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Abstract*

This paper examines the effects of non-contributory pension programs at the federal and state levels on Mexican households' saving patterns using micro data from the Mexican Income and Expenditure Survey. The federal program by itself appears to reduce the saving rate of households whose oldest member is either 18 to 54 or 65 to 69. State programs by themselves have no significant effects on household saving rates in the smallest localities, but in larger localities they may reduce the saving of households with members in their sixties. The combination of both types of programs generally does not have statistically significant effects on households' aggregate saving, probably because each program seems to affect different population strata. No significant effects are found for households whose oldest member is age-eligible (70 and older). Within specific investment categories, evidence is found of increases in human capital and in durable and financial goods for some age groups. Finally, the paper provides evidence on household-level labor supply responses.

JEL classifications: D14, J26, O12, H55

Keywords: Non-contributory pensions, Saving, Mexico

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1. Introduction

In the last 15 years, many Latin American countries have implemented non-contributory (NC) pension programs for the elderly, spending on average 0.56 percent of GDP on them (Levy and Schady, 2013). These NC pensions, which are typically conditioned on age and residence requirements, attempt to reduce elderly poverty by distributing resources to the large proportion of seniors who do not qualify for a contributory pension.¹

Mexico has been no exception to this trend. Since 2001, several Mexican states, starting with the Federal District (DF), have gradually implemented their own NC pension programs in which eligible individuals receive a monthly cash transfer that is almost exclusively conditioned on age and state residence. By 2011, 16 of the 32 states had implemented such local programs (Aguila et al., 2011). On top of these local pension programs, in 2007 the federal government started its own: the *70 y Más* program. The latter initially paid about 40 USD per month to individuals age 70 and older residing in localities with up to 2,500 inhabitants—the smallest in the country.² This federal program was implemented with the explicit purpose of increasing the income of beneficiaries, and its rollout responded to the particularly low coverage of the contribution-based Mexican pension systems in rural areas.³ The program grew rapidly and was expanded to larger localities in the early years, reaching national coverage in 2012.

A potential concern with the increasing popularity of these pension schemes is that they might lead to a decrease in saving because they provide a substitute for contribution-based pensions, reduce the need for precautionary savings among the elderly and facilitate increases in consumption. An increase in the consumption of the elderly is not necessarily undesirable. However, by changing the expectations of younger individuals, NC pension programs might alter their overall saving patterns and investments in human and physical capital.

In this paper, we provide evidence on the potential effects of NC pension programs on the saving patterns of Mexican households. Specifically, we estimate how the combination of the *70*

¹ Many Latin American countries have a contribution-based social security system that is funded by employer and employee contributions. However, they also have a large share of the workforce that does not contribute to the system or does not contribute enough to guarantee a contributory pension when they reach old age.

² The program transfer is 500 Mexican pesos per month. To get the equivalent amount in U.S dollars, we used an exchange rate of 12.5 pesos per dollar, which was the average in the first six months of 2013.

³ The motivation section of the 2007 Rules of Operation of the program states “the Federal Government starts this support program for older adults, with the purpose of improving their income, and as a result, their living conditions.” Please refer to: “Acuerdo por el que se emiten y publican las Reglas de Operación del Programa de Atención a los Adultos Mayores de 70 años y más en zonas rurales para el ejercicio fiscal 2007” published in *Diario Oficial de la Federación* on February 28, 2007.

y *Más* program with state-level NC pensions affected saving rates using micro data from the Mexican Income and Expenditure Survey (ENIGH) and a difference-in-differences approach that exploits the geographical rollout of the 70 y *Más* program, together with the variation in the start of the state programs. We conduct the analysis for households whose oldest member is age-eligible, and also for different groups of households whose oldest member is younger than 70.

This approach yields a broader picture of the potential effects of NC pensions on saving and labor supply of their targeted population, and of individuals who are still young but might also respond to the incentives of such programs. This is relevant for several reasons. *First*, saving rates, which are an important element for the sustained growth that Mexico longs for, continue to be low in the country (around 24 percent of GDP according to Levy and Schady, 2013), and they could be further diminished by the ongoing expansion of these NC pensions programs. *Second*, state and federal programs add up to a significant amount of resources that are being transferred to the Mexican elderly. These resources can only be expected to increase in the near future.⁴ In fact, the current administration just lowered the eligibility age of the federal NC pension to 65 upon taking office, and the Mexican Congress has yet to discuss a reform that would double the pension amount and make it a permanent component of the Mexican social insurance system. In this context, it is even more relevant to shed some light on the potential effects that these programs have on the saving decisions of those individuals who are close to the eligibility age, and of those younger ones who will face the new set of rules. *Third*, to our knowledge, the literature on NC pensions in Mexico has not directly looked at the effects on the amount and composition of savings. This literature has estimated either the effect of the DF pension program or that of the 70 y *Más* program on the labor supply of beneficiaries and younger individuals who live with them (Juarez, 2010; Juarez and Pfutze, 2013; Galiani, Gertler and Bando, 2012), on the crowding out of the private transfers that beneficiaries receive (Juarez, 2009; Amuedo-Dorantes and Juarez, 2013), or on the mental health of beneficiaries (Galiani, Gertler and Bando, 2012). Two papers find a positive effect of the 70 y *Más* program on household expenditures, but none of them looks at either the amount or composition of saving (Amuedo-Dorantes and Juarez, 2013; Galiani, Gertler and Bando, 2012). Our study intends to fill the aforementioned gap in the

⁴ According to Levy and Schady (2013), the resources spent only on the 70 y *Más* program represent about 0.09 percent of Mexican GDP.

literature, and to be the first one to inform about the combined impact of the federal and state-level pension programs.

Our results reveal that the federal NC pension program by itself is associated with a reduction in the saving rate of two groups of households: those whose oldest member is either age 18 to 54 or 65 to 69 years old. The effects for both groups are quite robust across different saving definitions and identification and empirical checks. State NC programs by themselves have no significant effects on the saving rate of households in the smallest localities in Mexico, which were the first ones incorporated into the federal program, but we find some evidence of them reducing the saving of households with members in their sixties in larger localities. Finally, we find that, overall, the effects of the combination of the federal and state NC pension programs on the saving rate of households are mostly not statistically significant, which might be explained in part by each program having an effect on the saving of households in different population strata. No significant effects are found for households whose oldest member is age-eligible (70 and older), probably because the saving of this households is already low to begin with given their age.

A potential explanation for these findings is that: i) older households about to become eligible for the program decrease their saving rate precisely because they expect to receive the NC pension in a few years, and ii) younger households perceive a diminished need to transfer private resources to their elderly, who will now qualify for a NC pension. Regarding the latter explanation, these programs might allow younger households to reduce their private support and have more income left to consume. Indeed, previous evidence for Mexico shows a significant crowding-out effect of such programs on the transfers the elderly receive from other, presumably younger, households (Juarez, 2009; Amuedo-Dorantes and Juarez, 2013). In addition, these programs might reduce the longevity risk associated with elderly family members that do not qualify for a pension, thus also reducing also the need for precautionary savings among younger households.

We perform a series of identification and robustness checks to validate our main results, and they remain mostly unchanged. In addition, we present estimates of the effect of NC pensions on selected saving categories. We find increases in human capital investment induced by these programs in some age groups, likely reflecting increases in education investment among the relatively young and increases in health-related expenditures among the elderly. Positive

impacts are also found for investment in durable and financial goods. Finally, to better understand our findings, we conclude the analysis with some evidence of labor supply responses at the household level.

2. Background

2.1 Population Aging in Mexico

Although Mexico is still a relatively young country, it is experiencing an accelerated population aging process, due mainly to a steady increase in the life expectancy and a decrease in the number of births per woman. Figure 1 shows that 6 percent of the Mexican population was age 65 and older in 2010. As shown in the figure, a sustained increase in this percentage is expected in the following decades, until it reaches 16 percent in 2050. This is equivalent to a 2.7 times increase in the share of individuals age 65 and older in 40 years. A similar trend is observed for the percentage of the population age 70 and older, which is expected to grow from 4 percent in 2010 to 11 percent in 2050. The figure also highlights another well-known fact: due to the greater longevity of women, they are disproportionately represented among the elderly population, especially the oldest individuals.

Such a quick and steep increase in the relative importance of elderly individuals raises the need of adequately providing for them. Figure 2 emphasizes the challenge that the changes in the population age structure will pose for the future financial sustainability of both contributory and non-contributory pension systems. The anticipation of this change in the age structure of the population was probably one of the reasons behind the transition from a pay-as-you-go defined-benefit contributory pension scheme to a fully funded defined-contribution scheme in Mexico in 1997 and 2007.⁵ However, as shown in the next section, the main challenge facing the current Mexican contributory pensions system continues to be low coverage and contribution rates, which result in a substantial share of individuals who do not qualify for a pension when they reach retirement age.

Figure 3 shows the percentage of individuals age 65 and older in 2010 and 2030 for a selected group of Latin American countries, sorted by the percent increase in this variable

⁵ Both IMSS and ISSSTE, the largest social security institutions in Mexico, originally operated under pay-as-you-go schemes. IMSS was reformed in 1997 and ISSSTE in 2007. Both were changed to a fully funded, defined contribution, individual accounts schemes, and in both cases a transitional regime was allowed for workers who entered the system before those reforms.

between those two years. In 2010, Mexico had a proportion of individuals age 65 and older similar to that of countries like Colombia, Dominican Republic and Peru, and lower than that of South American countries like Chile, Argentina and Uruguay. However, the percent increase in this proportion from 2010 to 2030 in Mexico will be on the order of 88 percent—one of the five largest among the group of Latin American countries. In sum, although population aging seems to be a common trend among middle-income countries in Latin America, Mexico stands out as one of the countries likely to be hit harder by this phenomenon.

2.2 Overview of the Mexican Contributory Pension System

The contributory pension system currently operating in Mexico is primarily composed of two public institutes: the Mexican Institute of Social Security (IMSS) for salaried employees in the private sector, and the Institute of Health and Social Security for Government Employees (ISSSTE) for federal employees.⁶ These two institutes are mostly funded by employer and employee wage-based contributions which, together with a government social contribution, are deposited into individual saving accounts.⁷ According to the law, only salaried workers are required to save for their retirement through these institutes. Other types of workers, like the self-employed, are allowed to voluntarily participate in IMSS. However, in practice, only few of them do.

To qualify for a pension from IMSS, which as shown below is the main provider of this type of pensions, the worker must be at least 60 or 65 years old, depending on the type of pension, and have contributed for at least 1,250 weeks (approximately 25 years).⁸ After the 2007 reform, the eligibility rules for ISSSTE are the same. For both institutes, the amount of the pension granted is a function of the funds accumulated in the worker's individual account. If

⁶ The military and employees of Pemex, the national public oil company, and of state local governments are covered through their own social security institutes. Employer-provided private pension plans are very limited, and they are provided only to a small fraction of workers in addition to, and not in place of, IMSS coverage (Aguila et al., 2011).

⁷ These accounts are administered by private pension funds called AFOREs (by their Spanish acronym), and the worker can choose between them. This aspect was also part of the 1997 IMSS and 2007 ISSSTE reforms.

⁸ IMSS provides two types of pensions for the elderly: i) severance at advanced age pension (Cesantía en Edad Avanzada in Spanish) and ii) old-age pension (Pensión de Vejez). To be eligible for the first one, the worker must be at least 60 years old, have at least 1,250 contribution weeks, and have no job. At age 60, this pension pays 75 percent of the old-age one, with the percentage increasing with each year of age until reaching 100 percent at age 65. For the second one, the requirements are a minimum age of 65 and the same number of contribution weeks.

those funds are not enough, the government guarantees a minimum pension equal to 1 monthly minimum wage (MW) in the case of IMSS, and 1.5 monthly MW in the case of ISSSTE.⁹

Table 1 shows pensioners by institution and amount of the pension in 2013, according to the Mexican Employment and Social Security Survey.¹⁰ About 4.3 million individuals were receiving a contributory pension, which represents about 57 percent of the estimated population age 65 and older in that year.¹¹ Thus, a sizable share of the Mexican elderly do not benefit from this type of pensions. Regarding the amount of the pension received, the table shows that 54 percent of all pensioners receive a pension equivalent to 2 or less monthly MW, which is a relatively small amount. About 58 percent of pensioners are men, and 42 percent women. Women are less likely to end up benefiting from contributory pensions due to their relatively lower attachment to the labor force. However, about 54 percent of both male and female pensioners receive a pension equivalent to 2 or less MW, probably related to the higher labor force attachment of high-earning women.

Table 1 also shows that IMSS is the most important pension-granting institution by far with 73 percent of pensioners, followed by ISSSTE with 18 percent. As mentioned before, the coverage of other social security institutions and private pension funds is marginal, with 9 percent of pensioners. Pensions granted by ISSSTE and other institutions seem to be more generous than those granted by IMSS. Among IMSS pensioners, which are the majority, 67 percent receive a pension equivalent to 2 or less monthly MW, whereas only 20 percent of ISSSTE and 17 percent of other pensioners do.

As explained above, eligibility for a contributory pension and the amount of the pension granted depend on the amount contributed by the worker over her lifetime. In Table 2, we present some approximate calculations on the proportion of workers that contribute to IMSS, using different sources of data listed at the bottom of the table. The first row shows that the working-age population in 2013, defined as those individuals age 18 to 65, was about 70.2 million. Of these, only 48 percent (33.7 million) are salaried workers. So, as emphasized by Levy (2008), a substantial share of the working-age population is not being legally forced to save for

⁹ The minimum wage that is used explicitly as a reference for the minimum guaranteed pension in the IMSS law is the one applicable in Distrito Federal (DF), the capital of Mexico. In the 2007 ISSSTE law, the minimum pension is specified as 3,034.20 Mexican pesos, which is equivalent to 1.5 times the DF MW in that year, and it is annually updated according to the inflation in the consumer price index.

¹⁰ 2013 *Encuesta Nacional de Empleo y Seguridad Social* (ENESS), INEGI.

¹¹ According to CONAPO projections, the estimated number of individuals age 65 and older in 2013 was approximately 7.6 million.

retirement under the current system. Even among salaried employees bound to contribute to the either the IMSS or to the ISSSTE, compliance is far from perfect. Column 3 shows the approximate number of salaried workers in the private sector, who should all be contributing to the IMSS. This figure is calculated by subtracting from the total number of salaried workers those workers in the services sector who are in government or international organizations.¹² Of the 31.3 million salaried workers in the private sector (column 3), only 53 percent (16.4 million) are IMSS contributors. In addition, as Levy (2008) argues, the relatively low average length of stay in covered employment, especially among low-wage workers, and the frequent transitions between covered and uncovered employment are such that many workers could end up not being eligible for a contributory pension, even if they contributed at several points in their working life.¹³

How does the Mexican contributory system compare to others in Latin America? According to Bosch, Melguizo and Pagés (2013), the minimum number of contributing years required by the Mexican contributory system is similar to that of other defined-contribution (DC) systems in Latin America, such as Colombia (23 years), El Salvador (25 years) and Peru (20 years). However, it is lower than the years required in other countries with defined-benefit schemes, like Argentina (30 years) and Brazil (30/35 years).¹⁴ As a result, Mexico had a higher percentage of contributors out of total individuals employed in 2010 among the DC countries listed above, but lower than the average for the 19 Latin American these authors analyze (44.7 percent).¹⁵ In particular, the percentage of contributors in Mexico is much lower than the share in countries like Brazil, Chile and Uruguay, which have a comparable level of development.

2.3 Overview of Non-Contributory Pension Programs in Mexico

The implementation of NC pensions in Mexico, both at the state and federal level, started in 2001. That year, the first program of this kind was implemented in the state of DF. After 2001,

¹² This calculation implies that public sector workers in other sectors different from services, like PEMEX or other public companies, might still be counted as private sector employees.

¹³ Using IMSS and Consar administrative data from 1997 to 2006, Levy (2008) reports that the average high-wage worker spent 77 percent of a 10-year period in covered employment, whereas the average low-wage worker spent only 49 percent (see Chapter 5).

¹⁴ In their book *Better Pensions Better Jobs*, these authors provide a detailed overview of pension systems and their coverage in Latin America, as well as proposals for reform.

¹⁵ Please refer to Figure 4.1 in Bosch, Melguizo and Pagés (2013). The countries covered by their analysis in that figure are Argentina, Barbados, Belize, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Trinidad and Tobago, Uruguay and Venezuela.

other Mexican states gradually followed in implementing their own NC pension programs, typically conditioning the transfer paid only on age and state residence. Table B in the Appendix shows these states by program start date. By 2011, 16 of the 32 states had implemented such local programs (Aguila et al., 2011).

In 2007, the federal government decided to start its own NC pension program called *70 y Más*. This program initially paid about 40 USD per month to individuals age 70 and older residing in localities with up to 2,500 inhabitants—those with the lowest social security coverage precisely for being the most rural ones in the country. The program was gradually but rapidly expanded to larger localities, reaching national coverage in 2012. Table A in the Appendix shows the rollout by locality size. During these initial years, the program was run by the Ministry of Social Development (SEDESOL). Like other programs, the NC pension plan was aimed at reducing poverty.

Currently, the coverage of the *70 y Más* program is complete, at least in the rural areas first targeted by the program.¹⁶ Information about the coverage of state level programs is not always readily available; however, for the earliest program in DF, coverage rates have exceeded 90 percent, even in the richest municipalities.¹⁷ Table 3 shows the percentage of transfers from the federal program that were paid in rural areas. At the national level, approximately 47 percent of the *70 y Más* transfers in 2012 were paid to the three poorest deciles (I to III). The distributive impact seems to be more pronounced in rural areas, where 55 percent of program transfers reached the first three deciles compared to only 39 percent in urban areas. In addition, the percentage paid to each decile seems to decrease more or less steadily with income. As a result, only 1.9 percent of the program transfers reach individuals in the richest decile at the national level (1.7 percent in rural areas, 2.2 percent in urban ones).

According to Levy and Schady (2013), total transfers from the *70 y Más* program alone represented about 0.09 percent of GDP in 2011.¹⁸ This is small compared to other countries in Latin America where, on average, NC pensions account for 0.56 percent of GDP. In fact, of the countries they analyze, Mexico has the fifth-lowest share of GDP spent on NC pensions, not including state-level programs. This could be explained by the fact that the eligibility age of the

¹⁶ Please refer to “Informe de la Evaluación Específica de Desempeño 2008,” published by Consejo Nacional de Evaluación de la Política de Desarrollo Social, and available at: www.coneval.gob.mx.

¹⁷ For basic statistics on the DF NC pension program, see the state government website: <http://www.redangel.df.gob.mx/>

¹⁸ Please refer to Table 4 in their article.

majority of NC pension programs studied by Levy and Schady (2013) is either 60 or 65, instead of 70. In addition, the average transfer from these programs is 178 USD per month, which is 4.5 times the monthly transfer from *70 y Más* (40 USD). The combination of a higher eligibility age and a relatively less generous pension makes this Mexican federal program appear less onerous.

However, the budget dedicated to this program, as well as the program significance, are likely to increase in the future. In 2012, the new administration lowered the age cutoff of the federal program to 65 years old upon taking office. Shortly after, in 2013, a constitutional reform set the grounds for a universal pension as individuals turn 65 years old. The details of implementation were left to be regulated in follow-up legislation. This proposal establishes 65 as the initial eligibility age and doubles the pension to 1,092 pesos per month—about 51 percent of the minimum pension guaranteed to a worker by IMSS after 25 years of contributions. These parameters could substantially increase the cost of NC pensions in Mexico, not only as a direct consequence of lowering the age cutoff and increasing the pension amount, but also by increasing the value of NC pensions and providing additional incentives to workers for dropping out of the contributory system. This proposal has not yet been approved by the Senate.

3. Related Literature

3.1 The Impact of Social Programs on Private Saving

For quite some time, economists and policymakers have been concerned about the potential impact that social programs might have on individuals' incentives to save. Individuals save in order to finance future consumption, with one of the primary reasons for saving being building a nest egg for retirement.¹⁹ In that regard, programs like Social Security in the United States are likely to reduce the incentive to save by providing seniors with a monthly paycheck from the government. The negative impact of Social Security on saving has been confirmed by many scholars (e.g., Leimer and Richardson, 1992; Engen and Gale, 1996; Feldstein, 1996). And, likewise, it has been shown that countries that have either privatized their retirement programs or never offered one, as in the case of Chile and Singapore, respectively, have enjoyed high private saving rates (Marcel and Arenas, 1992; Ferrara, Goodman and Matthews, 1995).

¹⁹ Another key determinant of private saving includes the ability to finance consumption during periods of economic uncertainty. In that vein, unemployment insurance has been shown to reduce the incentive to accumulate some precautionary savings (Engen and Gruber, 2001).

Nevertheless, as noted by Poterba (1996), the main issue with the empirical literature has been identification. To the extent that cross-sectional variation in Social Security stems from lifetime income, which is tied to an individual's work history and, therefore, to her non-Social Security savings, it becomes rather difficult to isolate the impact of Social Security on savings. Furthermore, to the extent that individuals of the same age will have similar Social Security benefit schedules, it is hard to get the needed variation in Social Security benefits across similar households.

3.2 The Effects of Non-Contributory Pensions

What do we know about the impact of NC pensions on savings? Previous empirical studies for NC pensions have not directly looked at their effects on the amount and the composition of household or individual saving. Instead, the literature has been more interested in evaluating the affordability of NC programs, as well as their impact on their intended outcomes, such as reducing elderly poverty and inequality, as well as on unintended outcomes, such as impacts on labor market participation (see, for example, Ferreira-Coimbra and Forteza, 2005, or Cruces and Bérigolo, 2013, for Uruguay, Olivera and Zuluaga, 2013, for Colombia and Peru, or Johnson and Williamson, 2008, for a range of countries).

Focusing on Mexico, in particular, the literature has primarily concentrated on assessing the effect of the DF pension program or that of the *70 y Más* program on the labor supply of beneficiaries and younger individuals who live with them (Juarez, 2010; Juarez and Pfitze, 2013; Galiani, Gertler and Bando, 2012), on the crowding-out of the private transfers that beneficiaries receive (Juarez 2009; Amuedo-Dorantes and Juarez, 2013), or on the mental health of beneficiaries (Galiani, Gertler and Bando, 2012). Two papers find a positive effect of the *70 y Más* program on household expenditures, but none of them looks at either the impact on the amount or composition of savings (Amuedo-Dorantes and Juarez, 2013; Galiani, Gertler and Bando, 2012). With this study, we aim to address this gap in the literature by examining how NC federal and state programs have impacted household savings and their composition. We exploit the geographic and temporal variation inherent in the rollout of these programs to isolate the impact that NC pensions might have on private savings.

4. Data

We use the harmonized waves of the Mexican Income and Expenditure Survey (Encuesta Nacional de Ingresos y Gastos de los Hogares, ENIGH) for the period 2000-2012. The survey is carried out every two years by the Mexican Statistical Institute (Instituto Nacional de Estadística, Geografía e Informática, INEGI, at <http://www.inegi.gob.mx>). The ENIGH covers all household expenditures, including expenditures on education, health, durable assets, micro-enterprise investments, financial asset accumulation, real estate, food, transportation and personal care expenditures. Whereas income from different sources is observed for each individual in the household, expenditures are reported at the household level only. As a result, the household will be our unit of analysis.

We work with various definitions of saving. The first one is monetary saving, which is just the difference between the monetary values of income and consumption. Monetary income includes the standard income categories, like labor, business, rent, financial and transfer income. Monetary consumption includes cash expenditures on all categories, including durable goods (food, education, health, personal care, electronics, furniture, vehicles and housing, among others).

The second measure of saving adds in-kind income (in-kind labor payments, transfers and gifts) and consumption (own consumption and the estimated rent for homeowners) to the monetary measures described above. Including in-kind items has the advantage of taking into account sources of income and consumption that are important for certain households, like own consumption for rural households. However, a potential disadvantage is that in-kind items are subjectively valued in the ENIGH survey.

The third measure of saving is monetary income minus monetary consumption of non-durables. For this measure, we exclude from consumption those categories that represent other forms of saving, like investment in human capital (health and education), housing and real estate, and purchases of durable goods (electronics, machinery, vehicles).²⁰ For all three definitions, we focus on saving rates, i.e., the difference between income and consumption, divided by the corresponding income measure.

²⁰ In a previous study of overall household saving patterns in Mexico, Attanasio and Székely (1998) also use the second and third measure of saving and ENIGH data for the period 1984-1996.

Additionally, we look separately at several components of saving as investment in human capital (education and health), durables, real estate and financial assets (the sum of bank deposits, loans to others, and net purchases of stocks, bonds, and other financial market investment instruments). For these components, we also compute the saving rate with respect to household income.

The ENIGH data do not have locality identifiers or size, but divides the sample in four different strata according to locality size: localities with less than 2,500 inhabitants (stratum 4), localities with 2,500-14,999 inhabitants (stratum 3), localities with 15,000-99,999 inhabitants (stratum 2) and localities with 100,000 or more inhabitants (stratum 1). We will use this classification for both our descriptive analysis and estimation, as the *70 y Más* program was rolled out according to locality size.

5. Descriptive Evidence

5.1 Summary Statistics by Year

Table 4 presents the mean and median saving rates, according to the various definitions of savings discussed above, for the full sample of households in our data by year. The top panel shows the means, calculated using the ENIGH sampling weights. The first two rows show mean saving rates when using monetary income minus consumption, and also when adding in-kind items to both income and consumption. They are negative and become larger in absolute magnitude starting in 2008. The third row shows saving rates when consumption excludes durable goods (instead considered part of savings). Mean saving rates are positive, ranging between 2 to 13 percent of monetary income between 2000 and 2006. However, with the recession, saving rates drop precipitously and, while they seem to progressively recover over time, they are still equal to -10 percent in 2012.

If we look at the various components of savings, there is evidence of a significant investment in education and health from 2000 through 2006, when those savings rates hovered around 10 percent. However, they drop by half from 2008 onwards. Something similar, although at a significantly smaller rate, is observed for savings in durable goods. They fluctuate around 3 percent over the first part of the decade, to drop after 2008. Savings in real estate assets hover

around 1 percent for most of the time period, becoming negative, albeit small, in 2012.²¹ Financial savings were likewise rather small in 2000 and 2002 (averaging 1 percent of household income), but steadily increased from 2004 to 2008, when they reached 3.5 percent. In 2008, they dropped to approximately 1.7 percent and became negative (-2 percent) by 2012. Overall, mean saving rates using these various components fluctuated between -2 percent and 4 percent over the time period under analysis.

The fact that most of overall mean saving rates in the top panel of Table 4 are negative is probably due to the presence of large negative outliers. This is confirmed by the fact that, as shown in the bottom panel, median saving rates are mostly positive. Median saving rates when including in-kind items in income and consumption are the lowest (ranging between 2.5 and 9 percent of income), followed by those obtained when using only monetary variables (ranging between 8 and 14 percent of income). The median saving rates that include in-kind items are roughly comparable to those reported by Attanasio and Székely (1998), who also use the ENIGH data for the period 1984-1996.²² Median saving rates when excluding the consumption of durables are the largest, ranging between 14 to 22 percent of income. Because most saving is done by a small fraction of the population, the median saving rates for the various components are equal to zero, with the exception of savings in human capital, which ranges between half a percent and 5 percent of household income over the period. Overall, the median saving rate computed from adding up these components fluctuates between 2.6 percent and 7 percent for the 2000-2012 period.

In sum, for the most part, median saving rates did not change much over the 2000-2008 period. Nevertheless, they decreased sharply after 2008 and had not yet recovered their 2008 level by 2012. Once again, this might be attributed in part to the impact of the 2009 recession.

5.2 Graphical Analysis of Saving Trends

We next graphically depict median saving rates over time, according to a variety of household level descriptors, including locality size; age and educational attainment of the household head; and by household monetary income deciles. For the sake of brevity, we display the figures for

²¹ The only atypical value of housing investment during the whole period is that corresponding to 2008 (equal to 16 percent). We ignore this atypical value in this descriptive discussion.

²² For that period, Attanasio and Székely (1998) report median saving rates, including in-kind income and consumption items, ranging between 2 and 6 percent.

the overall aggregate measure of monetary savings, as well as for a few prevalent saving components, such as human capital investments and financial savings.

Figures 4-7 show median monetary saving rates according to the aforementioned household characteristics. A few findings are worth noting. Focusing first, on median saving rates by locality size, we see that the two tend to be positively correlated. Consistently, during the period 2000-2012, households in the largest localities in the country—those with more than 100,000 inhabitants—had the highest saving rates, whereas households in the smallest localities—those with less than 2,500 inhabitants—had the lowest ones. In addition, the gap in median saving rates between these two groups of households increased over time. In 2000, the difference in the median saving rate between the largest (9.7 percent) and the smallest localities (6.6 percent) was about 3 percentage points, whereas by 2012 that difference had reached 10 percentage points. Between 2004 and 2008, households in all strata experienced an increase in their median saving rates and a sharp decrease after 2008, possibly due to the financial crisis. Households in the two lowest strata end up with similar median saving rates, both lower than in 2000. The two highest strata also end up with a similar saving rate in 2012, which is only slightly higher than in 2000.

When we look at median saving rates according to the age of the household head, we find that the three youngest groups (12-45 years old) had median monetary saving rates that were below 10 percent, whereas those of older groups were between 10 and 23 percent. While differences in saving rates are relatively small among households with the eldest household heads, households whose heads are 56-65 years old had the highest median saving rates for most of the period (15-23 percent of income); followed by those with 66 to 70 years old heads (11-20 percent). Household whose heads were 81 years old or older had the lowest median saving rates among these older groups (7.5 to 13 percent) in most years. These patterns are broadly consistent with younger and elderly households having relatively lower saving rates when compared to households approaching retirement age (56-65 years old).

As one would expect, median saving rates also differed according to the educational attainment of the household head. We distinguish among households whose heads had no formal or only elementary education, those whose heads had a secondary education (middle high, high school and teacher's degree, called "normal"), and households whose heads had a tertiary education (college or more). Households whose heads had a secondary education or less had

fairly similar saving rates between 2000 and 2008 that fluctuate between 8 and 12 percent. During the same period, households whose heads were highly educated had significantly higher saving rates ranging between 13 and 23 percent. After 2008, the three education groups experienced a drop in saving, which was most pronounced for the highly educated group, followed by the group with a secondary education. This could be due to the financial crisis affecting high and mid-level education workers relatively more through financial losses and reduced employment in manufacturing.

Lastly, median saving rates also significantly differ by monetary income decile. The lowest saving rate corresponds to the poorest households (those in the first decile), whereas the highest saving rate corresponds to the richest households (those in the tenth decile). Between those extremes, households in each income decile saved more than those in the one right below them, but less than those in the one right above them. Therefore, the ordering of median saving rates matches that of income deciles. In 2000, the first decile had a negative median monetary saving rate (-11 percent), which decreased consistently in subsequent rounds and reached large negative levels starting in 2008. The second and third deciles started with saving rates close to zero in 2000, but experienced a decrease in those rates, reaching negative levels in 2012. In general, from 2000 to 2012, households in deciles 1 to 7 experienced a decrease in their median saving rate, which was relatively larger for those in the lower deciles. Households in income deciles 8 to 10 experienced a slight increase in their savings between 2006 and 2008 and, while their median saving rate decreased from 2008 to 2010, it stabilized thereafter. Overall, however, their median saving rates were not that different in 2002 and 2012. In sum, during the decade being examined, saving rates of relatively poor households consistently dropped, whereas those of relatively rich households remained practically unchanged.

To conclude, we also exhibit household median saving rates in human capital and financial assets.²³ Overall, investments in human capital exhibited the expected patterns. For instance, they are between two and three times as large among households headed by individuals between 26 and 55 years of age, more likely to have school-age children. Significant differences in human capital investments according to the educational attainment of the household head and the household's income level are observed, with more educated heads and richer households

²³ Similar graphs for savings in durable and real estate assets are available from the authors. The patterns exhibited by savings in durable assets closely resemble the ones for financial savings. For real estate assets, however, median saving rates hover around zero for all groups.

investing significantly more. However, median saving rates in human capital were rather similar for most localities, except for those with less than 2,500 inhabitants, where median savings were lower. And, once more, all significantly dropped to a similar level in 2008 and, in most instances, had not yet recovered by 2012.

Median household financial saving rates look, however, somewhat different. Because of the limited share of households engaging in this type of saving, their median is zero for all age groups. However, when we distinguish according to the educational attainment of the household head, we observe a significant increase between 2002 and 2006, when these saving rates climbed up from 0 to about 12 percent for households whose heads had a tertiary education. Then, they dropped back to 0 in 2008, and were still there in 2012. We also see how households whose heads only had a primary education were probably indebted during 2010-2012, as their median financial saving rates became negative. We also observe the expected patterns of financial saving by household income decile, with only households in the top 3 income deciles exhibiting median rates above zero. After 2008, only households in the top income decile had positive median saving rates in this category. Finally, it is worth noting that most of the saving in financial assets takes place among households residing in large localities. Only for that group did median financial saving rates climb above zero, although they remained fairly small, between 2004 and 2008.

In what follows, we control for the role played by these household level characteristics in explaining saving patterns, while paying special attention to how state-level and federal non-contributory pension plans might have altered household saving rates. As shown in Table 4, mean saving rates are impacted by large negative outliers, in particular. Therefore, in what follows we trim our sample, excluding households with monetary saving rates in the bottom and top 2 percent of the distribution for the whole period.²⁴

6. Micro-level Analysis

6.1 Empirical Strategy

Our main aim is to explore how state and federal NC pensions are impacting household saving rates. To that end, we divide households into 5 age groups according to the age of their oldest member: 18-54, 55-59, 60-64, 65-69, 70 and older. In the years covered by our data, only

²⁴ This results in dropping 6,068 households in all of the period 2000-2012.

households in the oldest group qualified for the federal and state NC pensions, depending on the locality size strata and the state in which they resided. However, these NC programs could potentially affect the saving decisions not only of the main beneficiaries, but also that of other age groups. Thus, we estimate the following benchmark equation for households in each age group:

$$(1) S_{hlst} = \alpha + X_h\beta + \gamma_1 SNCP_{st} * FNCP_{lt} + \gamma_2 FNCP_{lt} + \gamma_3 SNCP_{st} + \gamma_4 SNCP_{st} * tloc_{lt} + \gamma_5 SNCP_{st} * post + \theta_s + \rho_l + trend + \varepsilon_{hlst},$$

where S_{hlst} is the saving rate of household h in locality size l state s at time t , X_h is a vector of household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education groups), $SNCP_{st}$ is a dummy equal to 1 if the state s , where the household resided, had a NC local pension program at time t , $FNCP_{lt}$ is a dummy for whether the household resided in a locality stratum l , where the *70 y Más* federal program operated at time t . For our main results, we compare only households in localities with less than 2,500 inhabitants (stratum 4), in which the federal program started in 2007, with those in localities with 100,000 or more inhabitants (stratum 1), which did not have the program until after 2012. Thus, the variable $FNCP_{lt}$ is the interaction of $tloc$, a dummy for stratum 4, and $post$, a dummy for after 2007. We also include state (θ_s) and locality strata (ρ_l) fixed-effects, plus a time trend, to account for any time-varying factors in saving rates not related to the NC programs. In all estimations, standard errors are clustered at the state level.

In the above equation, the coefficient γ_1 captures the combined effect of the federal and state-level NC pension programs on the saving rate of households. The coefficients γ_2 and γ_3 capture the separate impacts of the state and federal NC pension programs, respectively.

6.2 Main Results

Do NC pension programs lower household saving rates? Table 5 and Table 6 address this question using various measures of household saving. Table 5 shows the results when defining saving as either: i) the difference between monetary income and expenditures (Panel A), ii) the difference between income and expenditures when we include in-kind items in both (Panel B), and iii) the difference between monetary income and expenditures when we only include non-durable goods in the latter (Panel C). In each of the three panels, the first row shows the *combined* effect of being in a locality and state where both NC programs operate, whereas the

second row shows the effect of the federal NC program alone, and the third row displays the impact of the state NC program.

For most age groups, the coefficients on the combined impact of the state and federal NC programs are generally negative, but not statistically different from zero. Only households whose oldest member is 65 to 69 years old report saving *increases* of approximately 14 percentage points when we look at the first measure of monetary saving, but the effect is never present for the alternative measures of saving.

Most of the impact of NC pension programs on household saving originates from the federal NC pension program. In particular, for all three measures of saving discussed above, households whose oldest member is 65 to 69 years old appear to significantly *curtail* their saving rate anywhere between 8 and 12 percentage points. In addition, the federal NC pension program also appears to reduce monetary, as well as monetary plus in-kind saving of households whose oldest member is 18 to 54 years old by approximately 4 percentage points. Finally, the federal NC pension program also lowers monetary plus in-kind saving of households eligible for these programs, i.e., those whose oldest adult is age 70 and older, by approximately 7 percentage points, but only significant at 10 percent.

Do state NC programs have any impact on household saving? The evidence here is significantly weaker, with sporadic impacts on different households depending on the measure of saving being used. For example, when we restrict our attention to monetary saving, the state NC pension programs appear to reduce the saving of households whose oldest member is 60 to 64 years old only. If we add to the monetary measure of saving in-kind items, we find that the state NC pension programs lower the saving rates of younger households whose oldest member is 18 to 54 years old by roughly 5 percentage points. Lastly, using the broadest measure of saving, which adds non-durable items to monetary plus in-kind saving, state NC pension programs curtail saving by households whose oldest member is 65 to 69 years old by 4 percentage points, although this effect is significant at 10 percent only.

In sum, according to our results, it is the federal NC pension program that appears to have had a more consistent impact on the saving of two groups of households, in particular: i) younger households, whose oldest member is 18 to 54 years old, and ii) older households nearing the eligibility age for the NC pension programs. A potential explanation for the lower saving rates of younger households is the lesser need to save to support age-eligible parents or close relatives to

whom they would transfer resources in the absence of a federal NC pension program. In this vein, previous studies for Mexico have found a significant crowding out of such private transfers, after the implementation of state NC pension in DF (Juarez, 2009) and the *70 y Más* federal program (Amuedo-Dorantes and Juarez, 2013). These crowding out estimates range from 30 to 80 percent, which implies that a significant fraction of resources of the NC programs could be redistributed to younger households, potentially increasing their current income and decreasing their saving rate. In addition, these programs might reduce the longevity risk coming from their uncovered elderly relatives by providing a public transfer to them for the rest of their lives, thus also reducing the need for precautionary savings. The impact of the federal NC pension program on the saving of households whose oldest member is close to reaching eligibility (age 60-69) fits well with the literature on precautionary savings.

6.3 Identification Tests

The validity of the interpretation given to the estimates in Table 5 rests on the assumption that differences in saving rates between households exposed to state and/or federal NC programs and similar unexposed households are not pre-existent. To assess whether that was indeed the case, we construct a lead dummy for the year preceding the implementation of the NC program in our data.²⁵ We then interact that lead dummy with both the state and federal NC program dummies, and include those interaction terms in the estimation of equation (1). If there were pre-existing trends driving the NC program impacts observed herein, we would expect these placebo interaction terms to produce statistically significant coefficients in the same direction of the effects discussed above. The results of this test are shown in Table 6. Because the results in Table 5 using the three different measures of saving are similar, we focus our attention on the first measure of monetary saving.

The negative impact of the federal NC program in either younger households (those whose oldest member is 18 to 54 years old) and older households (those whose oldest member is nearing the eligibility age, *i.e.* 65 to 69 years old) remains, even though it becomes significant at 10 percent only for the older group, with no statistically significant placebo interaction terms. It is also reassuring that the point estimates are similar to the ones in Table 5 despite the inclusion

²⁵ Because our data refer to 2000, 2002, 2004, 2006, 2008, 2010 and 2012, if the NC programs was implemented in a particular state in 2004, as in the case of Chihuahua and Nuevo Leon, the lead dummy will refer to the year 2002. If the NC program was implemented in 2005, as was the case in Veracruz, the lead dummy will refer to 2004.

of the placebo interaction terms. In sum, the negative impact of the federal NC program on the saving of younger and older households nearing the eligibility age for the *70 y Más* program in Table 5 does not appear to be the byproduct of a pre-existing difference in saving between treated and non-treated households.

6.4 Robustness Checks

In addition to the identification tests in the previous section, we perform an additional empirical check to assess the sensitivity of our findings to the choice of locality strata for estimation. Specifically, we re-estimate equation (1) using households in all locality strata, instead of using only those in strata 1 and 4. We redefine our federal NC pension program variable to be equal to 1 for each locality stratum after such stratum was incorporated into the program (see Table A in the Appendix). We present the results of this exercise in Table 7. According to the estimates in Table 7, monetary saving in households whose oldest member is 65 to 69 years of age continues to significantly drop by approximately 9.4 percentage points due to the implementation of the federal NC program. A drop of 2.7 percentage points is observed for the saving of households whose oldest member is 18 to 54 years old, due to the same program. Both estimates are a bit smaller, but similar in magnitude to those obtained in Table 5 when we restrict our sample to only households that were first treated (stratum 4) and never treated (stratum 1). In addition, including households in all population strata yields a negative effect of state NC pension programs of approximately 4.6 percentage points on the saving of households in the 60-64 and 65-69 age groups, suggesting that these programs might be reaching households in localities larger than 2,500 inhabitants.

We perform a similar estimation including all locality strata, but allowing the effect of federal and state NC pension programs to vary by stratum. Stratum 1 is the reference one. Results are displayed in Table C in the Appendix. The most remarkable finding is that the effect of the federal NC program alone for households in the 65-69 and 18-54 age groups in stratum 4 are very similar to the effects captured in our main results (-0.129 and -0.036, respectively). The effects of state NC pension programs are negative and around 4.6-4.8 percentage points for households whose oldest member is in her sixties, and no significant variation across strata is found.

6.5 Understanding the Negative Impact of NC Pensions on Savings

6.5.1 The Impact of Non-Contributory Programs on Saving Components

The estimates, thus far, refer to aggregate household saving. A natural question is whether the observed impact of NC programs is due to their impact on a particular saving category. To answer that question, Table 8 displays the impact of the state and federal NC programs on investments in human capital, durable goods, real estate and financial assets. Of these, the first three categories are included as expenditures in our monetary saving definition, whereas financial investment is not.²⁶ Among households whose oldest member is age 18-54, federal NC programs seem to increase investments in human capital by approximately 2 percentage points. A potential explanation for these positive effects is that the increase in income, due to a diminishing need for the transfer of resources to the elderly, might be partially reallocated to young individuals through an increase in education investments. A similar result is obtained for households in the 55-59 age group. The other groups of households whose investments in human capital are increased by the federal NC program are those whose oldest member is at least 65 years of age. Given their age, part of this increase among older households could reflect health investments. However, some of it might also come from increased investments in education of co-residing children, as suggested by Gutiérrez, Juárez and Rubli (2015).²⁷ The combined impact of the federal and state NC program positively affects saving in human capital for households whose oldest member is 60 to 64 years old, but the opposite holds for those age 65 to 69, and no other impacts are found for other age groups.

The federal NC program also increases saving in durable assets by households whose oldest member is 18 to 54 years old and households nearing the program's eligibility age by roughly 1 and 2 percentage points, respectively. In the case of younger households, the interaction of both programs has a negative effect on the investment in durable goods, but the effect is marginally significant. The effects of a state NC program by itself are all close to zero and statistically insignificant. The positive effects of the federal NC pension program on both human capital and durables investment found for households in the 18-54 and 65-69 might

²⁶ Investments in human capital, durable goods and housing are excluded from expenditures in the third definition used in Panel C of Table 5, so they are considered part of saving. Financial investment is excluded from all of our overall saving measures in Table 5.

²⁷ These authors find that the state NC pension program in DF has positive effects on the school enrollment of adolescent children who reside with potential beneficiaries.

explain why the effects on Table 5 in Panel C are smaller than those in Panel A. Indeed, as mentioned before, both categories are included as expenditures in the first saving definition but not in the third one. So, the decrease in monetary saving for these households reflects, in part, increased investment in human capital and durables.

Finally, state and federal NC programs appear to be associated with a 4 percentage point higher saving in real estate assets by households in the 65-69 age group, as well as with increases in financial saving of households in the 18-54 and 65-69 age groups of approximately 3 and 8 percentage points, respectively.

6.5.2 The Impact of Non-Contributory Programs on Labor Supply

To conclude, we also provide complementary evidence on a measure of household labor supply, a channel through which the impact of NC state-level programs might be taking place. To this end, Table 9 presents the estimated effect of federal and state NC pensions programs on the share of individuals age 16 and older in the household who are actually working. We include the same controls as in equation (1). In general, most of the effects of the federal NC pension program, and its interaction with the state-level one, are negative, but only three of them are statistically significant. The combination of state and federal NC pension programs has a negative impact on the labor supply of households whose oldest member is 65 to 69 years of age. For these households, the combined effect of both programs reaches -9.5 percentage points. This reduction could be due to an anticipation effect, but the literature so far has found no evidence of such an effect for individuals in their sixties (Juarez and Pfitze, 2013; Galiani, Gertler and Bando, 2012), so further analysis on who within these households is reducing her labor force participation seems due.

The federal NC pension program alone has a negative and significant effect on the share of working members in households in the 18-54 and 70 and older groups. The negative impact of 6.3 percentage points is in line with the reduction in labor force participation among beneficiaries found in some previous studies about the *70 y Más* program (Juarez and Pfitze, 2013). The effect for the younger group of households (-4 percentage points) has not been documented before. Previous studies find no effect on the labor supply of prime-age individuals who live with potential beneficiaries (Juarez and Pfitze, 2013; Galiani, Gertler and Bando, 2012). Note that, instead, our result in the first column in Table 9 refers to the share of working

individuals in households whose oldest member is age 18-54, i.e., those with no potential beneficiaries. Thus, our result for the youngest group is not directly comparable to previous studies and could be also due to the increase in income caused by the reduced need to transfer resources to the elderly.

Finally, to the extent that the groups experiencing a largest reduction in saving are those experiencing a reduction in their labor supply, the decrease in saving caused by NC pensions could be working in part through an associated reduction in labor supply.

7. Concluding Remarks

In this paper, we provide micro evidence on the effects of NC pension programs on the saving patterns of Mexican households. Our results show that the federal NC pension program by itself is associated with a reduction in the saving rate of households whose oldest member is either age 18 to 54 or 65 to 69 years old. The effect for both groups of households is quite robust across different saving definitions and identification and empirical checks. State NC programs by themselves have no significant effects in the saving rate of households in the smallest localities in Mexico, which were the first ones incorporated into the federal program, but we find some evidence of them reducing the saving of households with members in their sixties in larger localities. Finally, we find that, overall, the effects of the combination of the federal and state NC pension programs on the saving rate of households are mostly not statistically significant, which might be explained in part by each program having an effect on the saving of households in different population strata.

We find no significant impact of NC pension programs on the saving of households whose oldest member is age-eligible (70 and older), probably because the saving of these households is already low to begin with given their age.

The findings for households in the 65 to 69 group could reflect their expectation of receiving the transfer from the program in a few years. Younger households in the 18-59 age group—households that would be transferring private resources to their elderly in the absence of a NC program—might now be able to reduce their support. The previous evidence for Mexico, which shows a significant crowding-out effect of such programs on the transfers the elderly receive from other households (Juarez, 2009; Amuedo-Dorantes and Juarez, 2013) supports this explanation. In addition, these programs might reduce the longevity risk associated with their

elderly family members that do not qualify for a pension, thus also reducing their need for precautionary savings. In addition, we provide complementary evidence suggesting the reduction in saving is partly associated with reduction in labor supply for households in these two groups.

In sum, our findings suggest that NC pensions lowered the household saving of particular age groups during the first decade of their implementation, possibly through anticipation effects and a redistribution of income between households of different generations. These effects might become larger as these programs increase their pension amount and expand their coverage by decreasing the age eligibility cutoff. Finally, additional effects could be observed through other mechanisms and for other age groups as these programs become a more permanent component of the Mexican social insurance system.

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Table 1. Pensioners by Institution and Amount of the Pension, Mexico 2013

	Number of pensioners	Fraction by institution	Fraction by amount of the pension			
			1 MW or less	1-2 MW	More than 2 MW	NS
Total	4,346,973	1	0.16	0.38	0.26	0.2
By gender						
Men	2,511,518	0.58	0.13	0.41	0.25	0.2
Women	1,835,455	0.42	0.2	0.34	0.27	0.19
By institution						
IMSS	3,187,741	0.73	0.2	0.47	0.16	0.17
ISSSTE	780,748	0.18	0.03	0.17	0.58	0.22
Other	378,484	0.09	0.07	0.1	0.46	0.38

Source: These figures are taken from the 2013 Mexican Survey of Employment and Social Security (*Encuesta Nacional de Empleo y Seguridad Social 2013. ENESS. Tabulados básicos*. INEGI, available at www.inegi.org.mx).

Notes: “Other” refers to pensioners from PEMEX, ISSFAM, state-level social security institutes, other institutions of the public sector, private pension plans and pensioners that did not specify the institution.

Table 2. IMSS Contributors, Working-Age Individuals and Salaried Workers, Mexico 2013

	Population age 18-65 (1)	Salaried workers (2)	Salaried workers (w/o government) (3)	IMSS contributors (4)
Number of individuals	70,218,767	33,745,691	31,382,673	16,484,476
As a proportion of				
Population age 18-65	1	0.48	0.45	0.23
Salaried workers		1	0.93	0.49
Salaried workers (w/o government)			1	0.53
Source	CONAPO	ENOE	ENOE	IMSS

Source: Data from Mexican Occupation and Employment Survey if from the last quarter of 2013 (Encuesta Nacional de Ocupacion y Empleo, ENOE, INEGI, available at www.inegi.org.mx). The number of contributors comes from the official IMSS statistics.

Notes: The figures are from 2013 and the source of each is at the bottom of the table. Salaried workers without government employees in column 3 are calculated as total salaried workers (column 2) minus salaried workers in the services sector that belong to government and international organizations.

Table 3. Percentage of Transfers from 70 y Más by Income Decile, 2012

Decile	National	Urban	Rural
I	14.5	10.1	18.5
II	15.8	12.5	18.8
III	17	16.1	17.8
IV	11.6	9.6	13.5
V	9.3	13.1	5.9
VI	9.1	10.8	7.5
VII	9.2	11.8	6.8
VIII	6.8	7.9	5.7
IX	4.8	6	3.7
X	1.9	2.2	1.7
Total	100	100	100
Urban	47.4		
Rural	52.6		

Source: Secretaría de Hacienda y Crédito Público (2012), “Distribución del pago de impuestos y recepción del gasto público por deciles de hogares y personas. Resultados para el año 2012.”

Table 4. Means and Medians of Saving as a Proportion of Income

Year	2000	2002	2004	2006	2008	2010	2012
<i>Means</i>							
I-C monetary	-0.024	0.005	-0.125	-0.054	-0.362	-0.217	-0.171
I-C with inkind	-0.144	-0.076	-0.129	-0.288	-0.506	-0.301	-0.211
I-C monetary (C=nondurables)	0.12	0.134	0.024	0.098	-0.286	-0.134	-0.097
Human capital (health+education)	0.107	0.098	0.116	0.114	0.055	0.057	0.047
Durables	0.033	0.026	0.027	0.033	0.017	0.01	0.019
Housing	0.018	0.012	0.013	0.009	0.159	0.009	-0.002
Financial	0.009	0.001	0.021	0.034	0.035	0.017	-0.021
<i>Medians</i>							
I-C monetary	0.082	0.109	0.097	0.102	0.143	0.143	0.08
I-C with inkind	0.039	0.062	0.025	0.069	0.089	0.089	0.043
I-C monetary (C=nondurables)	0.193	0.211	0.216	0.223	0.203	0.203	0.135
Human capital (health+education)	0.046	0.034	0.042	0.043	0.01	0.01	0.005
Durables	0	0	0	0	0	0	0
Housing	0	0	0	0	0	0	0
Financial	0	0	0	0	0	0	0
Number of observations	10072	17121	22536	20822	29448	27524	8973

Source: ENIGH 2000-2012.

Notes: Saving is calculated as income minus consumption. Means are calculated using sampling weights.

Table 5. The Impact of Non-Contributory Pension Programs on Household Savings, Strata 1 and 4

By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
Panel A: Monetary Savings					
State & Federal Non-contributory Pension Programs	-0.020 (0.038)	-0.032 (0.050)	-0.070 (0.084)	0.142** (0.063)	0.025 (0.044)
Federal Non-contributory Pension Program	-0.044*** (0.013)	0.016 (0.037)	-0.013 (0.046)	-0.124*** (0.039)	-0.048 (0.029)
State Non-contributory Pension Program	-0.018 (0.013)	-0.025 (0.032)	-0.037* (0.020)	-0.040 (0.026)	-0.014 (0.026)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.045	0.058	0.068	0.062	0.053
Panel B: Savings including In-kind Savings					
State & Federal Non-contributory Pension Programs	-0.048 (0.086)	0.012 (0.096)	-0.385 (0.475)	0.069 (0.118)	0.085 (0.110)
Federal Non-contributory Pension Program	-0.040** (0.016)	0.014 (0.048)	0.566 (0.597)	-0.089* (0.050)	-0.067* (0.033)
State Non-contributory Pension Program	-0.048** (0.023)	-0.057 (0.055)	0.473 (0.541)	-0.078 (0.053)	-0.088 (0.052)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.042	0.041	0.006	0.050	0.029
Panel C: Monetary Savings including Non-durables in Consumption					
State & Federal Non-contributory Pension Programs	-0.017 (0.040)	-0.029 (0.043)	-0.046 (0.082)	0.091 (0.055)	0.003 (0.040)
Federal Non-contributory Pension Program	-0.019 (0.012)	0.034 (0.034)	-0.022 (0.043)	-0.081** (0.038)	-0.018 (0.024)
State Non-contributory Pension Program	-0.012 (0.014)	-0.023 (0.024)	-0.020 (0.017)	-0.044* (0.023)	-0.027 (0.025)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.065	0.073	0.087	0.076	0.064

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum 4, and post 2007, the relevant interactions, and a linear trend.

* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.

Table 6. Checks for Pre-Trends in the Impact of Non-contributory Pension Programs on Monetary Household Savings

By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
State & Federal Non-contributory Pension Programs	-0.036 (0.070)	-0.044 (0.087)	-0.273 (0.230)	0.167 (0.197)	0.035 (0.082)
Placebo State & Federal Non-contributory Pension Programs	0.026 (0.043)	-0.031 (0.083)	0.076 (0.083)	0.181 (0.174)	0.027 (0.084)
Federal Non-contributory Pension Program	-0.047** (0.020)	0.007 (0.064)	-0.019 (0.070)	-0.102* (0.054)	-0.024 (0.047)
Placebo Federal Non-contributory Pension Program	-0.003 (0.016)	0.007 (0.051)	-0.004 (0.065)	-0.037 (0.065)	-0.033 (0.047)
State Non-contributory Pension Program	-0.023 (0.018)	-0.019 (0.040)	-0.041 (0.028)	-0.022 (0.061)	0.004 (0.021)
Placebo State Non-contributory Pension Program	0.007 (0.014)	-0.042 (0.039)	0.024 (0.054)	-0.059 (0.059)	-0.061* (0.036)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.046	0.059	0.069	0.064	0.055

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum 4, and post 2007, the relevant interactions, and a linear trend.

* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.

Table 7. The Impact of Non-contributory Pension Programs on Household Savings, All Strata

By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
State & Federal Non-contributory Pension Programs	0.005 (0.023)	0.003 (0.040)	-0.039 (0.055)	0.063 (0.038)	0.036 (0.033)
Federal Non-contributory Pension Program	-0.027*** (0.008)	-0.003 (0.025)	-0.011 (0.029)	-0.094*** (0.024)	-0.043 (0.025)
State Non-contributory Pension Program	-0.016 (0.013)	-0.016 (0.030)	-0.046** (0.019)	-0.047* (0.023)	-0.020 (0.022)
Observations	78,309	9,791	8,628	6,970	15,961
R-squared	0.041	0.058	0.062	0.055	0.048

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum, and post 2007, the relevant interactions, and a linear trend.

* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.

**Table 8. The Impact of Non-contributory Pension Programs
on Different Components of Household Savings**

By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
Panel A: Human Capital Investments					
State & Federal Non-contributory Pension Programs	0.005 (0.007)	-0.003 (0.011)	0.034** (0.014)	-0.040** (0.019)	-0.020 (0.014)
Federal Non-contributory Pension Program	0.016*** (0.003)	0.019*** (0.006)	-0.010 (0.007)	0.025** (0.010)	0.024** (0.009)
State Non-contributory Pension Program	0.006 (0.004)	0.004 (0.008)	0.011 (0.008)	0.004 (0.010)	-0.006 (0.007)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.082	0.063	0.056	0.047	0.033
Panel B: Durables Investment					
State & Federal Non-contributory Pension Programs	-0.010* (0.006)	0.002 (0.010)	-0.017 (0.013)	-0.014 (0.009)	0.000 (0.007)
Federal Non-contributory Pension Program	0.012*** (0.002)	-0.001 (0.005)	0.006 (0.004)	0.021*** (0.007)	0.006 (0.004)
State Non-contributory Pension Program	0.000 (0.004)	-0.001 (0.009)	0.005 (0.006)	-0.001 (0.008)	-0.005 (0.005)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.014	0.020	0.018	0.021	0.015
Panel C: Real Estate Investment					
State & Federal Non-contributory Pension Programs	-0.023** (0.010)	-0.022 (0.016)	0.009 (0.019)	0.041** (0.019)	0.055 (0.036)
Federal Non-contributory Pension Program	0.007 (0.006)	0.007 (0.006)	-0.014 (0.015)	-0.015 (0.017)	-0.011 (0.014)
State Non-contributory Pension Program	0.001 (0.007)	0.001 (0.006)	-0.008 (0.006)	0.003 (0.011)	0.010 (0.009)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.001	0.008	0.013	0.013	0.004
Panel D: Financial Investment					
State & Federal Non-contributory Pension Programs	0.028*** (0.010)	-0.022 (0.031)	0.028 (0.029)	0.080* (0.040)	-0.032 (0.027)
Federal Non-contributory Pension Program	-0.011 (0.008)	-0.000 (0.018)	0.000 (0.016)	-0.059 (0.036)	-0.002 (0.010)
State Non-contributory Pension Program	0.001 (0.006)	0.020 (0.036)	-0.002 (0.014)	-0.000 (0.016)	-0.003 (0.013)
Observations	55,671	7,196	6,290	5,041	11,652
R-squared	0.009	0.017	0.024	0.020	0.016

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum 4, and post 2007, the relevant interactions, and a linear trend.

* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.

Table 9. The Impact of Non-contributory Pension Programs on the Share of Working-age Household Members at Work

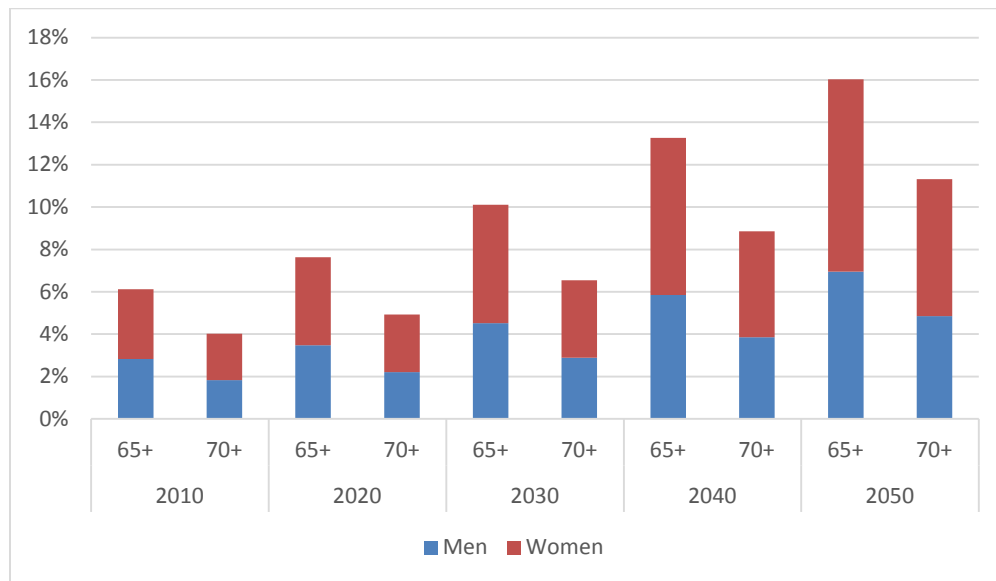
By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
State & Federal Non-contributory Pension Programs	-0.002 (0.026)	-0.043 (0.034)	-0.027 (0.065)	-0.095** (0.044)	-0.053 (0.056)
Federal Non-contributory Pension Program	-0.040** (0.017)	0.006 (0.020)	-0.041 (0.027)	-0.016 (0.025)	-0.063*** (0.016)
State Non-contributory Pension Program	0.009 (0.020)	-0.025 (0.022)	-0.010 (0.023)	0.037 (0.034)	-0.002 (0.030)
Observations	55,659	7,196	6,290	5,041	11,652
R-squared	0.029	0.047	0.048	0.060	0.134

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum 4, and post 2007, the relevant interactions, and a linear trend.

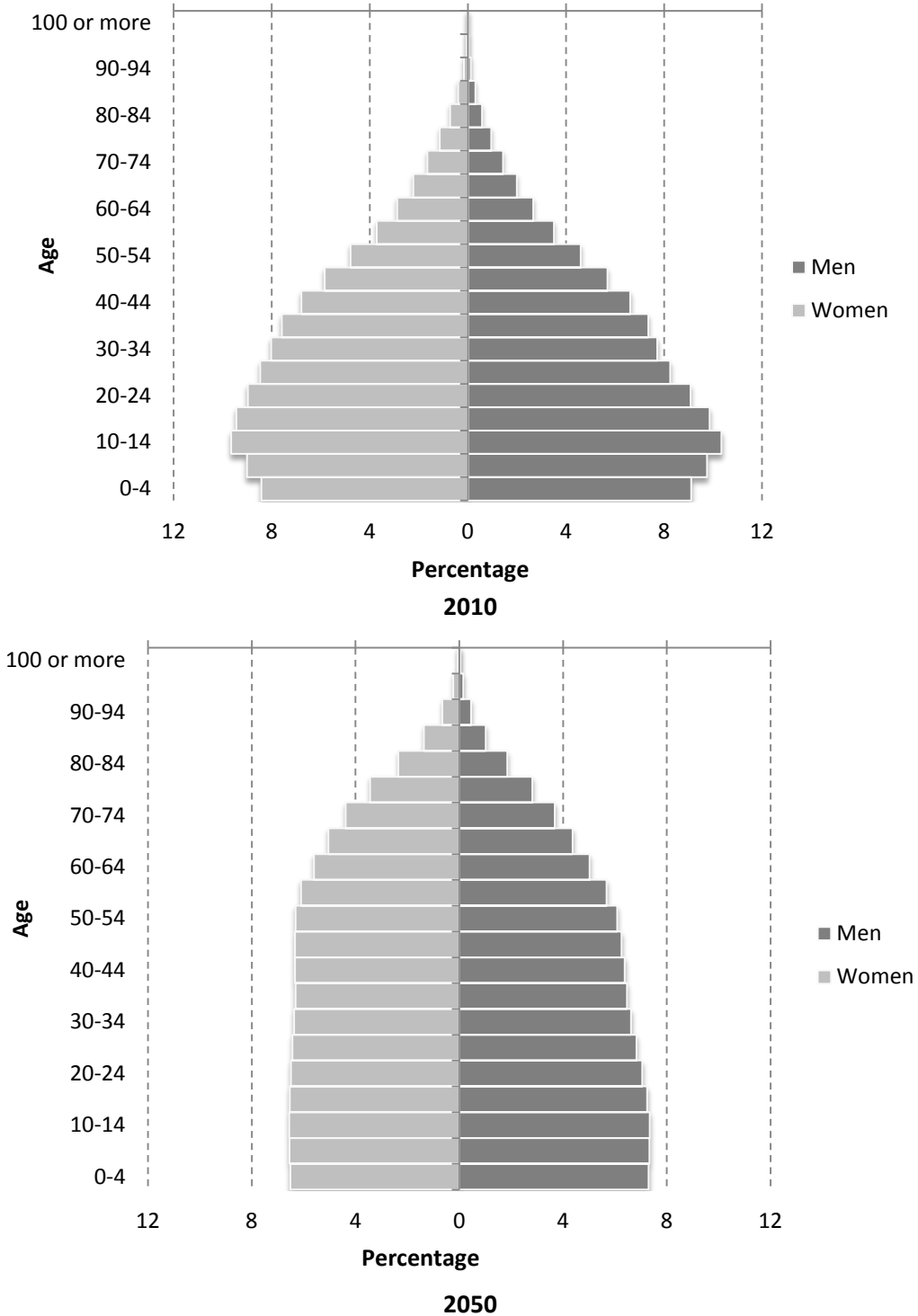
* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.

Figure 1. Percentage of the Mexican Population Age 65 and Older by Gender, 2010-2050



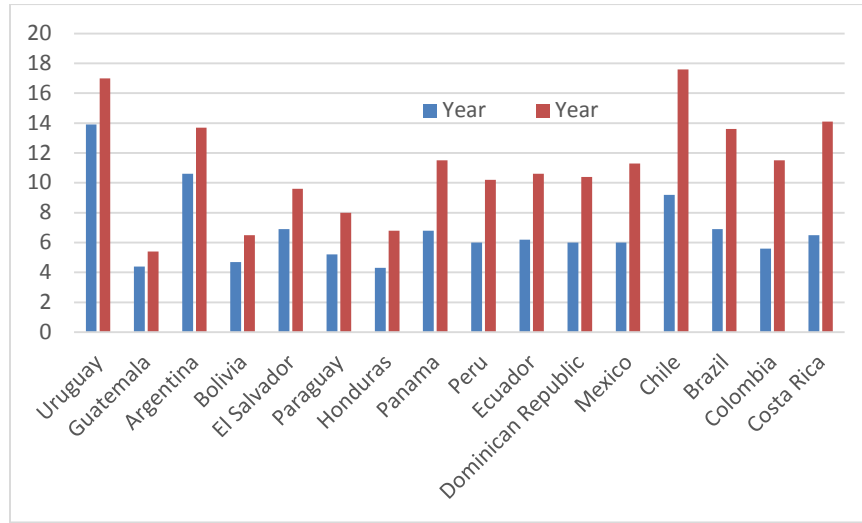
Source: Constructed by the authors based on the population projection of the Mexican Population Council (CONAPO).

Figure 2. Age Structure of the Mexican Population in 2010 and 2050



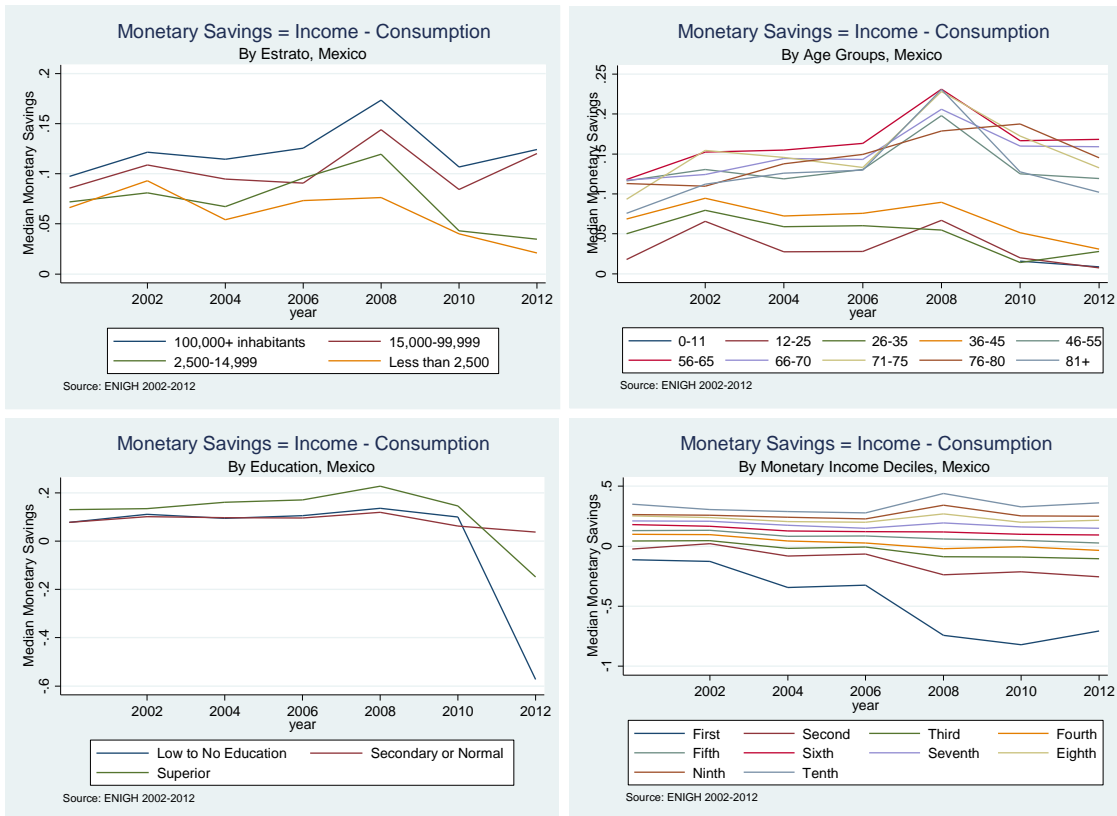
Source: Constructed by the authors based on the population projection of the Mexican Population Council (CONAPO).

Figure 3. Percentage of the Population Age 65 and Older in Selected Latin American Countries, 2010 and 2030



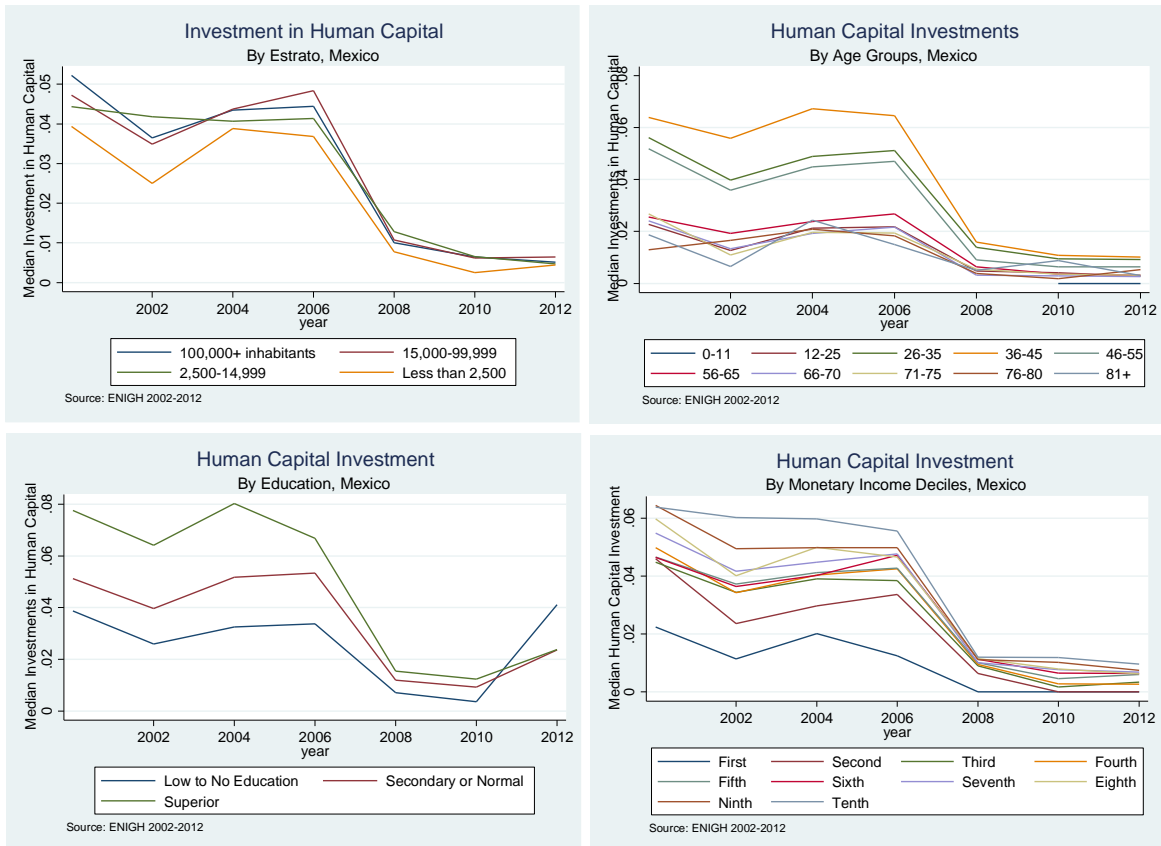
Notes: Constructed by the authors based on information from the Population Reference Bureau (www.prb.org). Countries are sorted according to the percent change in the population age 65 and older between 2010 and 2030.

Figures 4-7. Monetary Savings by Various Household Characteristics



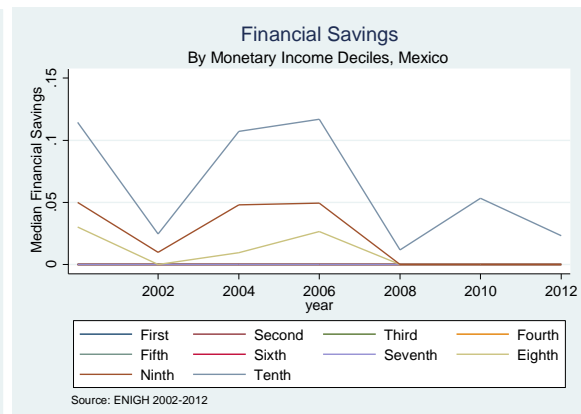
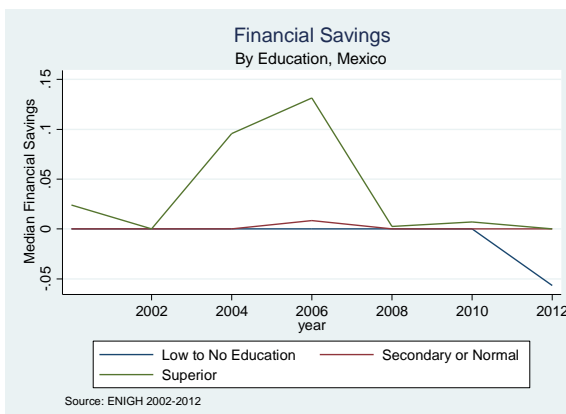
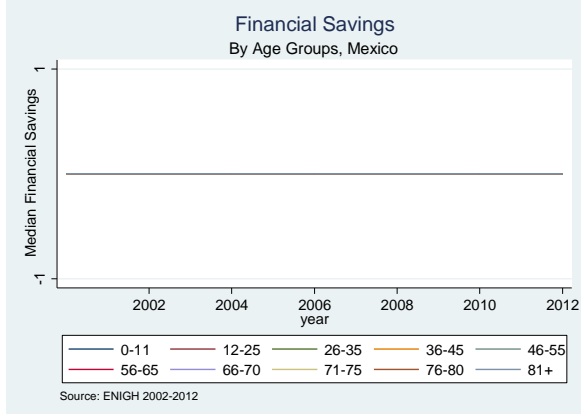
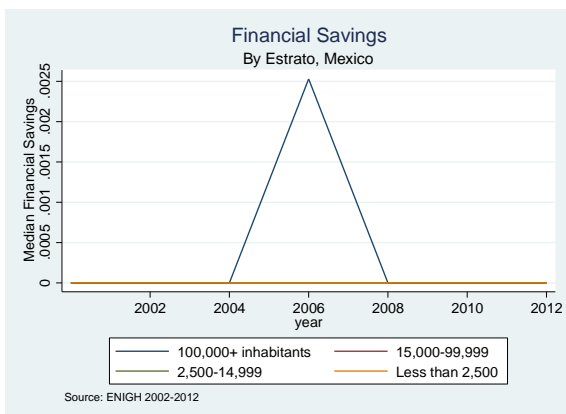
Source: ENIGH 2000-2012.

Figures 8-11. Human Capital Investments by Various Household Characteristics



Source: ENIGH 2000-2012.

Figures 12-15. Financial Savings by Various Household Characteristics



Source: ENIGH 2000-2012.

Appendix

Table A. Localities Eligible for the 70 y Más Program

Year	Eligible Localities in the Program	Eligible Localities in the ENIGH	Ineligible Localities in the ENIGH
2000-2006	None	None	All
2007	Localities < 2,500 inhabitants	---	---
2008	Localities < 20,000 inhabitants	Localities < 2,500; Localities 2500-14,999; Localities 15,000-99,000	Localities 100,000+
2009	Localities < 30,000 inhabitants	---	---
2010	Localities < 30,000 inhabitants	Localities < 2,500; Localities 2500-14,999; Localities 15,000-99,001	Localities 100,000+
2011	Localities < 30,000 inhabitants	---	---
2012	All localities	Localities < 2,500; Localities 2500-14,999; Localities 15,000-99,000; Localities 100,000+	None

Note: Column 2 shows the localities eligible for 70 y Más according to official program rules. Columns 3 and 4 show the eligible and ineligible groups of localities that can be identified in ENIGH in the rounds that are available.

Table B. States with NC Pension Programs 2000-2012

Year	Number of states with NC pensions	States starting NC pensions in that year
2000	None	None
2001		1 DF
2002		1 None
2003		1 None
2004		3 Chihuahua, Nuevo León
2005		4 Veracruz
2006		5 Quintana Roo
2007		9 Chiapas, Jalisco, Sinaloa, Yucatán
2008		11 Baja California Norte, Tabasco
2009		12 Tabasco
2010		13 Durango
2011		14 Zacatecas
2012		14 None

Source: Constructed by the authors based on the information of Table A.1. in Aguila et al. (2011).

**Table C. The Impact of Non-contributory Pension Programs on Household Savings,
All Strata, Different Effects by Strata**

By Age of Oldest Household Member	18-54	55-59	60-64	65-69	70+
State & Federal Non-contributory Pension Programs Stratum 4	-0.024 (0.036)	-0.001 (0.047)	-0.074 (0.085)	0.145** (0.060)	0.038 (0.042)
State & Federal Non-contributory Pension Programs Stratum 3	0.033 (0.026)	-0.079 (0.081)	0.049 (0.093)	-0.033 (0.121)	0.145*** (0.045)
State & Federal Non-contributory Pension Programs Stratum 2	0.006 (0.029)	0.063 (0.053)	-0.059 (0.058)	-0.053 (0.079)	-0.057 (0.052)
Federal Non-contributory Pension Programs Stratum 4	-0.036*** (0.013)	-0.002 (0.036)	-0.016 (0.043)	-0.129*** (0.029)	-0.048 (0.034)
Federal Non-contributory Pension Programs Stratum 3	-0.018 (0.023)	0.056 (0.049)	-0.038 (0.069)	-0.038 (0.050)	-0.065 (0.039)
Federal Non-contributory Pension Programs Stratum 2	-0.006 (0.013)	-0.046 (0.032)	0.022 (0.031)	-0.016 (0.058)	-0.001 (0.034)
State Non-contributory Pension Program	-0.019 (0.013)	-0.016 (0.031)	-0.048** (0.019)	-0.046* (0.023)	-0.020 (0.023)
State Non-contributory Pension Programs x Stratum 2	0.006 (0.011)	0.013 (0.036)	0.066 (0.045)	0.061 (0.046)	0.041 (0.027)
State Non-contributory Pension Programs x Stratum 3	-0.025 (0.019)	0.074 (0.052)	-0.055 (0.050)	-0.005 (0.080)	-0.044 (0.037)
State Non-contributory Pension Programs x Stratum 4	0.026 (0.025)	0.049 (0.031)	0.044 (0.058)	-0.059 (0.056)	0.012 (0.037)
Observations	78,309	9,791	8,628	6,970	15,961
R-squared	0.041	0.058	0.063	0.055	0.048

Source: ENIGH 2000-2012.

Notes: Standard errors clustered at the state level are in parentheses. All regressions include a constant term along with household level characteristics (a dummy for female head, age and education of the household head, share of household members in different age and education group), dummies for state, stratum, the relevant interactions, and a linear trend.

* Coefficient is statistically significant at the 10 percent level; ** at the 5 percent level; *** at the 1 percent level; no asterisk means the coefficient is not different from zero with a statistical significance.