education	-0.010	0.030		0.042	0.023	*	0.000	0.024		-0.009	0.027	
Homemaker	-0.024	0.052		0.084	0.037	**	0.027	0.051		0.102	0.051	**
Inactive	-0.032	0.054		0.078	0.035	**	-0.009	0.049		0.030	0.052	
Receives remittances	-0.025	0.033		0.000	0.028		-0.040	0.023	*	-0.002	0.029	
Household saves	0.043	0.023	*	-0.147	0.020	***	0.052	0.018	***	0.120	0.021	***
Capacity to deal with shocks	0.077	0.023	***	-0.175	0.021	***	0.004	0.018		0.054	0.021	**
Town with a population of under 15,000	-0.011	0.020		0.062	0.017	***	0.058	0.017	***	0.021	0.019	
Income under 3,000 pesos	-0.082	0.044	*	0.153	0.030	***	-0.002	0.038		-0.011	0.040	
Income of 3,000 to 4,999 pesos	-0.081	0.046	*	0.069	0.031	**	-0.001	0.040		0.019	0.044	
Income of 5,000 to 7,999 pesos	-0.015	0.056		-0.004	0.043		0.065	0.051		-0.008	0.051	
No income	-0.021	0.044		0.074	0.031	**	-0.034	0.037		-0.106	0.037	***
Comments	3826			3826			3826			3826		
Wald chi2(18)	74.200			394.34			41.93			73.55		
Prob>chi2	0.000			0.000			0.000			0.000		
Pseudo R2	0.021			0.1411			0.0132			0.0229		

***Significance to 99%; **Significance to 95%; *Significance to 90%.
Source: BBVA Research calculations based on ENIF 2012

23: According to Global Findex, 25% of people without an account in a formal financial institution feel the cost of services is a barrier, 20% the distance to the branch and 18% the documentation required.

4. Conclusions and recommendations

In Mexico 37.9% of adults aged between 18 and 70 are linked to the formal financial system through savings or credit products. This means that more than half of the population is excluded from the financial system for supply and demand reasons.

Regulatory changes since 2008 have allowed the entry of new actors and products onto the financial market. Thanks to this, 97% of Mexican adults now have access to some kind of financial channel (branches, ATMs or correspondents). However, this has still not been translated into an effective use of formal financial products, so there are demand reasons that are still determinant for increasing financial inclusion in the country.

Based on the information of ENIF 2012, an analysis was carried out of the factors that determine access barriers to financial services on the demand side. An econometric probit model was used to estimate the probability that an individual with certain socio-demographic characteristics is affected by barriers of insufficient income, self-exclusion, personal reasons or distance.

Our analysis shows that in Mexico the most important barrier for access to financial services is lack or variability of income, and the determinants are basically factors of vulnerability such as employment situation and income associated with this. The second most important variable for Mexicans is self-exclusion. However, the model estimated reflects that women and people with lower incomes, who are traditionally excluded from the financial system, tend to be less financial self-excluded and thus the reasons for not participating in the financial system may be modified with public policies, new products and alternative access mechanism that are adapted to their needs.

The barrier of personal reasons indicates that homemakers require special attention in initiatives that bring them closer to the financial sector, as the lack of trust or fear of financial institutions are aspects that can be eased with more information, mechanisms increasing approachability of financial institutions and products that are appropriate for these types of people.

The results with respect to the four barriers give indications of the preference of the Mexican population for informal mechanisms for saving and credit, as people with a capacity to deal with shocks or who belong to households that have money to spare are more likely to perceive barriers[24] to using banking services compared with households without the capacity to deal with the shocks or that do not accumulate savings. In addition, although the educational level is only significant in the barrier of insufficient income, the extensive use of the informal market may be related to the lack of financial literacy and the lack of knowledge regarding formal saving and credit products. This means awareness has to be raised with respect to the advantages of the financial system and financial literacy for being able to take informed decisions on participating in formal financial markets. Various studies by international bodies, among them the World Bank's Survey of Financial Capabilities 2012, have demonstrated that financial capabilities allow individuals to develop skills, knowledge and understanding on how financial services operate, so they are capable of managing their personal finances adequately, given the complexity of the tools and products available in the market.

Finally, it is important to highlight the importance of encompassing the smallest towns within the financial system. To do so, progress has to continue on regulatory changes that favor universal access and innovation in sustainable financial channels and products in order to provide the best possible supply of products and services for the population.

24: Campero and Kaiser (2013) point out that in Mexico there is evidence of complementarities between the formal and informal credit markets, with the informal market being more highly valued when households have to deal with negative shocks.

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Appendix 1

Table 3
Description of the variables

Variable	Question in the form	Definition
Barrier of insufficient or variable income		Dummy: 1 if answers in 5.4 that it is not within his/her scope, has insufficient or variable income (1) or in 6.5 Does not comply with requirements (does not have a job, insufficient income (4), 0 if does not have savings or credit products and gives another answer
Barrier of self-exclusion		Dummy: 1 if answers in 5.4 Does not interest or does not need it (2) or in 6.5 Is not interested or does not need it or has not applied (1), 0 of does not have the saving or credit products and responds to another option
Barrier of access	5.4 Why don't you have a bank account? 6.5 Why don't you have a loan, credit or credit card?	Dummy: 1 if answers in 5.4 The interest rates are low (3); the fees are high (4); They ask for things s/he doesn't have (6); the branch is far away or there isn't one (8); or in 6.5 the interest rates or fees are high (2); the branch is far away or there isn't one (8), 0 if does not have savings or credit products and responds another option
Barrier of personal reasons		Dummy: 1 if answers in 5.4 doesn't trust banks (5); prefers other forms of saving ("tanda" savings pools, keep it at home, etc.) (7); or in 6.5 does not trust banks or they give bad service (3); does not like getting into debt (5); believes the banks will refuse him/her (6); and 0 if he/she does not have saving or credit products and responds another option
Woman	2.3 Is (NAME) a man. Is (NAME) a woman?	Dummy: 1 is women and 0 is man
Age	2.4 How old is (NAME)?	Age in years
Age squared	2.4	Age squared
Size of household	Total members of household	Number of people in the household to which the adult surveyed belongs
Head of household	3.1 Are you head of the household?	Dummy: 1 if head of household and 0 if not
Married or in couple	3.2 Do you at present...	Dummy: 1 if lives with partner (1) or is married (5) and 0 if not
Primary education	3.4 What is the last year or grade you passed at school?	Dummy: 1 if no level (0), pre-school (1) or primary (2) and 0 otherwise
Secondary education	3.4 What is the last year or grade you passed at school?	Dummy: 1 if reached secondary (3) technical with complete secondary (4) or normal (5) and 0 otherwise
Domestic worker	Condition of activity validated (constructed based on questions 3.5 and 3.6)	Dummy: 1 if works in domestic labors (50) and 0 otherwise
Inactive	Condition of activity validated (constructed based on questions 3.5 and 3.6)	Dummy: 1 if student, retired, disabled or does not work and 0 otherwise
Receives remittances	9.1 Do your family members or friends who live elsewhere send you money?	Dummy: 1 if receives money (1) and 0 if not
Household saves	4.2 Do you have money left over at the end of the month after paying household expenses?	Dummy: 1 if answers always (1) or sometimes (2) and 0 if not
Capacity to deal with shocks	4.3 If you were faced with a financial emergency today amounting to what you earn or receive in a month, could you pay it?	Dummy: 1 if yes (1) and 0 if not
Town with a population of under 15,000	Size of town	Dummy: 1 if town is classified as with a population of fewer than 15,000 (3 and 4) and 0 if not
Income under 3,000 pesos	3.8 How much do you earn or receive per month from your work, activity or business?	Dummy: 1 if less than 3,000 (1) and 0 if not
Income of 3,000 to 4,999 pesos	3.8 How much do you earn or receive per month from your work, activity or business?	Dummy: 1 if between 3,000 and 4,999 (2) and 0 if not
Income of 5,000 to 7,999 pesos	3.8 How much do you earn or receive per month from your work, activity or business?	Dummy: 1 if between 5,000 and 7,999 (2) and 0 if not
No income	3.8 How much do you earn or receive per month from your work, activity or business? 3.10 Do you contribute money to the household expenses?	Dummy: 1 if does not contribute money to household expenses and does not register income in 3.8, and 0 otherwise

Source: BBVA Reasearch

Appendix 2

Table 4
Correlation between the variables included in the model

	Low income	Barrier of access	Personal barrier	Woman	Age	Size of house-hold	Head of house-hold	Married	Primary	Secon-dary	Home-maker
Low income	1										
Barrier of access	-0.1149	1									
Personal barrier	-0.1789	0.2286	1								
Woman	0.013	-0.0144	-0.0044	1							
Age	0.1111	-0.0427	0.0142	0.0226	1						
Size of household	0.0451	0.0073	-0.0248	0.0389	-0.2455	1					
Head of household	0.0517	-0.0146	0.0094	-0.4384	0.2893	-0.2418	1				
Married	0.0756	0.0157	-0.0045	0.032	0.0965	0.1973	-0.0323	1			
Primary	0.1916	-0.0361	0.0002	-0.0321	0.4296	-0.034	0.1727	0.0845	1		
Secondary	-0.094	0.0316	-0.0083	0.0059	-0.3728	0.0663	-0.1174	-0.0276	-0.7639	1	
Homemaker	0.0428	0.0031	0.0083	0.5054	0.0653	0.0515	-0.3334	0.237	0.0645	-0.0119	1
Inactive	0.0142	-0.0247	-0.0374	-0.0753	-0.0408	-0.0507	-0.0348	-0.2107	-0.0526	-0.0254	-0.1853
Independent	0.0131	0.034	0.0219	-0.058	0.1409	-0.0275	0.1381	0.01	0.0192	-0.0028	-0.3314
Employer	-0.0769	0.0127	0.0244	-0.0798	0.0325	-0.0276	0.0705	0.0197	-0.0287	-0.0093	-0.0605
Unpaid	0.0229	-0.0099	0.0035	0.0274	-0.0111	0.0363	-0.0677	-0.0402	-0.0115	-0.0028	-0.0945
Remittances	0.0262	-0.0168	0.016	0.0781	0.0717	-0.055	0.0759	-0.0421	0.0545	-0.0438	0.0492
H_ saves	-0.269	0.0633	0.1096	-0.0575	-0.1802	-0.0614	-0.0293	-0.0641	-0.1592	0.118	-0.0446
Rpse. to shock	-0.2713	0.0357	0.0854	0.0058	-0.1727	-0.003	-0.0605	-0.0225	-0.1438	0.1044	0.0062
Small town	0.1487	0.048	0.0066	-0.0275	0.0006	0.105	0.0272	0.1022	0.2416	-0.0897	0.0721
Income <3,000	0.104	-0.0137	-0.0074	-0.1096	0.0411	0.0128	0.1446	-0.0661	0.1267	-0.0578	-0.4651
Income 3,000 to 4,999	-0.0649	0.0077	0.0268	-0.252	-0.0726	-0.0143	0.1503	-0.0344	-0.0876	0.0954	-0.2677
Income 3,000 to 4,999	-0.1345	0.0454	0.0028	-0.1624	-0.0397	-0.0315	0.0981	0.018	-0.105	0.0169	-0.1505

	Inactive	Independent	Employer	Unpaid	Remitta nces	H_ saves	Rpse. to shock	Small town	Income <3,000	Income 3,000 to 4,999	Income 5,000 to 7,999
Inactivo	1										
Independiente	-0.1638	1									
Empleador	-0.0299	-0.0535	1								
No remunerado	-0.0467	-0.0835	-0.0153	1							
Remesas	0.0224	-0.0115	0.0019	0.0166	1						
H_ahorra	-0.0594	-0.0418	0.0456	-0.0259	0.0018	1					
Resp._Shock	-0.0618	0.0009	0.0446	-0.0167	0.0018	0.3181	1				
Localidad pequeña	-0.1037	-0.008	-0.0231	0.0656	0.0437	-0.0661	-0.0545	1			
Ing.<3000	-0.2299	0.3691	-0.0252	-0.1172	-0.0037	-0.0622	-0.0414	0.1385	1		
Ing. 3000 y 4999	-0.1323	0.0321	0.0005	-0.0675	-0.0347	0.1018	0.0449	-0.1084	-0.3321	1	
Ing. 5000 y 7999	-0.0744	0.0151	0.0333	-0.0379	-0.0308	0.1085	0.049	-0.1037	-0.1867	-0.1075	1

Source: BBVA Research

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