

Effects of Financial Access on Savings by Low-Income People

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Abstract

This paper assesses the impact of increasing financial access on low-income people savings. Effects on households' saving rates and on different informal savings instruments are considered. The paper uses an exogenous expansion of a Mexican savings institute, targeted to low-income people, as a natural experiment and the 1992 and 1994 National Surveys of Income and Expenditures. Results show that the expansion increased the average saving rate of affected households by more than 3 to almost 5 percentage points. The effect was even higher for the poorest households in the sample: their saving rate increased by more than 7 percentage points in some cases. Furthermore, the expansion, in general, had no effect on high-income households. In the case of informal savings instruments, evidence of crowding out of these instruments caused by the expansion is limited. Results do not rule out the possibility that a considerable fraction of the increase in households' savings could have come from new savings.

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I. Introduction

Access to formal savings instruments is commonly assumed in the economics literature. Nevertheless, in developing countries, availability of these instruments for low-income people is not universal. Usually in these countries, opening a bank account has relatively high transaction costs and relatively high fees and commissions for this sector of the population. These impediments to save or savings constraints must have some impact on the individual's behavior. In spite of that, little is known about this issue.

According to conventional models of savings behavior, if people are constrained to save in certain instruments, they should be saving using alternative ways. Access to new and better instruments should imply a crowd out of the less attractive into the more desirable ones. The new level of total savings would depend on the relative weights of the substitution and income effects. Would this be the case of low-income people?

Actually, it is widely believed that low-income people do not save. However, empirical evidence has proven this to be wrong. Once suitable financial instruments are available to this group of people, they become eager and regular savers.¹ Nevertheless, no estimates of the precise effect of these instruments on individuals' savings behavior exist. At most, it is only possible to find descriptive and anecdotal evidence.

Also, it is not feasible to infer from the literature if these savings are new savings or if they came from informal instruments. In a related issue, it is not possible to know if low-income people were saving before formal savings accounts were available to them. Did they become eager and regular savers after access or they had those characteristics before? Moreover, is it possible to explain savings behavior of low-income people only with conventional savings models?

These are questions that do not have a good answer in the economics literature. This paper tries to give an answer to some of the main questions. It analyzes the effects of

¹ See for reference Mansell (1995) and Robinson (1992).

increasing financial access on the saving rate of low-income people and on the crowding of informal savings instruments.

Several factors make these questions highly relevant. First, given that borrowing constraints are more stringent for low-income people, a clear way to relax them is by mobilizing their savings into the formal financial sector.² Mobilization is highly dependent on the responsiveness of this group to financial developments.

Second, international institutions are interested in increasing financial access to low-income people. Empirical evidence shows that the success or long term viability of these programs depends on the responsiveness of people's total savings to this increment in access.³

Third, as mentioned before, lack of access to financial services could force households to adopt inefficient forms of savings. The range of informal instruments is wide. It can include from cash under the mattress to extreme forms that could even be children, especially with the purpose of providing old age support to the parents. This kind of behavior has important effects in fertility and in the perpetuation of poverty. The World Bank (1994) documents this issue and its effects.

To answer these questions, the paper uses the 1992 and 1994 Mexican National Surveys of Income and Expenditures. These surveys have detailed household level data. Also, the paper uses, as a natural experiment, an exogenous expansion of a savings institute targeted to low-income individuals to identify the effects of increasing financial access on the saving rate of households.

² Deaton (1990) remarks that savings are not only about accumulating assets but also about consumption smoothing, especially for low-income people.

³ Financial institutions for low-income people usually rely on subsidies to operate. Only those which effectively mobilized savings are subsidy-free, some of them with impressive results. For more on the subject see Morduch (1997).

The expansion included not only the growth in the number of branches but the development of new savings instruments. It was carried out in 1993 and comprehended only some cities in Mexico. Consequently, it is possible to use the saving rates of households located in non-expansion towns as a control to the experiment.

Results show that households located in towns that had an expansion of the savings institute had a saving rate that was on average 3 to 5 percentage points higher than the one of non-affected households. Furthermore, effects were stronger for low-income individuals in the sample. In some cases, affected low-income households had a saving rate that was on average more than 7 percentage points higher than other low-income families located in towns without expansion. The expansion, in general, had no significant effect on the saving rates of high-income households.

An important related question is whether expanded access had some impact on informal savings instruments. Using the savings institute's expansion, this paper explores the existence of crowding out of this type of instruments. Results showed no statistical evidence of displacement of possible informal savings forms by the expansion of the institute.

The remainder of the paper is organized as follows. Section II presents a review of the financial institutions that provide services to low-income individuals and an overview of existing literature. Section III summarizes the main characteristics of the Mexican savings institute (Pahnal) and its new savings instruments, describes its 1993 expansion, and its validity as a natural experiment. Section IV presents the data and the calculation of the saving rates. The identification strategy and the effects of financial access on the saving rates are included in section V. Section VI presents the analysis of informal savings instruments. It contains a description of available data and the effects of the expansion on these informal vehicles. Section VII presents the conclusions of the paper.

II. Microfinance Institutions and Literature Review

The assertion that low-income people do not save can be refuted. Probably this unfounded belief may be based on the fact that their savings instruments are not necessarily financial assets; instead, they could be any object that can be used to preserve value and perhaps increase it from the present to the future. Such savings instruments then could include gold coins, jewelry, cash and even animals. Rosenzweig and Wolpin (1993) describe the use of bullocks as an asset in India. In their model, bullocks are investment assets used both to generate income and to smooth consumption.⁴ Nevertheless, most of the evidence about this issue is anecdotal.⁵

It is possible that poor people's savings are low simply because it is not attractive for them to save given the lack of access to adequate formal savings instruments (i.e. non-expensive, simple to understand and reliable).⁶ Several papers document that when suitable financial instruments are accessible to low-income individuals, they are regular and eager savers. Nevertheless, it is difficult to find a quantification of this behavior.^{7 8}

A related issue is the effect of increasing the number of branches of commercial banks (especially in more convenient places) on low-income people savings. Accessible bank

⁴ In the case of rural Western Tanzania, Dercon (1998) mentions cattle as a good asset to smooth consumption. However, low-income households can not accumulate enough assets to obtain that lumpy investment. Instead, they use small livestock, such as goats and sheep, which are closer to liquid assets.

⁵ Good references about the subject are Adams (1978) and Bouman and Hospes (1994).

⁶ Several articles deal with the estimation of how saving programs affect net savings, especially in the United States in the case of Individual Retirement Accounts (IRAs) and 401(k)s. Despite the many articles that study tax incentives and savings, uncertainty remains about the effects of the policies designed to promote savings. For reference see Berheim (1996); Venti and Wise (1986 and 1990); Gale and Scholz (1995); and Poterba, Venti and Wise (1995).

⁷ For reference see Mansell (1995) and Robinson (1992).

⁸ McKinnon (1973) mentions that, in fragmented economies, money and investment are complements. Increasing the return of money raises the desirability to store it and makes it easier to accumulate capital to take opportunities of lumpy investments. Access to formal savings instrument is one of the ways in which the return of money can be increased.

offices could have an impact on the participation of these people in formal financial markets and in their savings behavior.⁹

Deaton (1990) mentions at least four reasons for studying savings in developing countries. First, at the microeconomic level, households tend to be large and poor with income prospects more uncertain than in developed countries. Second, at the macroeconomic level, few developing countries have fiscal systems that allow deliberate manipulation of personal disposable income to stabilize output and employment. Third, the postwar literature sustains that saving is too low in developing countries, and that this impedes development. Fourth, saving is even more difficult to measure in developing countries than in advanced economies.

Nevertheless, financial access and savings behavior of low-income people have been understudied. The literature has focused more on the lending side. Some studies have analyzed the effects of expanding access to credit, but little has been done on the effects of increasing access to savings instruments.¹⁰ This literature is mainly descriptive, almost without any quantification of the impact of increasing financial services.

Increasing financial access for poor people is called Microfinance. The development of this type of institutions has been an active policy for several governments. The leading or most documented microfinance institutions in the world are Grameen Bank (GB) in Bangladesh, Banco Sol (BS) in Bolivia and Bank Rakyat Indonesia (BRI). The microfinance institutions can be grouped according to their lending characteristics: lending to groups (such as GB and BS) or lending to individuals (such as BRI). It is also possible to divide them by their effort to mobilize savings (BRI mobilize voluntary savings, while GB only requires saving deposits as a lending requisite).¹¹

⁹ Ikhida (1996) finds that a 10 percent reduction in the ratio of population to the number of commercial banks branches increases 7.7 percent the private saving rate of five Sub-Saharan African countries.

¹⁰ Probably, because there are few institutions that offer this kind of services and available data is scarce.

¹¹ For a more detailed description of the microfinance institutions and a discussion of the benefits and costs of group lending see Morduch (1997).

The Bangladeshi Grameen Bank lends to groups as a mechanism to rise the repayment rate of credits without increasing monitoring costs. Most loans have a one-year maturity, with an average size just over 100 dollars. No collateral is required and the typical interest rate is 20 percent (approximately 12 percent real interest rate).

In 1997, GB had more than two million borrowers, 94 percent of them were women. During that year, GB's total lending was 30 to 40 million dollars per month. Recent repayment rates average 97 to 98 percent. GB also provides its clients with vocational training, productive inputs and encourage improvement of hygiene, health and education. GB requires subsidies to operate.

The lending impact of the Grameen Bank is well documented. Its lending activity increased household income by approximately 17 cents for every dollar lent.¹² It also increased assets held by women and it had a moderately positive impact on the education of sons (Pitt and Khandker, 1995).¹³

The Bolivian Banco Sol also lends to groups, but it differs in some important ways with GB. First, its focus is more on banking (not on social service like GB). Second, loans are made to all members of the group simultaneously and interest rates are higher in nominal and real terms. Third, the bank does not rely on subsidies. Fourth, Bolivian borrowers are richer than those in Bangladesh, and loans' amounts are larger (average loans are five times larger than those of GB). By 1994, BS had 63,000 low-income clients (about 1/3 of the clients in the entire Bolivian banking system).

The Indonesian is a very special case.¹⁴ The Bank Rakyat Indonesia (BRI) is perhaps the leading microfinance institution in the world. BRI lends exclusively to individuals, not to groups; its loans require collateral, so the very poorest borrowers are excluded, but operations remain small-scale. The initial amount that a client can borrow is small, but it

¹² However, the effectiveness of the program is not clear. For the same period, subsidies at GB were 21.5 cents for every dollar lent.

¹³ Morduch (1998) finds that GB programs are associated with lower variation in labor supply and consumption across seasons. However, he finds no evidence that the programs increase consumption levels or the educational enrollments for children exposed to them.

¹⁴ For an excellent analysis of the Indonesian experience, see Robinson (1992, 1994 and 1995).

increases with her repayment performance. In 1995, loan interest rates were 24 to 34 percent depending on payment realizations (roughly 15 to 25 percent in real terms). In the same year, BRI earned 175 million dollars in profit on their loans to low-income households.¹⁵

Since 1983, BRI has centered on achieving cost-effectiveness by setting up a network of small branches (with an average of five staff members each. The introduction of a set of deposit instruments, with different mixes of liquidity and returns appropriate for the varied demand of local markets, was an essential requirement to mobilize savings. Before these reforms, savings in-kind (gold, animals, land, grain, etc.) and in credit societies predominated in rural areas.

By December 1983, deposits in 3,600 unit banks nationwide totaled only \$17.6 million. By 1988, after the introduction of adequate savings instruments for low-income people, over 4 million poor households were saving through the program, and by December 1996, over 16 million had deposits (people mainly preferred highly liquid savings instruments). This represented over 3 billion dollars in savings and gave BRI a relatively cheap source of funds for re-lending while providing households with means to build assets and to better smooth consumption. In October 1993, the average loan was 469 dollars and the average balance on an account was 175 dollars. Of all accounts, 86 percent had balances below 242 dollars, while 46 percent were below 12 dollars; BRI was actually targeting low-income people. BRI now serves about 2 million borrowers.

The lessons from the Indonesian microfinance experience show that poor households are willing and able to save if given attractive instruments. Nevertheless, there is no explicit quantification of the effect. Evidence suggests that liquidity and safety may be more important than interest rates. It is widely believed that low-income people save for

¹⁵ Repayment rates and profits on loans to poor households exceeded the performance of their loans to corporate clients. Morduch (1997).

emergencies and unexpected investment opportunities. This could explain their preference for liquid accounts.¹⁶

III. Description of Pahnal and its 1993 Expansion¹⁷

Patronato del Ahorro Nacional, commonly known as “Pahnal”, is a Mexican government institution. It began operations in December 1949, with the objective of collecting and promoting the habit of savings, especially among low-income people. During the 70’s, Pahnal offered two savings instruments. One was a liquid bond, issued in different denominations; its maturity was 3 years. The second type of instrument was the Systematic Monthly Savings Plan. It had fixed monthly deposits and it had the same maturity as the previous instrument. This vehicle was explicitly targeted to the poor sector of the population. Both instruments paid an average nominal interest rate of 26 percent in 1986.¹⁸ At the end of the 70’s, Pahnal had 4 percent of the banking system’s total deposits in the country.

However, during the 80’s, average inflation in Mexico was 65 percent a year and Pahnal did not adjust its interest rates. Consequently, its depositors suffered substantial losses in real terms. This situation caused a substantial decline in the presence of Pahnal in the financial sector in Mexico by the beginning of the 90’s. From July 1992 to the end of that same year, deposits fell by 19 percent. In July 1993, deposits were 8 percent lower than in December 1992.

¹⁶ Other documented saving motives are to self-finance long-term investments, such as the purchase of land or children’s education; for house construction; and to finance old age and disability.

¹⁷ The Mexican case is propitious to study the savings behavior of low-income people for several reasons. First, Mexico went through a deep economic reform process after 1986. Second, there was a stable macroeconomic environment during the period of analysis. Third, at the beginning of the 90’s, there was a financial liberalization that reduced the distortions in the savings decisions (for a detailed description of households and firms savings in the country see Székely, 1996). Fourth, Mexico is richer, in Purchasing Power Parity terms (PPP) than Indonesia, Bangladesh or Bolivia. Nevertheless, Mexico’s income distribution and the percentage of people living on less than 1 dollar a day (PPP adjusted) are not better than the ones of those three countries (World Bank, 1997).

¹⁸ The average inflation in Mexico from 1970 to 1980 was 17 percent. However, during 1986, it was 79.6 percent. Interest rates of both instruments did not vary much from the rest of the 80’s to 1993.

3.1 Pahnal's expansion

During the second half of 1993 Pahnal embarked on significant reforms in two dimensions. First, there was an explicit intention to reach new areas while keeping administrative costs low. To accomplish this, Pahnal opened new branches in post offices; this model was already implemented in countries like Germany, Israel and Japan.¹⁹

To keep the administrative costs low, on average, there were only two employees in this new kind of branches. Moreover, only one simple form was required to be filled out to open an account, account statements were not mailed to depositors, and important economies of scale were realized by locating offices within the post office network.

The second part of the reform was the creation of savings instruments. It is important to remark that during the period of analysis, commercial banks only offered savings instruments that were not adequate for low-income people. In February 1994, a leading Mexican bank offered a savings account that required a minimum initial deposit and a minimum balance of 1,000 pesos (around 330 dollars on that period).^{20 21}

This type of bank account had several fees and commissions. The bank charged a 30 pesos fee just to open the account; an annual 30 pesos commission for handling it; a 2 pesos fee for each withdrawal and for each balance inquiry; and a 50 pesos penalty if the monthly balance was lower than 1,000 pesos. This account paid an interest rate of 6.4 percent (negative in real terms). Furthermore, banks required complicated paperwork and

¹⁹ Section 3.2 presents detailed information about the number of offices opened and their location.

²⁰ Before the 1990 Mexican financial liberalization, banks used to offer savings instruments that required low minimum balances and low fees and commissions. Banks were able to cross-subsidize among high and low balances accounts; the existent financial repression in Mexico made that possible. However, after the financial liberalization, banks were forced to offer more competitive interest rates and the cross subsidies disappear. Banks then started to increase the requirements for savings accounts. For a more detailed description see Mansell (1995).

²¹ It is safe to assume that most Mexican banks had similar requirements for their savings accounts. Two reasons can be given: first, the oligopolistic nature of the Mexican banking system and the high costs of handling a big number of small accounts.

a small proportion of their branches were located in poor or rural areas. Consequently, access to formal financial instruments was highly limited for low-income people.

Pahnal changed the savings opportunities of low-income people. It offered two new, simple and easy-to-understand financial instruments. The first one is a fixed term instrument called Tandahorro. It has compulsory monthly deposits of at least 50 pesos (a little more than five dollars at the end of November 1999). Its balances may not be withdrawn until maturity. There are three maturity terms: 12, 24 and 36 months.

Tandahorro's interest rates are a proportion of the returns paid by government bonds (roughly 60 to 70 percent). In 1994, the average rate paid by this instrument was 12.5 percent net of taxes, while the average inflation in the same year was 7.1 percent. If the interest rate is less than inflation, under some conditions, the saver receives a cash payment as compensation.²² There are no fees or commissions and there is automatic renewal if principal is not withdrawn at maturity.

The second instrument is called Cuentahorro. The minimum balance in this instrument is 50 pesos.²³ It has immediate withdrawal privileges, and there are no commissions or fees. This instrument offers interest rates approximately 5 percent lower than Tandahorro.²⁴ There is no compensation for losses caused by inflation.

Pahnal offers monthly lotteries to its account holders. For every 250 pesos in her account, the depositor gets one ticket to participate in a lottery. This is a monthly lottery with 300,000 pesos in prizes, which are deposited directly into the winners' accounts.²⁵

²² Savers receive this compensation provided that they have complied with all monthly deposits, made by the established dates, and a minimum balance of 1,800 pesos.

²³ For both instruments, the required minimum initial deposit is 50 pesos.

²⁴ For example, in July 1998, Tandahorro's interest rate was 10.4 percent, while Cuentahorro's was 9.8 percent.

²⁵ Pahnal has additional programs. It has a savings instrument for children. Its interest rate is 50 percent of the government bonds rate. Along with the opening of the account, Pahnal gives the child a collectible stamps-album. This instrument also has a lottery with in-kind prizes. It also has a pilot program in a Mexican city. Retired government officials of the city are able to cash their pension checks at Pahnal's offices. These retirees, numbering about 4,000, are encouraged to open accounts. The results of the program are promising. Up till now, 32 percent of them have opened an account.

Pahnal is expanding in the rural areas of Mexico. In December 1997, it opened 100 offices in rural areas of 8 states. The program is ambitious; Pahnal wants to expand its rural network to 400 branches by the end of the year 2000.

In April 1998, 61 percent of Pahnal's savers were women. The average age of account holders was 36.1 years. Housewives represented 33 percent of Pahnal's account holders. Small traders, carpenters, plumbers, mechanics, craftspeople, retirees, employees of the informal sector, and maids represented 54.5 percent of Pahnal's clients.

Table 1 presents some of the results of the Pahnal's reform at the end of 1994.²⁶ As shown, the importance of the old instruments had diminished considerably.²⁷ In July 1993, these vehicles represented 47 percent of total balances, while by December 1994 they accounted for only 26 percent of the total deposits in the system. During the same period, there was an increase of more than 43 million dollars in total deposits.

Total deposits increased from 154.9 million pesos in July 1993 to 970.6 million pesos in June 1998. From June 1994 to June 1998, the annual growth rate of total nominal deposits in pesos was 45 percent; which represented an annual real growth rate of 28 percent.

The most popular instrument is Cuentahorro, the short-term instrument. At the end of 1994, it represented more than 74 percent of the accounts. This reflects depositors' preference for liquidity.²⁸ From July 1993 to December 1994, the number of accounts increased 174 percent (from 83,300 to 228,500). As of June 1998, the total number of accounts was 560,800.

²⁶ Table 1 contains information up to December 1994 for two reasons. First, it avoids the effects of the end of year peso devaluation on the dollar value of deposits, and second, that is the period of analysis in the following sections.

²⁷ Old instruments refer to pre-reform instruments that include bonds and the Systematic Monthly Savings.

²⁸ In 1998, Cuentahorro remained the most preferred instrument, representing 72 percent of the total number of accounts in Pahnal. Also, in a survey done by Pahnal in April 1998, 51.2 percent of its customers responded that they preferred liquidity over return. The same type of behavior was also found in the Indonesian experience.

At the end of 1994, the average balance in a Pahnal account (including only Cuentahorro and Tandahorro) was 1,057 pesos.²⁹ Cuentahorro's average balance was lower than Tandahorro's, reflecting the more extensive use of the liquid account by relatively poorer individuals. In June 1998, the average account balance was 1,678 pesos. In the same month, 48 percent of accounts had balances lower than 500 pesos (the average exchange rate during that month was 8.95 pesos per dollar).

Pahnal's average account balances are similar to those of other microfinance institutions in the world. According to data from Sustainable Banking with the Poor of the World Bank, the average deposit of microfinance institutions (in several regions of the world including East Asia and the Pacific, Africa and Latin America) was 367 dollars in 1996. The median deposit was 121 dollars in the same year. However, in East Asia and the Pacific, the average deposit was only 219 dollars and the median was 54 dollars.

Pahnal has two sources of financing its administrative expenditures. The first one is the interest rates spread between the return of government debt instruments and the return paid to its account holders (all Pahnal's deposits are invested in government debt instruments). The second source comes from government subsidies.³⁰

It is important to remark that, since 1990, the financial landscape in Mexico has changed substantially.³¹ Furthermore, since 1996, these changes have been considerable in the case of financial instruments for low-income people. During the second half of that year, several commercial banks began to offer savings instruments for low-income people.

²⁹ Around 313 dollars valued at the average exchange rate of 1994. In the same year, Mexican GDP per capita was 4,835 dollars.

³⁰ According to estimates of Pahnal's officials, Pahnal is not far from being sustainable without subsidies. The institute would be capable of operating without subsidies with total deposits of 1,172 million pesos (as noted before, in June 1998, Pahnal had 970.6 million pesos and the rate of growth in total deposits is substantial). However, this calculation does not include the implicit subsidy from opening and operating branches using the infrastructure of the postal service.

³¹ For a description of the financial landscape in Mexico consult Mansell (1995).

According to bankers, they didn't service low-income people due to lack of infrastructure to handle a big number of accounts with small balances.³²

In July 1998, twelve commercial banks had some type of low-income saver account. However, the minimum balance to open an account was in general higher than the one required by Pahnal (only two banks offered instruments with initial deposit lower than 50 pesos). Also, the interest rates paid by these instruments were lower than those of the savings institute. These new commercial banks' instruments usually have access to automatic teller machines (in some cases the client has to pay a fee every time she uses this service). As Pahnal, some of these banks have established lotteries. However, the minimum balance to participate in the lottery has been always higher than the one of the institute.

3.2 Validity of the Expansion as a Natural Experiment

During the second half of 1993, Pahnal began an expansion of its number of branches. In 1992, it had 96 offices in 67 towns. By December 1993, the total number of new offices was 98 in a total of 34 towns. Almost 95 percent of the opened offices used the infrastructure of the postal services. Table 2 shows this expansion on a timeline.

³² At least four commercial banks initiated a low-income savings program during the second half of 1996 (El Economista, 1996).

The expansion was carried out only in 8 of the 31 Mexican states.³³ Mexico City was included in the expansion; approximately 60 percent of the new offices were opened in that city.³⁴ The expansion was mainly done in towns that did not have an institute office before 1993. Pahnal's expansion covered 27 new towns.

The expansion continued; by June 1998, Pahnal had 391 offices and covered all Mexican states (100 offices were located in rural areas). The number of offices is projected to rise, more rural areas will be covered.³⁵

Pahnal's expansion can be used as a natural experiment to study the effect of increasing financial access on savings behavior of low-income people. It is possible to compare the saving rate of households affected by expansion versus those that were not affected, before and after the extension of the system occurred.

For the results to be valid, the expansion should not be related to the households' savings preferences. It should be clear that a demand driven model did not influence the selection of cities or towns. About this issue several points can be addressed. First, a way to test the validity of the Pahnal's expansion as a natural experiment is by performing a reverse experiment. This analysis was done using the 1989 and 1992 Household's Income and Expenditures surveys. The same types of regressions, as those described in section V, were performed.

According to this exercise, households located in towns that were going to be selected for a Pahnal office expansion, but in 1992, did not show a significant differences in their saving rate, when compared to households located in the same towns in 1989. Most of the coefficients of the difference in difference estimators were non-significant and with the

³³ These states are Chiapas, Jalisco, Mexico State, Nuevo León, Puebla, Oaxaca, Veracruz, and Zacatecas.

³⁴ Mexico City is also a federal district.

³⁵ When compared with private banks in Mexico, Pahnal does not look as a small financial intermediary. In June 1998, there were 37 private banks in the country. Pahnal was the 5th place in number of branches. It was the 4th place in number of savings accounts. When all types of private banks' accounts (checking, savings and long term deposits) are considered, Pahnal was the 8th place. It was the 11th place in number of employees (Mexican Banking Commission, September 1998).

wrong sign.³⁶ There is no evidence of significant differences in the saving rates of affected and non-affected towns in the 1989-1992 period, which validates the exogeneity of Pahnal's expansion in 1993.

Other important aspect for the validity of the experiment is to check if there were important differences in the characteristics of the affected and non-affected towns before the expansion. One of these main characteristics is the 1992 average saving rate among selected and non-selected towns. Using the saving rate in which consumption definition includes housing expenditures, the equality of the average saving rate of affected towns in 1992 and the one of households living in non-affected towns in the same year is statistically rejected. Nevertheless, using the saving rate in which consumption definition does not include housing expenditures, it is not possible to reject the null hypothesis of means equality.

A probable explanation to this finding is that the proportion of homeowners in non-affected towns was bigger than the one in affected towns. Due to the nature of the calculation of the saving rate with consumption including housing expenditures, the higher proportion of homeowners in non-affected towns is driving the difference in households' saving rates means among expansion and non-expansion towns in 1992.³⁷

At an aggregated level, a validity test of the experiment is to check if the expansion was correlated to the saving rates of the states.³⁸ The expansion is not closely related to the average saving rate in the states. There are low saver states that were part of the expansion, such as Puebla. There are middle savers too, such as Mexico City, the State of Mexico, and Veracruz. There are high savers such as Zacatecas, Jalisco, and Nuevo León. Different correlation coefficients between the households' saving rates living in different states in 1992 and Pahnal's expansion were small and never significant.

³⁶ The estimates are shown in appendix 2 at the end of the paper.

³⁷ Doing separate analyses for homeowners and non-homeowners do not change the general trends of the paper's results. These estimates are included in appendix 1 at the end of the paper.

³⁸ For the method of calculation the saving rates see section IV.

It is possible to argue that, households' savings preferences are correlated with the aggregate income level in the states. If the expansion had been carried out only in high or low-income states, this would have been a problem for the validity of the experiment. Nevertheless, there is no clear correlation between the opening of an office and the income level in the state. Nuevo León is a high-income state, Zacatecas is a middle-income and Chiapas and Oaxaca are the last two on the income scale. Furthermore, different correlation coefficients between 1992 average income in the states and the expansion of Pahnal were never significant. The expansion was not concentrated in states with a specific level of income.

The expansion was carried out not solely in areas where Pahnal had a long-standing presence. There are metropolitan areas with long standing presence, such as Guadalajara City in Jalisco and Mexico City. This reflects convenience and prompt response to any operational issue or problem in the new offices. According to conversations with Pahnal's officials, they chose places in which they could supervise closely the operation of the new offices. Nevertheless, they also chose to expand in some states in which its presence was limited: Zacatecas, Chiapas, Oaxaca, and Nuevo León.

Finally, it is important to mention that none of the documents describing the Pahnal's expansion (official or unofficial) have any reference of a specific selection method for location of the new branches.

IV. Data Description and Saving Rates Calculation

The data consists of 1992 and 1994 Mexican Household's Income and Expenditures surveys (Encuesta Nacional Ingreso Gasto de los Hogares). They are representative at the national level and strictly comparable. Both surveys used the same data collection techniques.³⁹ The 1992 survey includes observations of 10,530 households; the 1994

³⁹ For a detailed description of the survey characteristics, see Inegi (1994).

survey has 12,815 households. The surveys have detailed information on after tax income, expenditures, financial transactions as well as job and demographic characteristics.

Two simple measures of flow saving were constructed. In one, consumption definition includes housing expenditures while the other does not.⁴⁰ The reason is that the construction of the imputed house rent variable was not clearly explained and it was difficult to make sense of some of the estimates. Also, a considerable proportion of the values for this variable was missing from the surveys. Any partial adjustment on this type of expenditure would be arbitrary; therefore it was decided to have two alternative definitions of saving rates. Also, this has the convenience that using two different measures of saving rates represents a robustness test of the results.

Table 3 shows means and standard errors of relevant variables. Statistics are calculated dividing the sample into expansion and non-expansion towns before and after the Pahnal's reform. As can be seen, saving rates are higher in non-expansion than in expansion towns, both in 1992 and 1994 and independently of the saving rate definition used. This difference is attributed to the ratio of homeowners to non-homeowners in control and treatment towns (homeowners save on average more than non-homeowners do); this ratio is higher in non-expansion towns. Nevertheless, as the appendix 1 of the paper shows, splitting the sample between homeowners and non-homeowners to do the analysis does not change the main results.

In the case of non-expansion towns, saving rates show a decrease from 1992 to 1994. The reduction is significant for saving rates that include housing expenditures. The main

⁴⁰ Saving rates are defined as household income minus household consumption divided by household income. Household income is defined as the sum of wage income, business income, rent income, income from transfers and other income. Household consumption is the sum of food expenditures, communications and transport expenditures, personal expenditures, health expenditures, educational expenditures, appliances expenditures, clothing expenditures, travel and leisure expenditures, housing expenditures and other expenditures. The difference among the two saving rates is that one includes housing expenditures in the calculation of household consumption, while this type of expenses is not included in the alternative definition.

reason is that housing rents, on average, increased 7.4 percent on real terms from 1992 to 1994.⁴¹

On the other hand, saving rates of expansion towns increased from 1992 to 1994. The increment was 59 percent in the case of the saving rate for which consumption includes housing expenditures and 22 percent for the other definition of saving rates.

The saving rate distribution in the sample is not symmetrical, despite the definition used. This holds for saving distributions generated with different combinations of years, expansion or non-expansion towns and income per member levels. Different normality tests for these distributions were rejected.

In the case of income, the mean of this variable is smaller for households living in non-expansion towns. The reason is that expansion was concentrated in bigger towns and cities. Average income is highly correlated with the size of the city; rural areas tend to be poorer. However, this difference in income between non-expansion and expansion groups is not driving the results. A similar analysis to the one done in section V, but using income as a dependent variable, showed that the effect of the expansion in this variable was not significant.⁴²

In the case of the other relevant variables, there were small differences between expansion and non-expansion towns before and after the reform of the system took place. Nevertheless, education was higher and the number of kids was smaller among expansion towns reflecting the urban predominance of the expansion.

Table 4 exhibits the relation between saving rates and income. It shows that average saving rates, for the entire sample, increase with the level of household income. As can

⁴¹ Also, the group that had income per member of the household of two to five minimum wages reduced their saving rate in 1994, independently of the definition used. One reason could be the effects of the financial liberalization. Households with that income level were likely to receive an expansion in credit to buy durables (for example automobiles).

⁴² As a robustness test, the analysis of the saving rates was also done without including Mexico City. The main results hold.

be seen, households with incomes up to the minimum wage have, on average, a negative saving rate equal to -5.8 percent if housing expenditures are included in the calculation of the saving rate. When they are not included, the saving rate is 3.2 percent. The most well off people in the sample save between 27 and 34 percent of their income, depending on the saving rate definition used.

Table 5 presents the saving rates before and after the expansion only for affected towns. From 1992 to 1994, the average saving rate in these towns increased between 22 percent to 59 percent, depending on the saving rate definition used. Average income also increased in the same period, but only by 1.5 percent. As will be clear from the regressions' results, this incremental income is not sufficient to explain the rise in the saving rate.

V. Identification Strategy and Results of the Effects of Financial Access on the Saving Rates

5.1 Identification Strategy

As stated in the introduction, the goal of this paper is to compare the savings of households with access to formal instruments to those without it and try to identify whether there is an effect on the saving rate or on other forms of savings caused by the availability of formal financial vehicles. The fundamental empirical difficulty with this kind of estimation is how to handle savings heterogeneity among households.⁴³

The expansion of Pahnal, described in the section III, helps to solve this problem; it can be used as a natural experiment. It allows the construction of experimental and control groups as follows: households located in towns or cities in which Pahnal opened an office

⁴³ The problem is that households' preferences for savings should be correlated with the use of formal financial instruments and, in general, with the access to this kind of instruments. Therefore, a simple OLS regression with a dummy indicating possession or access of the formal saving instrument by the household will be biased by unobservables. This problem is described extensively in the literature. For reference see Bernheim (1996).

in 1993 form the experimental group. Residents of non-affected towns or cities form the control group. Comparison between these two groups will show the effect of increasing financial access on saving rates, especially for low-income people.

The basic equation to estimate is the following:

$$\begin{aligned}
 S_i = & \mathbf{d}_0 \text{ Dummy } 1994_i \text{ } \wedge \text{ New Town Expansion}_i \\
 & + \mathbf{d}_1 \text{ Dummy } 1994_i \text{ } \wedge \text{ Expansion}_i + \mathbf{d}_2 \text{ Dummy } 1994_i \\
 & + \mathbf{d}_3 \text{ New Town Expansion}_i + \mathbf{d}_4 \text{ Expansion}_i + X_i \mathbf{b} + \mathbf{e}_i
 \end{aligned} \tag{1}$$

The dependent variable S_i is the saving rate for household i or the amount of different saving components.⁴⁴ Two alternative definitions of saving rates are used in the estimation procedures. In the first one, expenditures include housing expenses; while in the second, this type of expense is not included.

The first exogenous variable in equation (1) ($\text{Dummy } 1994_i \text{ } \wedge \text{ New Town Expansion}_i$) is the interaction between two dummy variables. The first equals one if the year is 1994. The second is a variable equal to one if the expansion was in a town or city where the new Pahnal office was the only office of the system in town. The next independent variable ($\text{Dummy } 1994_i \text{ } \wedge \text{ Expansion}_i$) is the interaction between 1994 and the expansion of the system, but in a town that already had a Pahnal office in 1993.

The explicit differentiation between these two types of expansion (new town expansion and town with a pre-expansion office) is useful to identify different effects of the system reform. It is possible to assume that access will not be a big problem for households if the new office is located in a town that already had a Pahnal office. However, the issue is not so simple.

⁴⁴ As mentioned, one important aspect of increasing financial access is the possible displacement of informal forms of savings.

It maybe the case that a single branch in the location was not enough; one of the reasons could be that the old office was not conveniently located.⁴⁵ Also, advertising and promotion of the institute could be more effective in postal offices, which are known by most of the people.⁴⁶ Therefore, it is important to control for both kinds of expansions.⁴⁷

Equation (1) also has a dummy for 1994 observations (*Dummy 1994_i*); a dummy for households that are located in towns in which the new office was the only office (*New Town Expansion_i*); and a dummy for households living in towns in which the new office was not the only office (*Expansion_i*).

The rest of the exogenous variables (represented by X_i) are income per member of the household, household head gender, education indicator variable and its square, occupation of household head, a dummy for irregular reception of income,⁴⁸ a dummy for employment stability,⁴⁹ a dummy for access to medical services, the number of income recipients in the household, the children in the household (as a percentage of total number of members), the interaction of the percentage of children with the availability of medical services, and state dummies.

The second type of equation includes income per member level dummies and their interaction with the expansion of the system. This exercise deals with one of the central expected implications of the expansion: the increase in financial access should be beneficial mostly for low-income people. Theoretically, the program should have higher effects on the poorest than on the wealthiest households. Given the type of instruments

⁴⁵ Mansell (1995) explains that sometimes even when the local bank is not far away in miles from a community, it is far away in terms of travel time. Mainly road conditions and available public transportation cause this. She documents this issue.

⁴⁶ Robinson (1992) explains that much of the success of Bank Rakyat Indonesia was its use of former “rice banks units”. During the 70’s, producers got subsidized rice seed through these rice banks. When this program failed, its offices were used to open BRI units. Advertising of BRI was not highly necessary, given that most people knew these offices.

⁴⁷ Another case could be considered: towns with Pahnal offices that did not have an expansion in 1993, but started offering the new instruments. As a robustness test, the analysis was also done including this third case. Results did not change significantly. Towns with offices but no expansion of their number showed smaller, and sometimes significant, coefficients.

⁴⁸ Income reception is considered irregular if it is received in time spans greater than 3 months.

⁴⁹ Variable equals one if the worker is in a union and has a formal job contract.

offered by Pahnal and the implicit assumption that richer households already have access to formal financial institutions, their behavioral response should be smaller than the one of the poorest individuals.

This estimation is of the following form:

$$\begin{aligned}
S_i = & \sum_{j=1}^4 \mathbf{d}_{1j} \times \text{IncomeLevelDummy}_{ji} + \\
& \sum_{j=1}^4 \mathbf{d}_{2j} \times \text{IncomeLevelDummy}_{ji} \times \text{Dummy1994}_i \times \text{NewTownExpansion}_i + \\
& \sum_{j=1}^4 \mathbf{d}_{3j} \times \text{IncomeLevelDummy}_{ji} \times \text{Dummy1994}_i \times \text{Expansion}_i \\
& + \mathbf{d}_4 \text{Dummy1994}_i + \mathbf{d}_5 \text{NewTownExpansion}_i + \mathbf{d}_6 \text{Expansion}_i + X_i \mathbf{b} + \mathbf{e}_i \quad (2)
\end{aligned}$$

In this specification, S_i denotes saving rate of household i . Subscript j represents different income per member brackets. There are four brackets of income per household member: up to the minimum wage, between one and two times the minimum wage, between two and five times the minimum wage and between five and ten times the minimum wage.⁵⁰ Income per member level dummies, a 1994 dummy, Pahnal's expansion dummies (in its two forms), and interaction of these variables are included. The continuous variable income per member and the interaction variables of the 1994 dummy and the Pahnal expansion (in both of its forms) are not included. The rest of the specification is similar to that of equation (1).⁵¹

There are two concerns with the estimation of this problem. The first one is the presence of outliers in the data. The second one is the non-normality of the saving distribution. In

⁵⁰ The minimum wage was around 100 dollars at the period of analysis.

⁵¹ As a robustness test of the estimates, an extension of equation (2) was realized. In that exercise, the interactions of the 1994 dummy and the income per member dummies were included as additional regressors. Results are similar to those found using specification (2).

order to address these issues, two estimation techniques were used. The first one is a robust regression method, which deals with the presence of gross outliers in the data.⁵²

Given the rejection of normality tests of the saving rate distribution, it is not clear that the center of analysis should be the mean of it (which tends to be driven by the upper tail). Therefore, the second method of estimation is the median regression. This method deals directly with this problem. This type of estimation describes the behavior at the center of the population distribution, thus evading the sensitivity to extreme values. In this paper, in order to avoid any assumption about the distribution of the standard errors, the median regressions are done with bootstrapped standard errors (with 100 iterations).⁵³

5.2 Results of the Effects of Financial Access on the Saving Rates

5.2.1 Basic Analysis

The basic question of this paper is whether increasing financial access has an effect on the saving rate of affected households, especially on low-income households. Equation (1) deals directly with this issue. Saving rates of households located in towns affected by the expansion in 1994 (either with or without a pre-expansion Pahnal office) should reflect the effect of increased access. This specification shows the average effect of the expansion, regardless specific levels of households' income.

Table 6 presents the results for the saving rate with housing expenditures. The first two columns show the robust regression estimates, including and not including covariates. As shown in the table, opening an office in a new town increased the saving rate of affected households by 4.7 to 6.7 percentage points. These estimates are significant at the 5

⁵² The robust regression method estimates an ordinary least squares regression and performs a Cook's outliers test. After eliminating gross outliers, the method performs the regression again, it calculates weights based on absolute residuals, and regress again using those weights. The process iterates until the change in weights drops below a tolerance level. OLS estimates were also calculated. In general, OLS results were stronger than robust regression results.

⁵³ For both types of methods the data set was cleaned before estimation. Saving rates were constrained to be in the -100 percent to 100 percent interval. Estimates using the complete data set were calculated. Results did not change significantly.

percent and at the 1 percent level, respectively. The expansion in a town that had a Pahnal office before 1993 caused a 3.9 to 4.2 percentage points increase in the saving rate. The degree of significance of these coefficients is higher in this case. The equality of the coefficients for the two types of expansion can not be statistically rejected.

In the case of the median regression, the median saving rate is 5.0 to 6.7 percentage points higher for households located in towns in which the new Pahnal office was the only office in 1994. These estimates are significant at the 5 percent and at the 1 percent level, respectively. The expansion of the system in a town that already had an office has a positive effect of around 4.0 percentage points on the saving rate and it is significant at the 1 percent level in the estimation without covariates (the significance is 5 percent when adding covariates).

For both types of estimation methods, income per member has a significant but small effect on the saving rate of the households. Other interesting results are that the saving rate increases by more than 5.9 percentage points when a man is the head of the household than when the head is a woman. Also, the saving rate is higher when the number of income recipients in the household increases (by approximately 4 percentage points) or if the head of the household is an employer. Households tend to save more when their income stream is irregular; in this case, their saving rate is on average 5 percentage points higher.

Table 7 presents the basic estimation results for the alternative definition of savings: the saving rate without housing expenditures.⁵⁴ Robust regression estimates, including and not including covariates, show that households located in towns in which the new Pahnal office was the only office had a saving rate that is on average 4.2 to 5.7 percentage points higher than unaffected households. These estimates are significant at the 10 percent and the 5 level, respectively.

⁵⁴ The significance of the 1994 dummy is reduced when this dependent variable is used. The probable reason is that this definition of saving rate does not include the value of rents that increased 7.4 percent in real terms from 1992 to 1994.

According to the robust regression results, if the household is located in a town in which the new office was not the only one, the effect of the expansion on its saving rate is smaller, around 3.1 to 3.3 percentage points. These coefficients are significant at the 5 percent level.

Using the median regression technique, the impact of the expansion in a new town is 7 percentage points and it is highly significant in the no covariates case. Nevertheless, when adding covariates, the effect of this type of expansion is reduced to 3.2 percentage points and is no longer significant (the t-statistic is 1.286). In the case of an expansion in a town that had a pre-expansion Pahnal office, its effect on the saving rate is 1.8 to 3.4 percentage points. The estimate that does not include covariates is significant at the 5 percent level. Nevertheless, the other case is not significant.

The saving rate without housing expenditures is higher if the head of the household is a man; the effect is around 2.7 percentage points. The same is true if the number of income recipients increases (this has an impact of approximately 3.0 percentage points for every working member) or if the head of the household is an employer (the saving rate in this case is between 6.5 and 7.4 percentage points higher). Irregular reception of income also increases the household saving rate.

5.2.2 Analysis by Levels of Income per Household Member⁵⁵

From the previous section it can be concluded that, in general, the expansion of Pahnal had a positive effect on the saving rates of affected households. But the average effect of this policy should mask large variations in the responses of households' saving rates according to different household characteristics, such as income. There are reasons to believe that households with different levels of income responded differently to the program since Pahnal explicitly targeted its instruments to low-income individuals.

⁵⁵ In this section, income always represents income per member of the household.

Equation (2) deals with this issue. The interaction of the level of income per member of the household and Pahnal's expansion gives the effect of increasing access to specific income groups of the population.

Table 8 presents the results when the dependent variable is the saving rate with housing expenditures. In the robust regression estimates, Pahnal's expansion in a new town increases the saving rate of the poorest households by 8 to 9 percentage points.⁵⁶ These estimates are significant at the 1 percent level.

For higher levels of income, the results are different. For the income bracket of one to two times the minimum wage, the effect is significant for the estimate without covariates; however is non-significant in the estimate with covariates. For the two to five times the minimum wage income bracket, the program increases the saving rate by 8.8 to 9.6 percentage points and it is not significant in the estimation without covariates and significant in the other case. In the five to ten times the minimum wage income bracket category, the saving rate is reduced by 12.8 to 14.5 percentage points and these estimates are significant at the 10 percent level.⁵⁷

In expansions in a town that already had an office, the policy increases the saving rate of households with income per member up to the minimum wage by 6.3 to 7 percentage points. These estimates are significant at the 1 percent level. For the rest of the income brackets, the expansion has no statistical effect on the saving rate; the coefficients are all non-significant.

In the case of the median regression estimates without covariates, the expansion in a town that did not have a Pahnal office before 1993 increases the saving rate of affected households by around 7 percentage points for households with income per member up to two minimum wages. The effect of the expansion is smaller in towns that had a pre-

⁵⁶ These are households with income per member of up to the minimum wage.

⁵⁷ It is important to mention that the omitted income category is the richest population. Also, the results for the five to ten minimum wage income per member bracket are not robust to different estimation techniques and not even to different measures of saving rates.

expansion office, however the equality of coefficients between both types of expansion cannot be statistically rejected.

In the estimation with covariates, the only interaction coefficient that is still significant is the one for the lowest income population, no matter the kind of expansion. The effect for both types of expansion is similar: around 8 percentage points increase in the saving rate of poorest households. All other interactions are not significant. This result supports the prior that only the poorest individuals should be affected by the increase in financial access.

The behavior of the rest of the exogenous variables is similar in the income level estimation (regardless of the estimation technique used). The saving rate of the household is higher if the household head is a man, if the head is an employer, if the number of income recipients increases, or if the reception of income is irregular.

Table 9 presents the results for the saving rate without housing expenditures. The expansion of the system to a new town increases the saving rate of the households with income per member up to the minimum wage by 6.8 to 7.8 percentage points. These effects are significant at the 5 percent and 1 percent level, respectively. The expansion of the system also rises the saving rate for those in the two to five times the minimum wage income bracket by 8.1 to 9 percentage points. The effect is non-significant for the case without covariates and significant at the 10 percent level in the estimation with covariates. None of the other income brackets interactions show a significant effect.

For this saving rate definition, robust regression estimates of the impact of an expansion in a town that had an office before the expansion are, in general, non-significant and negative for the higher income brackets, in the case with covariates. Nevertheless, once again, the expansion only had a positive effect on the saving rate of the poorest households; the effect is around 5.5 percentage points increase and is significant at the 1 percent level.

In the case of the median regression, Pahnal's expansion has, in general, no significant effect on the median saving rate without housing expenditures. Once again, the expansion to a new town only had significant effects on the saving rate of the poorest households in the sample (in the estimates without covariates, the expansion also has a significant effect in the 1 to two minimum wages bracket). The saving rate of the households with income per member up to the minimum wage increases by 6.2 to 6.8 percentage points and these estimates were significant at the 10 percent and at the 1 percent level, respectively.

For the expansion in a town that had a Pahnal's office before 1993, the households' median saving rate, with income per member up to the minimum wage, is 4.1 to 6.5 percentage points higher if they were located in towns affected by the expansion. These coefficients are significant at the 10 percent and at the 1 percent level, respectively. In this case, for both estimation techniques, the rest of the exogenous variables have similar effects to those described for the other specifications.

Consistently, the program had a positive impact on the low-income households saving rate. The effect is on the order of 3 to 8 percentage points for the estimates that include all exogenous variables.

5.2.3 Estimated Magnitude of Pahnal's Exposure

The effects described in the last two sections are caused by the household's exposure to Pahnal's expansion. Therefore, the problem of self-selection into the program is avoided: the paper does not consider account holders versus non-account holders. However, this creates a concern about the size or magnitude of this exposure. If the exposure is small, the results are questionable. To tackle this matter, estimates of the amount of savings collected by Pahnal, as a proportion of total savings and low-income savings in specific Mexican cities, were constructed.

Using the surveys information it is possible to calculate the total amount of savings in these cities. These estimates use surveys' weights. These weights are the inverse of the

total number of households that each surveyed household represents in the whole city population. So, with this information, it is possible to extrapolate the savings of a city for a specific year.⁵⁸

In 1994, according to the estimates, in a typical medium size city, Pahnal's gross deposits were insignificant as a proportion of total savings in the city.⁵⁹ However, the institute's gross deposits were a substantial fraction of low-income people savings in the city. The estimates for average cities ranged from 21 percent to 29 percent of low-income people savings. When considering the net change of savings deposits in Pahnal, from December 1993 to December 1994, the amount of net deposits in Pahnal represented 10 percent to 14 percent of low-income people savings. The proportion is not constant among cities; it decreases with the size of the city. It can be concluded that exposure is significant for the relevant segment of the population, as reflected by these estimates.

VI. Crowding Out of Informal Savings Instruments

The 1992 and 1994 Mexican Households Surveys of Income and Expenditures have information about possible informal saving instruments. Surveys have expenditures and earnings received from these instruments. Some of them are categorized as financial transactions and some as income concepts. Unfortunately, the surveys are not as detailed to clearly identify informal instruments, some of them are mixed with the formal ones.

There are, basically, 6 sets of categories in the surveys that include possible informal saving instruments: (1) Expenditures (income) in (from) Rotating Savings and Credit Associations (ROSCAS), Savings Unions, Savings Accounts, Stocks, and bonds;^{60 61} (2)

⁵⁸ Estimates assume that quarterly savings are stable through the whole year. It is important to mention that, usually in the fourth quarter of the year households' expenditures tend to increase. The estimates are calculated using the two definitions of the saving rates.

⁵⁹ Medium size cities with population ranging from five hundred thousand to two million inhabitants (cities like Veracruz, Xalapa and Puebla). Gross deposits refer to the total amount of deposits at Pahnal in a specific city at the end of 1994.

⁶⁰ ROSCAS are usually formed by a small group of people. All of them contribute a fixed amount of money. They contribute the same number of periods as the number of individuals in the group. Every

expenditures (income) in (from) loans to non-family members and also interest income from these loans;⁶² (3) expenditures (income) in (from) foreign currencies, jewelry, and gold and other precious metals; (4) expenditures (income) in (from) land and houses;⁶³ (5) expenditures (income) in (from) machinery, equipment and animals; and (6) income from selling used appliances and from selling used cars.⁶⁴

6.1 Data Description of Informal Savings Instruments

Descriptive statistics of informal savings instruments are presented in two tables. Table 10 includes mean expenditures in possible informal savings instruments. These expenditures represent savings flows into these informal instruments. Table 11 presents net flows into informal these vehicles. Net flows are defined as the difference of expenditure minus income. They represent net flow savings into these instruments. Both tables show mean flows as percentage points of households' total income.

Several points about the data on informal instruments should be addressed. First, not many households were reporting expenditures (income) in (from) these type of instruments. In both surveys, on average 5.6 percent of households reported a transaction on these vehicles. The most common transaction was the one of ROSCAS, savings unions, savings accounts, stocks, and bonds with 4,949 observations for the whole sample. The second most popular instrument was loans to non-family members with 699 observations.

period, one person gets all the contributions from the rest of the ROSCAS' members. Savings associations or savings unions are usually not regulated by the Government. For reference on ROSCAS and savings associations see Bouman and Hospes (1994).

⁶¹ In this concept, informal and formal savings instruments are mixed together. The reason is that the 1992 survey asks about expenditures (income) in (from) all these instruments in a single question. However, in the 1994 survey, the proportion of households reporting expenditures or income from stocks and bonds is very small.

⁶² Interests from loans to non-family members are not considered jointly with the amount of expenditures (income) in (from) these loans because the surveys only ask about interest income but not about interest payments. These concepts are treated separately in the estimation procedures.

⁶³ These informal instruments are probably not very compelling given their low liquidity; however they have been documented in the literature as probable informal savings options. See Mansell (1995), Bouman and Hospes (1994).

Also, in terms of percentage points of income, the mean expenditures (income) in (from) informal instruments are relatively small, especially when taking into account all households in the sample. Nevertheless, considering only households that reported an informal instrument transaction, the mean expenditures (income) could be substantial. For this group of households, mean expenditures in the case of ROSCAS, savings unions, savings accounts, stocks, and bonds represented 16.2 percent of their income. For the same group, average net flows into this category were around 8.0 percent of their income.

Finally, in general, households had small but positive average net flows into informal financial instruments. In four of the five informal net flows instruments categories, households were net savers. However, in the case of loans to a non-family member, households were on average net borrowers.

6.2 Econometric Analysis and Results of Informal Savings Instruments

The objective is to look at the effect of Pahnal's expansion on the probability of finding people using informal savings instruments. This is similar to ask if people reduced or increased their expenditures in these vehicles after the system's reform (a crowding out of these instruments would be an implication of conventional savings models). The estimation of probits is adequate to explore this question.

The set of regressions to analyze crowding out of expenditures in informal savings instruments uses the specification of equations (1) and (2) of the paper. The same exogenous variables were included, only the endogenous variables and the econometric techniques used are different.

Table 12 presents the results. As can be seen, few coefficients are significant. In particular, in the case of land and houses, the expansion in a new town changes the probability of finding expenditures in these instruments by -0.01 and it is significant at the 5 percent level. For expansions in towns that had an office before 1993, there are only

⁶⁴ Unfortunately, the surveys do not make explicit difference between these two items.

four significant coefficients. At the 10 percent level: (1) in the case of loans to non-family members, expenditures of households with income per member up to 1 minimum wage, the change in the probability is 0.02. (2) For land and houses, expenditures of households with income per member up to 1 minimum wage, the interaction coefficient is 0.10. (3) Also for land and houses, expenditures of households with income per member of 2 to 5 minimum wages, the change in the probability is -0.004 . Finally, (4) the probability of finding expenditures in machinery, equipment and animals changes 0.02 in the case of households with the same income range of (3). This coefficient is significant at the 5 percent level. Therefore, there is not consistent evidence that the expansion of Pahnal changed the probability of having expenditures in informal savings instruments.

Other important issue is the study of net financial flows into informal savings instruments and the effect of Pahnal's expansion on them. Ordinary least squares regressions with robust standard errors were used to do the net flows analysis. The specifications for the estimations are the same as in equations (1) and (2) of the paper. Table 13 presents the results. Evidence on crowding out (or crowding in) of net flows is not strong. Only few coefficients are significant and only in few cases there is a crowding out caused by the expansion of Pahnal. For example, net flows into loans to non-family members, machinery, equipment and animals seem to be reduced by the expansion of Pahnal; but once again, evidence is not conclusive in this matter.

According to the regressions' results, there is not strong evidence to support the presence of crowding out of informal savings instruments caused by the expansion of Pahnal in 1993. Also, in the cases where there was crowding out of informal savings by the system's expansion, the displacement was small in terms of percentage points of income.

VII. Conclusions

This paper focused in two main questions. First, it asks whether increasing financial access has an effect on the saving rates of low-income people. Second, it looks for

crowding out or crowding in of informal savings instruments caused by the expansion of the savings institute.

In the case of the first question, this paper has shown that the effects of increasing financial access on low-income people saving rate are statistically significant and of an important magnitude. The expansion of a Mexican savings institute (Pahnal) increased the average saving rate of affected households by 3 to 5 percentage points. This result is robust to different saving rate specifications and estimation techniques.

Furthermore, the effect was higher and significant for low-income individuals, who were the ones targeted by the expansion. Households with income per member lower than the minimum wage that were located in towns affected by expansion had, on average, a saving rate that was more than 5.7 to approximately 8 percentage points higher than those located in towns not affected by the expansion.

It is important to note that the effect of the expansion on the saving rate was always positive and significant only for the poorest households. This evidence shows that there was a clear targeting of Pahnal to low-income individuals. It is also in accordance with the analytical implication that only low-income people have limited access to financial institutions and therefore only they should be affected by the expansion.

Given that this paper deals with the exposure of households to the expansion of Pahnal, an estimate of the magnitude of this exposure was calculated. It was found that Pahnal's gross deposits represented 21 percent to 29 percent of total low-income people savings in typical cities in the sample at the end of 1994.

Lack of access to standard savings accounts could force households to save using informal instruments. This paper presents an analysis of possible informal savings instruments and its presence in the Mexican database. The first point to mention is that not many households reported expenditures (income) from these informal instruments. The average proportion of households reporting them was 5.61 percent.

The paper analyzes effects of the expansion on expenditures in informal savings instruments. The exercise considers the effects of Pahnal's expansion on the probability of reporting expenditures in informal savings instruments. Results show little effects of the expansion on this type of expenditures. Net flows into informal instruments were also analyzed. In both cases, evidence is not sufficiently strong to rule out or rule in crowding out of informal instruments. Also, the effects were, in general, small in terms of income.

From this research it can be concluded that, low-income people save a considerable fraction of their income when they have access to financial instruments and that it is hard to rule out the possibility that a substantial fraction of the increase in savings represents new savings.

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Table 1
Pahnal^{1/} Reform Statistics

	July '93	December '94
Balances (dollars)		
Total	49,967,742	93,258,065
Cuentahorro (short term instrument)	19,161,290	57,419,355
Tandahorro (long term instrument)	7,387,097	20,548,387
Old Instruments (bonds and monthly savings plan)	23,419,355	15,290,323
Cuentahorro and Tandahorro as % of Total Balances	53.13%	83.60%
Number Accounts^{2/}		
Total	83,300	228,500
Cuentahorro (short term instrument)	67,800	170,000
Cuentahorro accounts as % of total accounts	81.39%	74.40%
Tandahorro (long term instrument)	15,500	58,500
Tandahorro account as % of total accounts	18.61%	25.60%
Average Individual Account Balances (dollars)		
Cuentahorro (short term instrument)	283	310
Tandahorro (long term instrument)	477	323
Average of both instruments	319	313

^{1/} Mexican Savings Institute.

^{2/} Includes only Cuentahorro and Tandahorro.

Source: Pahnal.

Table 2
Pahnal's Expansion and Surveys Timeline

1992	1993	1994
4 th Quarter of 1992: National Survey of Income and Expenditure. The survey includes 10,530 households living in 366 towns.	Pahnal was expanded using the postal offices.	4 th Quarter of 1994: National Survey of Income and Expenditure. The survey includes 12,815 households living in 366 towns.
There were 67 towns with at least 1 Pahnal Office (none of them in a postal office).	By December 93, Pahnal had a total expansion of 98 offices in 34 towns. 27 towns didn't have an office before the expansion.	

Source: Pahnal

Table 3
Table of Means^{1/}

	1992		1994	
	Non-Expansion Towns	Expansion Towns	Non-Expansion Towns	Expansion Towns
Saving Rates (percentage points of income)				
1. With Housing Expenditures	10.95 (0.45)	4.06 (0.83)	8.27 (0.40)	6.44 (0.73)
2. Without Housing Expenditures	17.77 (0.43)	13.97 (0.80)	16.75 (0.38)	17.10 (0.72)
Income (1992 pesos)	4,939 (119)	7,904 (431)	4,695 (70)	8,022 (302)
Household Size	5.04 (0.03)	4.58 (0.05)	4.90 (0.03)	4.49 (0.05)
Age of Head	40.57 (0.14)	40.51 (0.28)	41.61 (0.14)	41.07 (0.27)
Education Indicator	2.20 (0.03)	3.46 (0.06)	2.31 (0.03)	3.64 (0.06)
# of Income Recipients	1.65 (0.01)	1.71 (0.02)	1.77 (0.01)	1.72 (0.02)
# of Kids	1.69 (0.02)	1.23 (0.03)	1.49 (0.02)	1.14 (0.03)
# of Observations	6893	1691	7667	1810

^{1/} Standard errors in parenthesis. Saving rates were calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to between -100 percent and 100 percent. Source: own calculations using the 1992 and the 1994 surveys of Income and Expenditures in Mexico.

Table 4
Average Saving Rates by Level of Household Income^{1/}
(percentages of total income)

	Saving Rate (including Housing Expenditures)	Saving Rate (excluding Housing Expenditures)
Household Income:		
Up to 1 minimum wage	-5.83%	3.26%
Between 1 and 2 m.w.	-0.33%	8.57%
Between 2 and 5 m.w.	6.99%	15.47%
Between 5 and 10 m.w.	18.93%	26.28%
Greater than 10 m.w.	27.48%	33.95%

^{1/} Saving rates were calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to between -100 percent and 100 percent.

Source: own calculations using the 1992 and the 1994 surveys of Income and Expenditures in Mexico.

Table 5
Saving Rates and Average Income for Towns that had
a Pahnal Expansion (Before and After the Expansion)^{1/}

	1992 (Pre-Expansion)			1994 (Post-Expansion)		
	Saving Rate with Housing ^{2/}	Saving Rate without Housing ^{3/}	Income (’92 pesos)	Saving Rate with Housing ^{2/}	Saving Rate without Housing ^{3/}	Income (’92 pesos)
Saving Rate constrained to (-1,1)						
Mean	4.0	14.0	7,904	6.0	17.0	8,021
Median	6.0	16.0	4,700	9.0	20.0	4929
St. Dev.	34.0	33.0	17,725	31.0	30.0	12,855
Max.	95.0	96.0	454,867	95.0	0.96	381,248
Min.	-98.0	-98.0	300	-99.0	-0.96	242
%-Change on means				58.62	22.41	1.48

^{1/} Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent. Saving rates were calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income.

Average income is in pesos of 1992. The consumer price index was used to deflate the 1994 observations.

^{2/} Consumption used for calculation on the saving rate includes housing expenditures.

^{3/} Consumption used for calculation of the saving rate does not include housing expenditures.

Source: own calculations using the 1992 and the 1994 surveys of Income and Expenditures in Mexico.

Table 6
Basic Analysis
Dependent Variable: Saving Rate with Housing Expenditures, Percentage Points
Standard Errors in Parenthesis^{1/}

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Income Per Member		3.51E-03 (8.36E-05)		2.58E-03 (3.72E-04)
1994 Dummy	-2.63 (0.59)	-2.86 (0.58)	-2.28 (0.73)	-2.80 (0.70)
System Expansion New Towns Dummy	-7.79 (1.61)	-8.32 (1.80)	-8.10 (2.01)	-7.96 (2.07)
System Expansion Town that had Pahnal Dummy	-7.30 (1.13)	-5.76 (1.74)	-7.06 (1.03)	-6.74 (2.22)
Interaction Expansion in New Town-1994	6.73 (2.52)	4.77 (2.40)	6.70 (2.54)	5.08 (2.19)
Interaction Expansion in Town that had Pahnal-1994	4.28 (1.52)	3.93 (1.45)	4.06 (1.43)	4.01 (1.71)
Dummy of Gender of Household Head (male=1)		5.95 (0.83)		5.60 (0.86)
Age of Household head		0.01 (0.03)		-0.02 (0.04)
Education Indicator Level (Head)		-1.56 (0.42)		-1.48 (0.58)
Square of Education Indicator		0.08 (0.05)		0.12 (0.07)
Household Head Blue Collar		-2.59 (0.99)		-3.12 (1.06)
Household Head Peasant		-0.92 (1.18)		-1.48 (1.29)
Household Head Employer		7.99 (1.34)		8.34 (1.60)
Household Head Self-employed		2.46 (1.02)		1.78 (1.23)
Irregular Reception of Income		5.10 (0.87)		4.69 (1.27)
Employment Stability		0.54 (0.55)		0.26 (0.58)
Medical Service		0.91 (1.03)		1.89 (1.21)
Number of Income Recipients in Household		3.99 (0.28)		4.09 (0.36)
% of Children in the Household		-2.21 (1.49)		-4.04 (1.97)
Interaction of % of Children and Availability of Medical Services		1.91 (2.14)		-0.18 (2.37)

Table 6 (continued)

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Constant	12.73 (0.43)	0.52 (2.32)	13.74 (0.53)	5.10 (2.90)
F-statistic	15.57	60.97		
N		18061		18061

^{1/} Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent. Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Consumption includes housing expenditures.

^{2/} State dummies are included in all regressions but are not presented. Regressions were also done without constraining the data. Results were similar to those presented here.

^{3/} Bootstrapped standard errors are calculated with 100 iterations.

Table 7
Basic Analysis
Dependent Variable: Saving Rate without Housing Expenditures, Percentage Points
Standard Errors in Parenthesis^{1/}

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Income Per Member		3.00E-03 (8.07E-05)		2.21E-03 (2.28E-04)
1994 Dummy	-0.94 (0.56)	-1.32 (0.56)	-0.87 (0.77)	-1.24 (0.68)
System Expansion New Towns Dummy	-5.71 (1.54)	-6.80 (1.74)	-6.08 (1.75)	-5.64 (2.32)
System Expansion Town that had Pahnal Dummy	-3.55 (1.08)	-3.15 (1.68)	-3.95 (1.33)	-2.46 (2.29)
Interaction Expansion in New Town-1994	5.73 (2.42)	4.21 (2.32)	7.06 (2.85)	3.22 (2.50)
Interaction Expansion in Town that had Pahnal-1994	3.31 (1.46)	3.16 (1.40)	3.43 (1.71)	1.80 (1.62)
Dummy of Gender of Household Head (male=1)		2.70 (0.80)		2.61 (0.96)
Age of Household head		-0.04 (0.03)		-0.07 (0.04)
Education Indicator Level (Head)		-1.28 (0.40)		-1.41 (0.44)
Square of Education Indicator		0.09 (0.05)		0.17 (0.05)
Household Head Blue Collar		-1.98 (0.95)		-2.90 (1.20)
Household Head Peasant		-2.27 (1.14)		-3.49 (1.37)
Household Head Employer		6.58 (1.29)		7.50 (1.47)
Household Head Self-employed		1.82 (0.99)		1.26 (1.18)
Irregular Reception of Income		4.23 (0.84)		3.88 (1.10)
Employment Stability		-0.14 (0.53)		0.02 (0.57)
Medical Service		-0.05 (1.00)		0.43 (1.15)
Number of Income Recipients in Household		2.90 (0.27)		3.09 (0.29)
% of Children in the Household		-5.32 (1.44)		-7.14 (1.83)
Interaction of % of Children and Availability of Medical Services		3.70 (2.07)		2.35 (2.24)

Table 7 (continued)

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Constant	19.72 (0.41)	17.68 (2.24)	20.86 (0.53)	22.98 (2.89)
F-statistic	4.46	48.27		
N		18061		18061

^{1/} Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent.

Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Consumption does not include housing expenditures.

^{2/} State dummies are included in all regressions but are not presented. Regressions were also done without constraining the data. Results were similar to those presented here.

^{3/} Bootstrapped standard errors are calculated with 100 iterations.

Table 8
Income per Member Dummies Analysis
Dependent Variable: Saving Rate with Housing Expenditures
Percentage Points, Standard Errors in Parenthesis^{1/}

	Robust Regression ^{2/} (Saving Rate between (-1,1))		Median Regression ^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
1994 Dummy	-3.05 (0.56)	-2.76 (0.56)	-2.40 (0.69)	-2.86 (0.76)
System Expansion New Towns Dummy	-11.56 (1.54)	-8.78 (1.75)	-10.86 (2.24)	-7.90 (2.24)
System Expansion Town that have Pahnal Dummy	-11.86 (1.08)	-7.19 (1.71)	-10.88 (1.30)	-8.01 (1.80)
Income Per Member up-to-1- Minimum-Wage	-40.82 (2.43)	-50.13 (2.51)	-39.47 (4.08)	-48.88 (3.53)
Income btw-1-2-m.w.	-26.05 (2.47)	-32.33 (2.50)	-24.81 (4.22)	-31.59 (3.56)
Income btw-2-5-m.w.	-21.43 (2.53)	-24.09 (2.50)	-19.99 (4.08)	-23.35 (3.33)
Income btw-5-10-m.w.	-10.24 (3.04)	-11.62 (2.95)	-9.56 (4.41)	-11.68 (3.67)
Interaction of Dummies 1994, Expansion in New Town and Income Per Member Bracket:				
Up to 1 Minimum Wage	9.08 (2.94)	8.10 (2.85)	7.12 (4.52)	7.74 (3.46)
1 to 2 Minimum Wages	8.95 (4.42)	4.97 (4.27)	7.62 (3.84)	3.68 (4.69)
2 to 5 Minimum Wages	8.80 (5.43)	9.64 (5.24)	9.93 (4.88)	5.82 (6.71)
5 to 10 Minimum Wages	-14.54 (7.18)	-12.89 (6.93)	-11.52 (9.97)	-7.43 (11.62)
Interaction of Dummies 1994, Expansion in Town that had Pahnal and Income Per Member Bracket:				
Up to 1 Minimum Wage	6.31 (1.81)	7.07 (1.76)	5.64 (1.91)	8.03 (1.74)
1 to 2 Minimum Wages	3.42 (2.11)	1.46 (2.05)	3.76 (2.18)	1.07 (2.21)
2 to 5 Minimum Wages	2.26 (2.40)	0.86 (2.32)	1.06 (2.53)	0.01 (2.49)
5 to 10 Minimum Wages	2.22 (4.63)	1.14 (4.47)	2.25 (4.35)	1.09 (5.88)

Table 8 (continued)

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/ 3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Dummy of Gender of Household Head (Male=1)		6.75 (0.82)		6.00 (0.89)
Age of Household Head		0.01 (0.03)		0.00 (0.04)
Education Indicator Level (Head)		-2.88 (0.42)		-2.81 (0.54)
Square of Education Indicator		0.12 (0.05)		0.14 (0.06)
Household Head Blue Collar		-1.72 (0.97)		-1.38 (1.04)
Household Head Peasant		0.84 (1.16)		0.98 (1.24)
Household Head Employer		6.60 (1.32)		7.12 (1.53)
Household Head Self-employed		2.47 (1.00)		2.57 (1.25)
Irregular Reception of Income		5.51 (0.86)		5.55 (1.15)
Employment Stability		-0.16 (0.54)		-0.51 (0.60)
Medical Service		-0.21 (1.02)		-0.32 (1.08)
Number of Income Recipients in Household		3.58 (0.27)		3.94 (0.35)
% of Children in the Household		2.69 (1.48)		1.89 (1.94)
Interaction of % of Children and Availability of Medical Services		3.86 (2.11)		4.61 (2.28)
Constant	48.26 (2.45)	48.30 (3.34)	47.43 (4.12)	48.61 (4.67)
F-statistic	86.79	42.79		
N		18061		18061

^{1/} Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent.

Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Consumption includes housing expenditures.

^{2/} State dummies are included in all regressions but are not presented. Regressions were also done without constraining the data. Results were similar to those presented here.

^{3/} Estimates were also done including the interactions of the 1994 dummy and the income per member level dummies. Results did not change significantly. All median regressions are calculated with bootstrapped standard errors with 100 iterations.

Table 9
Income per Member Dummies Analysis
Dependent Variable: Saving Rate without Housing Expenditures
Percentage Points, Standard Errors in Parenthesis^{1/}

	Robust Regression ^{2/} (Saving Rate between (-1,1))		Median Regression ^{2/3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
1994 Dummy	-1.36 (0.54)	-1.24 (0.54)	-0.87 (0.70)	-1.69 (0.59)
System Expansion New Towns Dummy	-9.29 (1.47)	-7.18 (1.69)	-8.78 (1.72)	-6.00 (2.38)
System Expansion Town that have Pahnal Dummy	-8.02 (1.04)	-4.60 (1.65)	-6.49 (1.27)	-5.35 (2.04)
Income Per Member up-to-1- Minimum-Wage	-37.10 (2.32)	-43.72 (2.43)	-35.43 (3.73)	-42.69 (3.39)
Income btw-1-2-m.w.	-22.53 (2.36)	-27.16 (2.41)	-21.09 (3.64)	-26.08 (3.36)
Income btw-2-5-m.w.	-18.33 (2.42)	-20.19 (2.41)	-16.06 (3.69)	-19.22 (3.31)
Income btw-5-10-m.w.	-7.78 (2.90)	-8.70 (2.85)	-5.17 (4.76)	-7.27 (3.91)
Interaction of Dummies 1994, Expansion in New Town and Income Per Member Bracket:				
Up to 1 Minimum Wage	7.84 (2.81)	6.85 (2.75)	6.22 (3.76)	6.80 (2.65)
1 to 2 Minimum Wages	6.71 (4.22)	3.78 (4.12)	8.56 (4.17)	4.70 (4.44)
2 to 5 Minimum Wages	8.17 (5.19)	9.03 (5.06)	5.29 (3.93)	9.65 (5.16)
5 to 10 Minimum Wages	-9.81 (6.86)	-7.55 (6.69)	-5.25 (6.88)	-0.09 (9.05)
Interaction of Dummies 1994, Expansion in Town that had Pahnal and Income Per Member Bracket:				
Up to 1 Minimum Wage	5.34 (1.73)	5.73 (1.70)	4.19 (2.17)	6.53 (2.02)
1 to 2 Minimum Wages	3.53 (2.02)	2.20 (1.98)	3.10 (2.04)	3.22 (2.45)
2 to 5 Minimum Wages	0.29 (2.29)	-0.36 (2.24)	-3.43 (2.13)	-2.68 (2.23)
5 to 10 Minimum Wages	0.05 (4.42)	-0.66 (4.32)	-2.73 (5.68)	-0.28 (4.58)

Table 9 (continued)

	Robust Regression^{2/} (Saving Rate between (-1,1))		Median Regression^{2/ 3/} (Saving Rate between (-1,1))	
	No Covariates	Adding Covariates	No Covariates	Adding Covariates
Dummy of Gender of Household Head (Male=1)		3.46 (0.79)		3.34 (0.91)
Age of Household Head		-0.04 (0.03)		-0.05 (0.03)
Education Indicator Level (Head)		-2.53 (0.40)		-2.76 (0.43)
Square of Education Indicator		0.12 (0.05)		0.17 (0.05)
Household Head Blue Collar		-1.19 (0.94)		-1.55 (1.11)
Household Head Peasant		-0.58 (1.12)		-1.20 (1.34)
Household Head Employer		5.21 (1.28)		6.03 (1.66)
Household Head Self-employed		1.79 (0.97)		1.45 (1.22)
Irregular Reception of Income		4.71 (0.83)		4.72 (1.06)
Employment Stability		-0.77 (0.53)		-0.76 (0.59)
Medical Service		-1.12 (0.99)		-0.74 (1.13)
Number of Income Recipients in Household		2.50 (0.26)		2.74 (0.28)
% of Children in the Household		-0.66 (1.43)		-2.01 (1.77)
Interaction of % of Children and Availability of Medical Services		5.44 (2.04)		6.63 (2.42)
Constant	51.65 (2.34)	59.16 (3.23)	50.80 (3.79)	60.72 (4.21)
F-statistic	83.89	36.01		
N		18061		18061

^{1/} Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent.

Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Consumption does not include housing expenditures.

^{2/} State dummies are included in all regressions but are not presented. Regressions were also done without constraining the data. Results were similar to those presented here.

^{3/} Estimates were also done including the interactions of the 1994 dummy and the income per member level dummies. Results did not change significantly. All median regressions are calculated with bootstrapped standard errors with 100 iterations.

Table 10
Means of Financial Outflows and Inflows to/from Informal Savings Instruments
(As Percentage Points of Household Income)^{1/}

	General	Non Zero Entries	1992		1994	
			Non Expansion Towns	Expansion Towns	Non Expansion Towns	Expansion Towns
ROSCAS/Savings Unions/ Savings Accounts/Stocks/Bonds						
Mean	4.45 (0.09)	16.25 (0.28)	3.69 (0.14)	3.45 (0.22)	5.08 (0.16)	5.65 (0.29)
N	18,061	4,949	6,893	1,691	7,667	1,810
Loans to Non-Family Members						
Mean	0.24 (0.02)	6.26 (0.48)	0.26 (0.03)	0.17 (0.04)	0.26 (0.04)	0.19 (0.04)
N	18,061	699	6,893	1,691	7,667	1,810
Foreign Currencies/Jewelry/ Precious Metals						
Mean	0.06 (0.01)	3.48 (0.29)	0.08 (0.01)	0.06 (0.02)	0.06 (0.01)	0.04 (0.02)
N	18,061	328	6,893	1,691	7,667	1,810
Land/Houses						
Mean	0.29 (0.03)	23.94 (1.74)	0.26 (0.05)	0.33 (0.08)	0.28 (0.04)	0.37 (0.11)
N	18,061	216	6,893	1,691	7,667	1,810
Machinery/Equipment/Animals						
Mean	0.24 (0.02)	20.28 (1.54)	0.29 (0.04)	0.26 (0.11)	0.19 (0.03)	0.26 (0.09)
N	18,061	217	6,893	1,691	7,667	1,810
Interest from Loans to Non-Family Members						
Mean	0.17 (0.01)	7.97 (0.53)	0.28 (0.03)	0.14 (0.04)	0.11 (0.02)	0.06 (0.02)
N	18,061	388	6,893	1,691	7,667	1,810
Used Appliances/Used Cars						
Mean	0.32 (0.03)	19.02 (1.09)	0.32 (0.04)	0.52 (0.10)	0.30 (0.04)	0.21 (0.06)
N	18,061	300	6,893	1,691	7,667	1,810

^{1/}Data was constrained to do the calculations. Only households with saving rates in the -100 percent to 100 percent interval were included. Only households with head older than 20 and younger than 65 were included and with income greater than 100 pesos (around 30 dollars in 1994). Standard errors in parenthesis.

Table 11
Means of Net Financial Flows into Informal Savings Instruments^{1/}
(As Percentage Points of Household Income)^{2/}

	General	Non Zero Entries	1992		1994	
			Non Expansion Towns	Expansion Towns	Non Expansion Towns	Expansion Towns
ROSCAS/Savings Unions/ Savings Accounts/Stocks/Bonds						
Mean	2.44 (0.09)	7.97 (0.30)	1.60 (0.14)	1.71 (0.24)	3.01 (0.16)	3.90 (0.30)
N	18,061	5,531	6,893	1,691	7,667	1,810
Loans to Non-Family Members						
Mean	-1.39 (0.06)	-10.33 (0.38)	-1.99 (0.11)	-0.92 (0.13)	-1.14 (0.08)	-0.61 (0.13)
N	18,061	2,431	6,893	1,691	7,667	1,810
Foreign Currencies/Jewelry/ Precious Metals						
Mean	0.04 (0.01)	1.98 (0.39)	0.04 (0.01)	0.03 (0.02)	0.04 (0.01)	0.04 (0.02)
N	18,061	367	6,893	1,691	7,667	1,810
Land/Houses						
Mean	0.13 (0.03)	9.38 (2.12)	0.09 (0.05)	0.24 (0.09)	0.14 (0.05)	0.20 (0.09)
N	18,061	260	6,893	1,691	7,667	1,810
Machinery/Equipment/Animals						
Mean	0.16 (0.03)	10.51 (1.69)	0.12 (0.05)	0.21 (0.10)	0.15 (0.03)	0.26 (0.09)
N	18,061	271	6,893	1,691	7,667	1,810

^{1/}Net financial flows are equal to expenditures minus income into informal savings instruments. Standard errors in parenthesis.

^{2/}Data were constrained to do the calculations. Only households with saving rates in the -100 percent to 100 percent interval were included. Only households with head older than 20 and younger than 65 were included and with income greater than 100 pesos (around 30 dollars in 1994).

Table 12
Probit Analysis of the Effect of Pahnal's 1993 Expansion on Financial Outflows and Inflows to/from Informal Savings Instruments^{1/} (Standard Errors in Parenthesis)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic Analysis^{2/}							
Interaction Expansion in New Town-1994	-0.035 (0.029)	0.013 (0.016)	-0.007 (0.002)	-0.007 (0.001)	0.000 (0.005)	-0.005 (0.007)	----
Interaction Expansion in Town that had Pahnal-1994	0.020 (0.020)	0.001 (0.008)	0.001 (0.004)	0.001 (0.004)	0.004 (0.005)	0.000 (0.006)	-0.004 (0.003)
Income per Member Dummies Analysis^{3/}							
Interaction of Dummies 1994, Expansion in New Town and Income Per Member Bracket:							
Up to 1 Minimum Wage	-0.054 (0.035)	0.013 (0.021)	----	----	----	----	----
1 to 2 Minimum Wages	0.035 (0.057)	-0.014 (0.013)	0.002 (0.010)	----	----	----	----
2 to 5 Minimum Wages	-0.083 (0.052)	0.019 (0.031)	----	-0.002 (0.005)	0.006 (0.015)	0.038 (0.046)	----
5 to 10 Minimum Wages	-0.134 (0.054)	-0.016 (0.016)	----	----	0.012 (0.019)	0.024 (0.040)	----
Interaction of Dummies 1994, Expansion in Town that had Pahnal and Income Per Member Bracket:							
Up to 1 Minimum Wage	0.022 (0.025)	0.024 (0.016)	-0.003 (0.005)	0.011 (0.008)	-0.001 (0.004)	-0.006 (0.006)	-0.005 (0.003)
1 to 2 Minimum Wages	0.004 (0.026)	-0.008 (0.009)	-0.001 (0.004)	0.007 (0.007)	-0.002 (0.002)	0.008 (0.011)	-0.005 (0.003)
2 to 5 Minimum Wages	-0.034 (0.027)	-0.001 (0.011)	0.009 (0.008)	-0.004 (0.001)	0.017 (0.012)	0.004 (0.013)	-0.002 (0.004)
5 to 10 Minimum Wages	0.060 (0.062)	0.000 (0.018)	-0.006 (0.002)	-0.003 (0.004)	----	0.001 (0.016)	0.004 (0.010)

(1) ROSCAS/Savings Unions/Savings Accounts^{4/}; (2) Loans to Non-Family Members; (3) Foreign Currencies/Jewelry/Precious Metals; (4) Land/Houses^{5/}; (5) Machinery and Equipment/Animals^{6/}; (6) Interest from Loans to Non-Family Members^{7/}; (7) Used Appliances/Used Cars^{7/}

^{1/} Financial outflows refers to expenditures or money invested by the household in different possible informal savings instruments. Table presents only interaction coefficients. Demographic variables and state dummies were included in the calculations. Coefficients represent the change in the probability caused by the dummy variable.

^{2/} Basic analysis includes interaction coefficients of Pahnal's expansion (in a town that didn't have an office before and a town that had an office before) and a 1994 dummy.

^{3/} Income per member dummies analysis includes the interaction of the level of income per member of the household with Pahnal's expansion and with the 1994 dummy, along with dummies for the income per member brackets.

^{4/} This concept includes also stocks and bonds, but its significance is expected to be small. The 1994 survey contains separate information for stocks and bonds. The number of positive values of stock and bonds in this survey is six. (ROSCAS means Rotating Savings and Credit Associations).

^{5/} This concept includes houses and land bought for use by the family or for rent or investment.

^{6/} These are machinery, equipment and animals to use in a business own by the family.

^{7/} These represent income received by the households from these categories.

Table 13
Effect of Pahnal's 1993 on Net Financial Flows to Informal Savings Instruments^{1/2/},
Percentage Points of Total Income (Standard Errors in Parenthesis)

	ROSCAS/ Savings Unions/Savings Accounts ^{5/}	Loans to Non-Family Members	Foreign Currencies/ Jewelry/ Precious Metals	Land/ Houses ^{6/}	Machinery and Equipment/ Animals ^{7/}
Basic Analysis^{3/}					
Interaction Expansion in NewTown-1994	0.00 (0.80)	0.35 (0.48)	-0.01 (0.03)	-0.61 (0.22)	-0.06 (0.42)
Interaction Expansion in Town that had Pahnal-1994	0.72 (0.50)	-0.60 (0.23)	0.03 (0.04)	0.06 (0.16)	0.04 (0.11)
Income per Member Dummies Analysis^{4/}					
Interaction of Dummies 1994, Expansion in New Town and Income Per Member Bracket:					
Up to 1 Minimum Wage	-0.78 (0.65)	0.24 (0.54)	0.07 (0.04)	-0.20 (0.22)	-0.48 (0.33)
1 to 2 Minimum Wages	0.20 (2.08)	0.25 (0.66)	0.04 (0.07)	-0.31 (0.22)	-0.75 (0.39)
2 to 5 Minimum Wages	2.63 (1.94)	0.88 (0.73)	-0.02 (0.04)	-0.68 (0.29)	-0.43 (0.40)
5 to 10 Minimum Wages	-6.90 (4.58)	0.31 (0.87)	-0.09 (0.05)	-0.58 (0.66)	1.01 (2.41)
Interaction of Dummies 1994, Expansion in Town that had Pahnal and Income Per Member Bracket:					
Up to 1 Minimum Wage	-0.05 (0.48)	-0.30 (0.26)	0.07 (0.04)	0.08 (0.21)	0.09 (0.14)
1 to 2 Minimum Wages	-0.09 (0.81)	-1.02 (0.34)	0.04 (0.06)	0.33 (0.23)	-0.23 (0.12)
2 to 5 Minimum Wages	1.18 (1.05)	-0.32 (0.40)	0.14 (0.09)	-0.16 (0.31)	0.44 (0.31)
5 to 10 Minimum Wages	3.84 (3.09)	0.77 (1.07)	-0.06 (0.06)	-0.21 (0.70)	-1.24 (0.45)

^{1/} Ordinary least squares with robust standard errors is the method used.

^{2/} Net financial outflows refer to expenditures minus income received by the household by different possible informal savings instruments. Table presents only interaction coefficients. Demographic variables and state dummies were included in the calculations.

^{3/} Basic analysis includes interaction coefficients of Pahnal's expansion (in a town that didn't have an office before and a town that had an office before) and a 1994 dummy.

^{4/} Income per member dummies analysis includes the interaction of the level of income per member of the household with Pahnal's expansion and with the 1994 dummy, along with dummies for the income per member brackets.

^{5/} This concept includes also stocks and bonds, but its significance is expected to be small. The 1994 survey contains separate information for stocks and bonds. The number of positive values of stock and bonds in this survey is six. (ROSCAS means Rotating Savings and Credit Associations).

^{6/} This concept includes houses and land bought for use by the family or for rent or investment.

^{7/} These are machinery, equipment and animals to use in a business own by the family.

Appendix 1

Effects of Financial Access on Homeowners and Non-Homeowners

Mexican National Surveys of Income and Expenditures have problems with housing expenditures data. There is not information on how imputed rents are calculated for homeowners; also, some of the imputed rents are not available in the surveys. Given this limitation, two saving rates were presented: one in which consumption included housing expenditures and other in which they were not included.

An additional, robustness test of the results is to divide the sample among homeowners and non-homeowners. Table A1.1 presents the estimates of the interaction coefficients for homeowners. In general, homeowners present the same effects as those found for all households in the survey. Nevertheless, the effects seem stronger in towns that had an office before the expansion. However, statistically the effects in towns with pre-expansion offices and in towns without pre-expansion offices were not different.

Table A1.2 presents the results of non-homeowners. In this case, the coefficients' degree of significance is lower, and they are of lower magnitude for households located in towns with pre-expansion offices. Nevertheless, the trends are sustained, especially for low-income people.

Table A1.1
Effects of Pahnal's Expansion on Homeowners' Saving Rates
Percentage Points (Standard Errors in Parenthesis)^{1/}

	Saving Rates with Housing Expenditures		Saving Rates without Housing Expenditures	
	OLS Regressions ^{2/}	Median Regressions ^{3/}	OLS Regressions ^{2/}	Median Regressions ^{3/}
Basic Analysis^{4/}				
Interaction Expansion in new town-1994	4.61 (2.82)	5.32 (3.04)	4.17 (2.73)	3.13 (3.49)
Interaction Expansion in town that had Pahnal-1994	5.62 (1.81)	7.40 (1.41)	4.90 (1.75)	5.19 (1.85)
Income per Member Dummies Analysis^{5/}				
Interaction of dummies 1994, Expansion in New Town and Income per member bracket:				
Up to 1 minimum wage	8.33 (3.37)	8.32 (3.53)	6.72 (3.27)	6.13 (4.35)
1 to 2 minimum wages	6.53 (4.92)	6.48 (4.53)	5.82 (4.76)	5.66 (5.13)
2 to 5 minimum wages	12.04 (6.08)	11.95 (6.10)	10.65 (5.89)	8.96 (5.80)
5 to 10 minimum wages	-6.80 (7.50)	0.11 (10.32)	-1.64 (7.26)	1.91 (6.11)
Interaction of dummies 1994, Expansion in Town that had Pahnal and Income per member bracket:				
Up to 1 minimum wage	8.00 (2.16)	10.11 (1.93)	7.33 (2.10)	8.30 (2.23)
1 to 2 minimum wages	3.83 (2.61)	3.11 (2.10)	4.18 (2.52)	3.81 (2.60)
2 to 5 minimum wages	3.65 (2.83)	0.92 (2.45)	2.34 (2.74)	-1.10 (2.98)
5 to 10 minimum wages	4.12 (5.57)	7.01 (6.01)	1.26 (5.40)	1.27 (5.79)
N	13,753	16,496	13,753	16,496

^{1/}Table includes only coefficients of interest. Demographic variables and state dummies were included in the calculations.

^{2/}Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent. Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Calculated with robust standard errors.

^{3/}Bootstrapped standard errors, calculated with 100 iterations.

^{4/}Corresponds to the specification of equation (1) in the paper.

^{5/}Corresponds to the specification of equation (2) in the paper.

Table A1.2
Effects of Pahnal's Expansion on Non-Homeowners' Saving Rates
Percentage Points (Standard Errors in Parenthesis)^{1/}

	Saving Rates with Housing Expenditures		Saving Rates without Housing Expenditures	
	OLS Regressions ^{2/}	Median Regressions ^{3/}	OLS Regressions ^{2/}	Median Regressions ^{3/}
Basic Analysis^{4/}				
Interaction Expansion in new town-1994	4.55 (4.61)	6.61 (5.05)	4.86 (4.40)	5.53 (5.11)
Interaction Expansion in town that had Pahnal-1994	0.13 (2.46)	-1.36 (3.41)	0.14 (2.35)	-1.76 (2.43)
Income per Member Dummies Analysis^{5/}				
Interaction of dummies 1994, Expansion in New Town and Income per member bracket:				
Up to 1 minimum wage	7.02 (5.28)	9.73 (6.71)	7.26 (5.04)	7.21 (5.82)
1 to 2 minimum wages	0.19 (8.62)	-0.75 (8.73)	-1.28 (8.22)	2.15 (5.49)
2 to 5 minimum wages	4.00 (10.29)	0.00 (12.29)	6.87 (9.82)	9.16 (11.85)
5 to 10 minimum wages	-55.24 (19.31)	-48.45 (23.49)	-49.93 (18.42)	-48.64 (37.04)
Interaction of dummies 1994, Expansion in Town that had Pahnal and Income per member bracket:				
Up to 1 minimum wage	3.85 (3.03)	4.55 (3.36)	2.96 (2.89)	4.29 (4.16)
1 to 2 minimum wages	-2.76 (3.33)	-2.46 (4.27)	-2.33 (3.17)	-2.49 (3.39)
2 to 5 minimum wages	-5.85 (4.07)	-6.02 (4.72)	-5.03 (3.88)	-7.58 (4.31)
5 to 10 minimum wages	-2.07 (7.57)	-5.04 (8.04)	-3.62 (7.22)	-10.49 (9.45)
N	4,308	4,775	4,308	4,775

^{1/}Table includes only coefficients of interest. Demographic variables and state dummies were included in the calculations.

^{2/}Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent. Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income. Calculated with robust standard errors.

^{3/}Bootstrapped standard errors, calculated with 100 iterations.

^{4/}Corresponds to the specification of equation (1) in the paper.

^{5/}Corresponds to the specification of equation (2) in the paper.

Appendix 2

Reverse Experiment Using 1989 and 1992 Observations

Using the 1989 and the 1992 Households' Income and Expenditure Surveys it is possible to construct a reverse experiment of the 1993 Pahnal's expansion. This reverse experiment is used as a validity test of the exogeneity of the institute's expansion. The 1989 survey contains information of 11,494 households. The survey is similar to those of 1992 and 1994 and it is also comparable.

This allows the construction of a control and an experimental group for the 1989-1992 period. Households located in towns that were going to have a new office of Pahnal, in 1993, form the experimental group. Households located in towns that were not going to be chosen for the 1993 expansion form the control group. Of course, given that the period of analysis here is 1989 to 1992, there should be no difference in experimental group's behavior and control group's behavior, because the expansion was done until 1993.

Results of the reverse experiment are shown in table A2.1. As can be seen, the differences in differences estimates are in general non-significant. Specifically, for the basic analysis, the coefficients are non-significant; only for the case of the interaction in a new town the coefficient is significant. For the income per member dummies analysis, the coefficients for the low-income people are in general non-significant. Results hold when different estimation techniques are used.

Table A2.1
Coefficients of Interest in the Reverse Experiment
Using the 1989 and 1992 Household's Income and Expenditure Surveys
Percentage Points (Standard Errors in Parenthesis)^{1/}

	Saving Rates with Housing Expenditures		Saving Rates without Housing Expenditures	
	Without Controls	With Controls ^{2/}	Without Controls	With Controls ^{2/}
Basic Analysis^{3/}				
Interaction Expansion in new town-1992	-1.67 (2.48)	-2.37 (2.42)	-5.55 (2.22)	-6.33 (2.20)
Interaction Expansion in town that would had Pahnal-1992	0.92 (1.64)	0.48 (1.61)	-1.45 (1.47)	-2.10 (1.44)
Income per Member Dummies Analysis^{4/}				
Interaction of dummies 1992, Expansion in New Town and Income per member bracket:				
Up to 1 minimum wage	-2.69 (2.74)	-2.54 (2.68)	-5.73 (2.51)	-5.79 (2.50)
1 to 2 minimum wages	0.30 (3.63)	-0.65 (3.46)	-4.72 (3.38)	-5.20 (3.26)
2 to 5 minimum wages	-7.34 (4.31)	-7.24 (4.22)	-12.66 (4.20)	-12.22 (4.20)
5 to 10 minimum wages	-18.09 (8.29)	-15.18 (7.72)	-18.82 (7.68)	-15.77 (7.25)
Interaction of dummies 1992, Expansion in Town that would had Pahnal and Income per member bracket:				
Up to 1 minimum wage	-0.93 (1.84)	0.99 (1.84)	-4.14 (1.70)	-3.38 (1.70)
1 to 2 minimum wages	1.54 (2.15)	-0.34 (2.11)	0.26 (2.00)	-0.96 (1.97)
2 to 5 minimum wages	3.12 (2.77)	1.89 (2.78)	0.31 (2.58)	-0.62 (2.59)
5 to 10 minimum wages	0.11 (4.98)	0.13 (4.92)	1.20 (4.64)	0.98 (4.64)
N	17,688			

^{1/}Table includes only coefficients of interest. Ordinary least squares with robust standard errors were used to perform the analysis. Calculations were done after cleaning the data for extreme values in the saving rates and low incomes. Specifically, the saving rates were constrained to be between -100 percent and 100 percent. Saving rates are calculated as the difference of quarterly income minus quarterly consumption divided by quarterly income.

^{2/} Demographic variables and state dummies were included in the calculations.

^{3/} Corresponds to the specification of equation (1) in the paper.

^{4/} Corresponds to the specification of equation (2) in the paper.