Reduction in Minimum Age Eligibility for Social Pensions and Household Poverty: Evidence from Mexico*

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Abstract

This paper examines the impact of social pensions on old-age poverty in Mexico. To achieve causal identification, we leverage the expansion of Mexico's flagship, non-means-tested social pension program in 2013. We find that the program's expansion significantly reduced extreme poverty, mainly among indigenous seniors and in rural areas. However, the expansion had negligible effects in urban contexts and on other well-being dimensions, including labor force participation and health outcomes. This suggests that social pensions were not effective in simultaneously ensuring minimum economic well-being and inducing retirement. The program's mistargeting and small cash transfer are among the main explanations.

Keywords: Elderly, non-contributory pensions, poverty
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Introduction

In 2019, unprecedented, anti-government, mass protests erupted in Latin America. Although each mobilization was sparked by different factors, all shared a common thread: long-standing inequality and socioeconomic immobility. From Chile and Ecuador to Colombia, young protesters had specific demands, but one stood out across countries: an overhaul of the pension system and better social protection for the elderly (Reid, 2019; Gonzalez and Morán, 2020; Shifter, 2020). The demand for better pensions by people far from retirement age confirms the ineffectiveness of the region's contributory pension systems, which have increasingly left seniors in precarious living conditions. These demonstrations motivated debates about what policies could achieve a more socially just region. Among the main suggested instruments was the expansion of social (non-contributory) pension programs.

The accelerated pace of population ageing, rising life expectancy, and high poverty rates among the elderly also support the view of expanding social pensions, especially in countries with limited social security coverage (Barrientos, 2006). The conventional view is that non-contributory pension schemes can influence retirement and reduce labor supply among the elderly, with effects varying by gender (Juarez and Pfutze, 2015; Posel, Fairburn and Lund, 2006).[1] Previous literature shows that such schemes can also have a positive impact on consumption (Case and Deaton, 1998), food security (Aguila, Kapteyn and Perez-Arce, 2017; Juarez and Pfutze, 2020), health (Bando, Galiani and Gertler, 2016; Huang and Zhang, 2021), and subjective well-being (Bando, Galiani and Gertler, 2020). In addition, several studies find that social pensions may affect human capital investments, health outcomes, and labor supply patterns of other household members, including prime-age adults (Ardington, Case and Hosegood, 2009; Bertrand, Mullainathan and Miller, 2003), adolescents (Edmonds, 2006; Juarez and Pfutze, 2015), and children (Duflo, 2003). The existing research, however, pertains to evaluations of social pension programs implemented for the first time and mostly in rural and semi-rural areas.[2] Therefore, we count with little evidence about the effectiveness of expanding existing programs to urban contexts or younger age cohorts. To our knowledge, the Brazilian social security reform of 1991, which reduced the minimum eligibility age for social pensions, is the only policy change that has been examined. De Carvalho Filho (2008) finds that such reform increased the probability of retirement and reduced the labor supply of rural workers.

[1] Reductions in labor supply usually refer to paid work (formal employment). Bando, Galiani and Gertler (2016) find that beneficiaries reduced their participation in paid work in favor of unpaid work within the household or family businesses.

[2] See Leisering (2009) and Dethier, Pestieau and Ali (2010) for surveys on non-contributory pension programs in developing countries and in Latin America, respectively. Viet Nguyen (2021) is one of the few studies that examine the effects of social pensions in urban contexts.

In this paper, we examine the expansion of Mexico's non-contributory pension program: *Programa de Adultos Mayores* (PAM). This program is one of the main social protection instruments in the country, with a budget of 17.6 billion pesos, about 0.16% of Mexico's GDP, and 5.1 million beneficiaries in 2017. From 2007-2012, seniors of at least 70 years old were eligible for PAM and received a cash transfer of 500 Mexican pesos (40 US dollars) aiming to improve the living conditions of the elderly, prevent old-age poverty, and close the coverage gap of the pension system.[3] In 2013, the minimum-age requirement to be eligible for the program was reduced from 70 to 65 years old. We exploit this change in the program's eligibility rules to estimate the impact of expanding social pensions on a set of outcome variables capturing the well-being of the elderly: (extreme) poverty, health, labor force participation, and labor supply. Our findings contribute to the literature on social pensions in four aspects. First, we provide causal evidence of the impact of social pensions on poverty, which has been overlooked by previous studies, as eligibility to some social pensions programs is based on means tests—a criterion that mechanically reduces poverty (see, for example, Case and Deaton (1998); Pal and Palacios (2011); Bando, Galiani and Gertler (2021). For programs that do not use means tests, however, the effect on poverty reduction is ambiguous, as the cash transfer may not be enough to lift the elderly out of poverty and/or the program may benefit individuals who are already above the poverty threshold (mistargeting). Second, we study seniors at early stages of old age, whose response to income shocks may not be the same as in later stages (Kolsrud et al., 2021). Third, our results provide evidence on the impact of PAM in urban Mexico, where the dynamics of poverty are likely to differ from those in rural areas (Amato and Zuo, 1992; Ravallion, 2002).[4] Fourth, we present results for indigenous seniors, who are arguably among the most vulnerable population in Mexico. Furthermore, decisions on labor supply and retirement may also be influenced by cultural and social norms that vary with ethnicity (Blanco et al., 2017; Lopez-Calva and Patrinos, 2015). To our knowledge, the recent work of Juarez and Rodriguez Piña (2021) is the only one examining how social pensions impact the well-being of indigenous people.

To identify the effect of the program's expansion, we use the 2008-2014 rounds of Mexico's National Household Income and Expenditure Survey (ENIGH) and implement a difference-in-differences (DD) strategy. Our treatment group are individuals aged 66-69, who became eligible to the program and did not receive a contributory pension. Individuals aged 61-64, who were not affected by the policy change, are our comparison group. We find that the expansion of PAM reduced the probability of living in extreme

[3] We use the average monthly exchange rate in 2013: 12.5 MXN per 1 USD.

[4] Previous research examining the effects of PAM refer to rural areas only, as the program had geographic eligibility requirements before 2012. See, for example, Aguila, Kapteyn and Perez-Arce (2017); Amuedo-Dorantes, Juarez and Alonso (2019); Bando, Galiani and Gertler (2016); Juarez (2010); Juarez and Pfutze (2015, 2020).

poverty but had no effect on poverty. This is particularly worrisome as the poverty line that we use captures the cost of basic goods (personal hygiene and clothing) and services (transportation) that besides the basic food basket, captured by the extreme poverty line, are necessary for the well-being of the elderly population. We also find that the program had no effect on the senior's labor force participation, labor supply, or health, which contrasts with previous research studying older adults aged 70 and older in Mexico. Together these findings suggest that the expansion was unable to guarantee a good life quality and simultaneously induce retirement. Our results are robust to using control and treatment groups closer to the minimum eligibility age and to using an alternative control group. Likewise, our event-study results confirm the absence of preexisting differences in poverty and labor supply trends between the treatment and control group. We also do not find evidence of anticipation effects associated with PAM's expansion when assessing the labor supply responses of non-eligible seniors aged 63-64.

The effects of the expansion varied substantially across population groups (men, women, and indigenous people) and social contexts (rural and urban). First, our results show that the effect on extreme poverty was substantially larger for indigenous seniors than for non-indigenous seniors: 21 v. 3 percentage points reduction, respectively. Second, the intervention induced the substitution of paid work for unpaid work but only among men. Unpaid work usually takes place in small family businesses (bicycle taxi, family farms, food stands, and the like) that may demand the participation of the beneficiary particularly during early stages of old age. This effect, however, was not accompanied by a reduction in the number of hours worked, implying that the expansion of PAM only changed the labor supply composition, with eligible-for-treatment men moving to less stressful and less demanding informal unpaid work.[5] In terms of spillover effects, we find that girls aged 11-17 co-residing with the beneficiary increased their labor supply by 2.7 hours, which may suggest that investments in family businesses demanded the participation of girls in chores associated to these ventures. Third, while the program's expansion was effective in reaching the poorest seniors in rural areas, it was less so in both suburban areas and cities. We find that the intervention had no effect on poverty or extreme poverty in these areas, suggesting that the expansion was mistargeted. This may be due to the fact that the poor tend to live in places of extreme policy neglect: informal settlements (slums) or marginal lands (steep hillsides) in suburban areas and cities (Marx, Stoker and Suri, 2013). Generally these areas are difficult to access and thus for promoting enrollment to social programs. We provide evidence showing that the program's take-up was particularly low in these areas.

[5] Similar results have previously been found for both rural Mexico (Bando, Galiani and Gertler, 2016) and Peru (Bando, Galiani and Gertler, 2020).

An interesting feature of our data source is that we can observe PAM beneficiaries, which allows us estimate the treatment-on-the-treated effect. However, the program was not randomly assigned, as the Mexican government selected localities with high poverty rates to promote enrollment into the program. We overcome this selection problem by implementing an instrumental variables (IV) strategy, where we instrument the endogenous variable—be a PAM beneficiary—with the exogenous variation in the eligibility age produced by the intervention. The results are in line with our DD estimates. Among treated individuals, the expansion of PAM was only successful in reducing the probability of living in extreme poverty. This effect was larger for the most vulnerable, with indigenous people experiencing a 42 percentage points reduction. We also observe a 21 percentage point reduction for treated individuals living in rural communities.

The remainder of the paper is organized as follows. Next, we introduce the main characteristics of the program. In section 3 we describe the strategy that allows us to identify the causal effects of PAM's expansion. In section 2 we introduce the characteristics and caveats of our data source. We present the empirical results in section 4 and conclude in section 5.

1. Background

In the last century, pension systems worldwide were mainly contributory plans with a minimum eligibility requirement of hours or weeks worked. In many countries, these pension schemes left out people that did not work or did not work "enough" in formal jobs. The financial sustainability of such systems also became questionable in the 1980s and 1990s due to demographic changes: accelerated population ageing and rising life expectancy. While governments undertook wide-ranging reforms to improve contributory pension schemes, issues such as pension coverage were often left out of discussion (Aguila, 2011; Rofman, Apella and Vezza, 2015). In Mexico, for example, only 35% of the economically active population contributed to the pension system and about 37% of the population older than 65 years received a contributory pension in 2010 (Villagómez and Ramírez, 2015).[6] Another issue of contributory schemes is that their coverage tends to be biased towards the high-income population, accentuating poverty among the elderly.[7] To deal with these limitations, policymakers promoted the implementation of non-contributory (social) pension schemes.[8] In addition to reducing the coverage gap, social pensions

[6] The coverage of the Mexican contributory pension system is lower than in countries such as Argentina, Brazil, and Chile.
[7] Since contributory schemes are based on formal work history, they tend to exclude the poor who usually work in informal jobs during their lifetime.
[8] While social pensions have existed for decades, it was not until the beginning of the twenty-first century that they gained momentum.

became a popular instrument to tackle poverty in old-age; provide social protection to a population group facing higher vulnerability to sickness and disability; and guarantee retirement with an adequate pension (Holzmann and Robalino, 2009).

1.1 The Program

In 2007, Mexico's Ministry of Social Development introduced a non-contributory pension program called *Programa de Adultos Mayores* (PAM) targeting adults of 70 years of age or older who lived in rural villages—localities with less than 2,500 inhabitants.[9] PAM provided a cash transfer of 1,000 Mexican pesos (91 US dollars) every two months, aiming to close the coverage gap of the pension system, improve the living conditions of the elderly, and prevent old-age poverty. The program executed 6 billion pesos—about 0.05% of GDP—in its first year of operation and had 1.03 million beneficiaries. Since then, PAM has been growing to date in terms of budget and number of beneficiaries, becoming the flagship program of Mexico's social protection policy. In 2008, changes were made to indicate that while priority was still given to rural villages, the program could extend its coverage to other villages of up to 10,000 inhabitants and, if budget allowed, the program could expand to villages of up to 20,000 inhabitants prioritizing poor villages. In 2009, the program expanded its coverage to villages of up to 30,000 inhabitants, and in 2012 the roll-out of the program expanded to all villages (see Amuedo-Dorantes, Juarez and Alonso, 2019, Table A2). From 2007 to 2012, the benefit level of PAM was maintained at 500 Mexican pesos per month, or about 50% of beneficiaries' monthly per capita income.[10]

1.2 The Expansion of PAM

On December 1, 2012, Enrique Peña Nieto took office as President of Mexico and announced that he would expand PAM. Three months later, in February 2013, the qualifying age to be eligible for PAM was reduced to include individuals aged 65 and over, and the program's cash transfer was increased to 580 Mexican pesos per month. This change to the eligibility rules represented an important expansion of the program's coverage. The new eligibility criteria, which was relatively easy to verify, and the existing operating capacity of PAM, which covered all 32 states of Mexico, facilitated the rapid expansion of the program. According to Mexico's Household Income and Expenditure Survey (ENIGH), in 2014, there were already 1.1 million (self-reported) PAM beneficiaries between 65 and 69 years of age.[11] The rapid

[9] The program was also known as *70 y Más*.

[10] In 2010, the program added a lump-sum payment of 1,000 Mexican pesos to be paid to a representative of the beneficiary in the case of death.

[11] According to the beneficiary records, there was no one below 70 years old receiving PAM at the beginning of 2013. Four months after the new eligibility rules were announced, there were over half a million beneficiaries between 65 and 69 years

implementation of the expansion is relevant to our analysis, as it allows us to assume that systemic drivers affecting the economic well-being and labor supply of the elderly population did not change during the expansion. The short period of time between the announcement and the formalization of the expansion also minimizes the likelihood of capturing potential income or labor supply adjustments in anticipation of the program's expansion.[12] As part of our analysis, we will provide evidence supporting the absence of anticipation effects.

2. Data

The data for our empirical analysis come from the Socioeconomic Conditions Module (MCS) of the ENIGH. In particular, we use the 2008, 2010, 2012, and 2014 rounds to construct a pooled cross-section data set. The survey collects rich socioeconomic data for a sample of households representative at the national, state, and urban-rural level. It reports detailed information on income sources for each household member, including contributory pensions or retirement payments, and cash transfers from PAM and other non-contributory pension programs. This allows us to identify the elderly who received any kind of contributory pensions and exclude them from the analysis.

2.1 Outcome Variables

We examine the impact of PAM's expansion on four outcome variables that capture the quality of life of the elderly: incidence of (extreme) poverty, labor force participation, and labor supply. We use per capita household income (hereinafter referred to as income) and Mexico's official monetary poverty lines to identify the elderly living in (extreme) poverty (CONEVAL, 2014). Income is the total monetary (wages, income from independent work, and nonworking income such as dividends, rents, or money transfers) and non-monetary (the value of gifts, payments, and transfers in kind) income of the household divided by the household size—the number of adult-equivalent household members. The extreme poverty line is the monetary value of the basic food basket, which represents the minimum recommended nutritional intake for the average Mexican. The poverty line is the sum of the monetary value of the food and non-food baskets. The latter comprises basic necessary goods and services such as personal hygiene, clothing, transportation, among others. Note that the value of each basket is estimated for urban and

of age. Before the end of 2014, there were more than 1.5 million beneficiaries belonging to this age cohort, representing one third of Mexico's population between 65 and 69 years of age. Differences in the number of beneficiaries between the program's records and the ENIGH are due to the usual under reporting of income and income sources in household surveys.

[12] We acknowledge that the expansion of PAM was part of Peña Nieto's presidential campaign and thus some seniors could have anticipated the expansion of the program. However, the campaign proposal did not mention any specifics about when the expansion would take place or which would be the eligibility criteria.

rural areas to consider differences in social contexts (Hernandez Licona, 2016). With these data we construct two dummy variables: *Poverty* (1 = income below the poverty line, 0 = otherwise) and *Extreme Poverty* (1 = income below the extreme poverty line, 0 = otherwise). *Labor Force Participation* is a dummy variable equal to one if the individual is employed or unemployed but actively seeking for a job, and zero otherwise. We construct this variable based on answers to the questions, "Did you work last month?" (1 = yes, 0 = no) and "Did you search for a job last month?" (1 = yes, 0 = no). *Labor Supply* is the number of hours worked by the individual in the week prior to the interview. This variable takes the value of zero for unemployed or retired individuals.

2.2 Control Variables

We use a set of individual-level control variables, including sex, years of formal education, indigenous status, and cohabitation status. *Indigenous* is a dummy variable equal to one if the individual reported to speak an indigenous language, and zero otherwise. *Cohabitation* denotes a dummy variable equal to one if the individual lived in a household with one or more PAM beneficiaries. We also use indicators for age, size of locality of residence (up to 1,499 inhabitants; 2,500 to 14,999 inhabitants; 15,000 to 99,999 inhabitants; and over 100,000 inhabitants), and state of residence.

2.3 Descriptive Statistics

In Figure 1 we plot the pensions coverage gap in Mexico. It is clear that PAM has helped to close the pension coverage gap, but has done so most notably in the lower income deciles. Despite significant progress, the coverage gap remains substantial, which is particularly worrisome for the population at the bottom of the income distribution. Even in top-income deciles the coverage is under 60%. It is worth mentioning that some state governments have implemented their own social pension programs to secure the well-being of their elderly population. However, many of these programs are very limited in the number of beneficiaries and/or amount of the cash transfer offered. Perhaps the only exceptions are the programs in Mexico City and the state of Chiapas.

In Table 1 we compare the socioeconomic profile of the control and treatment groups before and after the expansion of PAM. The treatment group consists of individuals aged 66-69 years, who became eligible for the program as a result of the expansion. The comparison group consists of non-eligible individuals aged 61-64 years, whose observed pre-intervention characteristics are very similar to those of the treatment group. Note that although individuals of 65 years of age were eligible for treatment when

surveyed in 2014, we do not know exactly when they became eligible. These individuals may not have had enough exposure to the eligibility-for-treatment and thus we exclude them from the analysis. Panel A shows that per capita income of both groups increased from 2012 to 2014, but it increased more for eligible-for-treatment individuals. The difference-in-differences estimate shows that despite having a lower per capita income in 2012, the treatment group had an income 10 percent higher than that of the comparison group after the intervention. The treatment group also had a smaller proportion of individuals living in extreme poverty after the intervention: four percentage points less than that of the non-eligible individuals. However, we find no statistically significant differences in any other outcome variable. These preliminary results suggest that having access to PAM represented a significant income shock but its impact was limited to the poorest population.

In panel B we present difference-in-differences estimates for our control variables, which could have influence changes in the well-being of the elderly. We find no statistically significant differences across groups in terms of years of education, proportion of indigenous people, or proportion of households with PAM beneficiaries (cohabitation). We do find, however, a five percentage points increase in the proportion of females. Overall, the descriptive statistics suggest that both groups are comparable, as they have very similar observable characteristics.

3. Identification Strategy

Our identification strategy consists of difference-in-differences (DD) and instrumental variables (IV) designs that estimate, respectively, the intention-to-treat (ITT) and local-average-treatment (LATE) effects associated with the program's expansion.

3.1 Difference-in-Differences

To evaluate the effect of becoming eligible for the program, we use a DD design that exploits the reduction in PAM's minimum age eligibility requirement. This intervention allows us to estimate differences in outcomes between the treatment and control groups. Note that the treatment group includes individuals who were not necessarily beneficiaries and thus this approach estimates the ITT effect of the program's expansion. Our DD estimating equation is as follows:

$$y_{iat} = \alpha + \beta\,(treatment_a \times after_t) + \delta\, after_t + \gamma_a + \boldsymbol{X_{iat}\lambda} + \varepsilon_{iat}. \tag{1}$$

Where y_{iat} is the outcome for individual i; $treatment_a$ is a dummy variable indicating whether the individual belongs to the treatment group; $after_t$ is a dummy variable indicating whether the individual is observed after the intervention; and γ_a is a full set of age-group fixed effects that control for any time-invariant, age-specific characteristics. The coefficient of interest, β, is the difference-in-differences estimator that captures the effect of the intervention for individuals in the eligible-for-treatment group. $\boldsymbol{X_{iat}}$ is a vector of control variables defined previously (sex, education, indigenous status, cohabitation status, locality of residence, and state of residence). In all specifications we cluster the standard errors at the municipality level, as the sample was first selected at this geographic unit (Abadie et al., 2017).[13]

The identifying assumption in our model is that in the absence of the program's expansion, differences in outcomes between the comparison and treatment group should be constant over time. We provide evidence on this assumption by estimating the following (event study) equation:

$$y_{iat} = \alpha + \sum_t \beta_t I_{(treatment_{at}=t)} + \gamma_a + \tau_t + \boldsymbol{X_{iat}}\boldsymbol{\lambda} + \varepsilon_{iat}. \tag{2}$$

Where $I_{(treatment_{at}=t)}$ is an indicator function with $t = \{2008, 2010, 2014\}$, and τ_t is a full set of time fixed effects. The coefficient β_t can be interpreted as the difference in outcomes between the treatment and comparison group relative to the difference in outcomes in the omitted year, 2012. In this sense, non-statistically significant β_t coefficients for the pre-intervention period, $t = \{2008, 2010\}$, would provide evidence supporting the parallel trend assumption.

3.2 Instrumental Variables Strategy

One feature of our data source is that it identifies the program's beneficiaries, allowing us to gauge the effect of receiving a social pension. We could estimate the effect of PAM on the treated population as follows:

$$y_{iat} = \phi_0 + \phi_1 PAM_{iat} + \phi_2 after_t + \gamma_a + \boldsymbol{X_{iat}}\boldsymbol{\psi} + v_{iat}. \tag{3}$$

Where PAM_{iat} is a dummy variable indicating whether the individual is a beneficiary of PAM. However, as part of the program's expansion, the Mexican government promoted and prioritized the enrollment in localities with high poverty and high social rights deprivation rates. This targeting strategy raises concerns about the potential endogeneity of the program's enrollment. To account for this issue, we

[13]The MCS-ENIGH follows a multi-stage cluster sampling design, where localities (villages) are first randomly selected. According to Mexico's National Institute of Statistics and Geography (INEGI) these primary sampling units can be best described as municipalities. Next, a number of households are randomly selected from each primary sampling unit.

use the interaction between the individual's eligibility status and the timing of the policy intervention $(treatment_a \times after_t)$ as an instrument for the condition of being beneficiary of the program (PAM_{iat}). Although the exclusion restriction cannot be tested empirically, we argue that the instrument does not directly affect poverty other than through PAM because the individuals' eligibility to the program is not directly related to their well-being outcomes. The first-stage (Equation 4) and second-stage (Equation 5) regression equations of our IV strategy are the following:

$$PAM_{iat} = \pi_0 + \pi_1 (treatment_a \times after_t) + \pi_2 after_t + \gamma_a + \boldsymbol{X_{iat}}\boldsymbol{\omega} + u_{iat} \tag{4}$$

$$y_{iat} = \psi_0 + \psi_1 \widehat{PAM}_{iat} + \psi_2 after_t + \gamma_a + \boldsymbol{X_{iat}}\boldsymbol{\theta} + \epsilon_{iat}. \tag{5}$$

As part of the results, we will present the first-stage F-statistics, which exceed the rule of thumb cutoff, confirming that the instrument relevance condition is satisfied (Bound, Jaeger and Baker, 1995). Note that the IV estimator (ψ_1) captures the treatment effect for compliers near the eligibility threshold: individuals 66-69 years old who were beneficiaries of PAM. Therefore, the estimates of our IV strategy capture the local-average-treatment effect (LATE) associated to the program.

4. Results

4.1 Intention-to-Treat Effect

In Figure 2 we provide suggestive evidence on the parallel trend assumption underlying our difference-in-differences design. Panels A to E show that estimates for both 2008 and 2010 are mostly not statistically different from zero, indicating that differences in outcomes between the control and treatment group were constant over time before the intervention. In contrast, estimates for 2014 are statistically significant but only for income and extreme poverty outcomes (see panels A and B). This first analysis suggests that the expansion may not have impacted health or labor outcomes of the elderly. In panel A of Table 2 we present the main results of our study: the intention-to-treat effect (ITT) of PAM's expansion. Column 2 shows that PAM increased the per capita income of the eligible-for-treatment group by 13 percent, suggesting that the expansion of the program did not significantly crowd out other income sources such as labor or remittances. An increase in income, however, does not necessary imply that the intervention reduced (extreme) poverty among the new eligible population. If the cash transfer was not enough to lift the elderly out of poverty and/or the program benefited individuals who were already above the poverty threshold (mistargeting), the expansion could have had limited effects on poverty reduction. Column 3

shows that PAM's expansion did not affect the probability of living in poverty. Although the effect is negative, the point estimate is relatively small and statistically insignificant. Column 4, on the contrary, shows that PAM's expansion reduced extreme poverty by 5 percentage points for the average senior in the new eligible group. As the extreme poverty threshold captures the cost of the official food basket, this finding aligns with recent research showing that, before the program's expansion in 2013, PAM reduced the share of seniors that had only one meal a day due to lack of economic resources (Juarez and Pfutze, 2020).

The small value of the program's cash transfer questions whether the intervention could have affected retirement and/or labor supply patterns and simultaneously induce the observed effect on extreme poverty. Estimates in columns 5 show that the expansion of PAM had small and statistically insignificant effects on labor force participation. This finding contrasts with previous literature arguing that PAM significantly increased retirement among seniors of 70 years old and over (Bando, Galiani and Gertler, 2016; Juarez and Pfutze, 2015). Interestingly, we find small, positive but statistically insignificant effects on labor supply. These findings suggest that the labor-leisure preferences of seniors may vary across age-cohorts, with individuals in early stages of old-age using social pensions as a mechanism to remain in the labor force and/or increase their labor supply. Pfutze and Rodríguez-Castelán (2019) show that this was the case among Colombian old-age adults younger than 70 years.

In terms of health outcomes, we do not find any statistically significant impact on self-reported sickness. The point estimate, however, suggests a potential reduction in the proportion of individuals experiencing sickness in the past 12 months (see column 7 of Table 2). This result is in line with Bando, Galiani and Gertler (2020), who argue that social pensions in Peru did not affect physical health outcomes or the use of health services. However, our finding is at odds with previous literature arguing that social pensions in the state of Yucatan, Mexico improved self-reported health (Aguila, Kapteyn and Smith, 2015; Aguila, Kapteyn and Perez-Arce, 2017). Note that the findings of these studies are for individuals of 70 years of age or older living in urban areas: a population group with a higher propensity to experience sickness and who live in localities where health services are usually easily accessible. One explanation for our results is that we observe new eligible individuals one year after the intervention, which may not be enough time for experiencing a significant improvement in physical health. In addition to the cash transfer, PAM beneficiaries are entitled to regular health checkups at local health centers. This complimentary benefit aims to detect, mitigate, and prevent conditions that commonly affect the elderly population: diabetes, arthritis, osteoporosis, etc. Our estimates in column 8, however, suggest that the program's

expansion had small and statistically insignificant effects. Two factors may explain this result. First, accessing health centers may imply considerable transportation costs, specially in rural areas. Second, the population may not be aware of the benefits of regular health checkups in the absence of sickness. This zero-effect is consistent with the findings of Bando, Galiani and Gertler (2021), who show that Paraguay's social pensions program, targeting older adults living in poverty, did not impact the use of health services.

4.1.1 Robustness tests

During old age health can deteriorate rapidly, increasing the individual's vulnerability to poverty. One potential caveat to our results is that the treatment and control groups may not be comparable, as the youngest individuals in our control group are about 7 to 8 years younger than the oldest individuals in the eligible-for-treatment group. In Panel B of Table 2 we present results using comparison (63-64 years old) and treatment (66-67 years old) groups closer to the minimum eligibility age. The estimated effects on extreme poverty and labor outcomes are similar to our baseline estimates in terms of direction, magnitude, and significance. With this narrowed age groups we observe statistically significant effects on poverty reduction and self-reported sickness. Note, however, that the former is weak, as it is only significant at the 10% level.

Another potential caveat is that age cohorts in the control group may be too young for retirement. That is, their labor-leisure preferences may not be comparable to those of individuals at age of retirement. Hence, we use as control group of individuals aged 71 to 74 years old, whose retirement preferences should be more similar to that of the eligible-for-treatment individuals. Note that this group consists of potential beneficiaries, as these age cohorts were eligible to the program before the intervention. In Panel C of Table 2 we present results using this alternative control group. The income effect is weak and its size more than halves relative to our baseline estimates, suggesting that with the program's expansion the per capita income of the treatment group increased to a level similar to that of potentially pre-treated individuals. The estimated effects on (extreme) poverty, labor, and health outcomes are very similar to our baseline results. We do observe shifts in the direction of the effects on labor force participation and self-reported sickness but the point estimates are close zero and statistically insignificant. Overall, these robustness checks suggest that our estimates are robust to variation in the composition of age cohorts within groups.

4.1.2 Heterogeneous effects

The previous results are average estimates for the eligible-for-treatment group, which may vary between groups of beneficiaries. In Panel A of Table 3 we present estimates of the program's expansion effect for four population groups: men, women, indigenous (individuals who speak an indigenous language), and non-indigenous. We find that the expansion of PAM increased per capita income of both men and women by an amount similar to our average estimates. This is an expected result, as the program made no distinctions by gender. For indigenous people, however, the effect on per capita income more than doubles that for non-indigenous (see column 2).

As before, we only find significant effects on extreme poverty, with the intervention reducing the likelihood of living in extreme poverty for all groups. There are two things to note. First, we find a similar effect for men and women (a five percentage points reduction). Second, the effect for indigenous people is considerably larger than that for non-indigenous (21 v. 3 percentage points reduction). This finding is consistent with recent literature examining the impact of social pensions on the subjective well-being of indigenous people (Juarez and Rodriguez Piña, 2021). These heterogeneous effects also uncover existing differences in the vulnerability to extreme poverty within the elderly population, suggesting that the expansion of PAM was effective in reducing extreme poverty among the most vulnerable.

In our view, reaching the poorest individuals only is also an important limitation of the intervention, as its effect on poverty was consistently small and statistically insignificant across population groups. This is particularly worrisome as the poverty line that we use captures the cost of basic goods (personal hygiene and clothing) and services (transportation) that besides the basic food basket, captured by the extreme poverty line, are necessary for the well-being of the elderly population. The ineffectiveness of the program's expansion to reduce poverty is explained by the small size of the cash transfer and the considerably low per capita income of the elderly population in Mexico. In Figure 3 we show that the per capita income of most new eligible individuals is below the poverty line with or without considering the cash transfer from PAM. This is true for both rural and urban contexts. We also plot the per capita income distribution assuming all eligible-for-treatment individuals in the sample received the cash transfer. Our exercise provides suggestive evidence that the impact on poverty reduction would have been negligible even with a 100% take-up, which questions whether the universalization of social pensions could be an effective instrument against poverty when the cash transfer is relatively small.

Results in column 5 of Table 3 show that the expansion of PAM did not affect the labor force participation of men, women, and non-indigenous. In contrast, we find that PAM's expansion increased the probability of remaining in the labor force by 11 percentage points for indigenous people. This finding confirms that among the most vulnerable, social pensions may not induced retirement but working life. Although small and not statistically different from zero, the point estimates in column 6 suggest a reduction in labor supply for indigenous people and men but an increase for women. In terms of health outcomes, we do not find significant effects for any of these population groups. As discussed previously the point estimates suggest a potential improvement in the health of new eligible-for-treatment individuals.

In Panel B of Table 3 we present estimates of the expansion's effects by locality size: less than 2,500 inhabitants (rural areas), more than 2,500 but less than 15,000 inhabitants (suburban areas, usually surrounding cities), more than 15,000 but less than 100,000 inhabitants (mid-size urban areas or towns), and more than 100,000 inhabitants (big cities). Note that the program's take-up among eligible-for-treatment individuals varies across categories. This can be explained by the fact that the objective population is more difficult to reach in suburban areas and big cities. In developing countries, the poorest individuals tend to live in places of extreme policy neglect: informal settlements (slums) outside cities or marginal lands (steep hillsides) within cities (Marx, Stoker and Suri, 2013). Generally, these areas are difficult to access, affecting the promotion and enrollment of social programs. Estimates in column 1 confirm that the take-up was smaller in suburban areas and cities. In addition, census and household survey data, usually used for the design of social programs, may also undercount populations living in informal settlements, which has important implications for the targeting of interventions (Lucci, Bhatkal and Khan, 2018). Results in column 2 support this argument, as PAM substantially increased income but only in rural and middle-size urban areas, suggesting that the expansion may have not reached the poorest individuals living in suburban areas or cities. In column 4 we present evidence that this was the case, as the effects on extreme poverty were close to zero and statistically insignificant in these areas. In contrast, the expansion of PAM significantly reduced extreme poverty by 11 and 9 percentage points in rural and mid-size urban areas, respectively.

It is important to highlight that the intervention was very successful in mid-size urban areas, as it also reduced poverty by 21 percentage points. In our view, this effect was induced by the large take-up, accurate targeting, and statistically insignificant effects on both labor force participation and labor supply. Surprisingly, we find an increase in poverty (significant at the 90% level) in big cities, which suggests

that reaching the elderly population living in poverty in densely populated areas could be particularly challenging due to the aforementioned factors. In terms of labor market and health outcomes, we find statistically insignificant and relatively small effects, which prevent us from inferring a clear pattern.

4.1.3 Anticipation, substitution, and spillover effects

We have provided evidence that the intervention could have increased the labor supply among new eligible seniors, particularly among indigenous people. Previous literature argues that social pensions represent a reliable source of income that allow beneficiaries to reduce their labor supply in formal jobs and engage in informal economic activities (Bando, Galiani and Gertler, 2020). We examine whether the expansion of PAM induced the substitution of paid work for unpaid work among new eligible individuals. The point estimates in Panel A of Table 4 suggest that PAM's expansion could have increased the substitution of paid work by 7 to 2 percentage points. However, except for men, these effects are statistically insignificant.

As described previously, the expansion of PAM was announced and implemented very rapidly. Yet a concern is that our findings may be driven by anticipation effects affecting the comparability of our control group. One way to identify the presence of anticipation effects is by examining the retirement behavior of individuals aged 63-64, who may have started retiring in anticipation of receiving the cash transfer. Our control group in this case are individuals aged 61-62, who are far from being eligible for PAM and therefore unlikely to change their retirement behaviour. All point estimates in Panel B are close to zero and statistically insignificant, suggesting the lack of anticipation effects.

Another question of interest is whether the expansion of PAM had any effects on individuals co-residing with new eligible seniors. In Figure A.2 we show that the intervention did not affect the labor force participation nor the labor supply of young (11-17 years old) or prime-age men (18-54 years old). The labor supply of young women, however, increased by 2.7 hours per week. Recall that we observe a substitution of paid work in favor to unpaid work among male beneficiaries, which is usually interpreted as reflecting an investment in family businesses. In this sense, one explanation to our result is that the investment in a family business demanded the participation of young women in chores associated to these ventures. This contrasts with previous literature showing that South African girls aged 13-17, who usually work more hours in domestic chores than boys, experienced larger declines in working hours when a household member became eligible for a social pension (Edmonds, 2006).

4.2 Local-Average-Treatment Effect

In Table 5 we present estimates of the local-average-treatment effect of the program's expansion. We only report effects on (extreme) poverty, as our reduced form estimates for labor force participation and labor supply are not statistically different from zero (see Table 2). We start by reporting in column 1 the structural-OLS estimates, which suggest that the effect on poverty was small and statistically insignificant (see Panel A). In contrast, PAM significantly reduced the probability of living in extreme poverty among the treated elderly by 10 percentage points (see Panel B). These estimates, however, are likely to suffer from sample selection bias, as the implementation of the expansion was prioritized in poor localities. To correct for endogeneity, we use the exogenous variation around the eligibility age as an instrument. Results in column 2 provide suggestive evidence that our instrument is relevant, and the reported F statistics show that our results are unlikely to suffer from weak instrument bias. The estimated coefficients in column 4 show that, among treated individuals, the program was successful in reducing extreme poverty only: PAM's expansion reduced the probability of living in extreme poverty by about 11 percentage points.

However, these findings mask substantial variation between treated individuals. Consistent with our DD results, the IV estimates show that the expansion of PAM was successful in reaching the most vulnerable among the treated population, as indigenous people and individuals living in rural areas experienced the largest reductions in extreme poverty: 39 and 20 percentage points, respectively.[14] These large heterogeneous effects by population groups and contexts (rural/urban) are depicted in Figure A.3, where we compare the cumulative per capita income distribution of the treated population with and without PAM. Overall, our results suggest that the expansion of social pensions reduced extreme poverty in Mexico, and that it benefited the most vulnerable. This is particularly relevant, as indigenous people and women in Mexico have historically experienced structural barriers to economic progress that are accentuated in rural areas due climate shocks, limited income sources, and constrained markets (see, for example, Arceo-Gomez and Campos-Vazquez, 2014; Mckinley and Alarcón, 1995; Pagán and Sánchez, 2000; Villarreal, 2010). The IV estimates also confirm that, among the treated population, the expansion of social pensions in Mexico had a limited effect on other well-being dimensions. This is explained by the program's small cash transfer, which was not enough to guarantee both a good life quality and the right to retirement for Mexican seniors. In addition, recent literature argues that that seniors at early stages

[14] IV estimates are available upon request. Note that the point estimates can be easily computed from Table 2 by dividing the coefficient of interest over the corresponding first stage estimated coefficient, which equals the estimated take-up reported in Table 2.

of old-age have the strongest incentives to extend their working lives (Kolsrud et al., 2021). Hence, the limited effects on labor market outcomes that we observe are not completely unexpected.

5. Conclusion

In Mexico, as in many other countries of Latin America and the developing world, most of the elderly do not qualify for a contributory pension (Rofman, Apella and Vezza, 2015). This leaves the elderly population at risk of old-age poverty with extremely limited options (if any) but to keep working and/or depend on aid from informal safety nets such as family members. The impact of social pensions on (extreme) poverty has been overlooked by previous literature, as many social pension programs use means tests to identify the objective population. Hence, it is usually assumed that the effect of social pensions on poverty reduction is self-evident. Many governments, however, do not use means tests or similar mechanisms to target social pensions. This is the case of Mexico, a country with high poverty rates and one of the world's largest social pension programs.

With the objective of preventing old-age poverty and improving the well-being of the elderly, in 2013, the minimum-age eligibility requirement for Mexico's social pension program (PAM) was reduced from 70 to 65 years old. Soon after the announcement of PAM's expansion in 2013, Aguila et al. (2013) examined the financial sustainability of the intervention. They predicted large increases in the cost of the program in the short, medium, and long terms that would affect the impact of the program. In this paper, we evaluate the effectiveness of such intervention in reducing (extreme) poverty. Although previous research has addressed the relationship between poverty and social pensions (see, for example, Barrientos, 2006, 2008; Cruz-Martínez, 2019), to our knowledge, we are the first to provide a systematic analysis of the impact of social pensions on (extreme) poverty. The program's expansion also allows us to examine labor market and health outcomes for individuals at early stages of old-age, who may have different labor-leisure preferences than older age cohorts (aged 70 and older)—the age group examined by most of the previous literature.

Our findings suggest that the intervention was effective in reducing extreme poverty among the most vulnerable population: indigenous people and individuals living in rural contexts. However, we also find a zero-effect in terms of poverty reduction for all population groups, which is mainly explained by the relatively small size of the program's cash transfer and the potential mistargeting of the program in urban areas. This is particularly worrisome as the poverty line that we use captures the cost of basic goods

(personal hygiene and clothing) and services (transportation) that besides the basic food basket, captured by the extreme poverty line, are necessary for the well-being of the elderly population. We also find a substantial increase in labor force participation for indigenous seniors and for seniors living in rural areas. We believe this is due to the country's structural inequalities that are also present among the elderly population. In Mexico, the percentage of indigenous people who live in poverty is nearly double that of the general population. Indigenous people also face barriers to economic progress that are accentuated in rural areas due climate shocks, limited income sources, and constrained markets. Hence, for the most vulnerable seniors, social pensions can represent an effective instrument for relaxing liquidity constraints that prevent them from engaging in small ventures and/or getting access to labor markets other than the local economy. Overall, our study suggests that, when the cash transfer is relatively small or mistargeted, social pensions may not be able to reduce poverty and simultaneously induce retirement among seniors at early stages of old-age. Despite these limitations, PAM has proven to be effective in reducing extreme poverty in rural areas and among indigenous people, who are arguably the most vulnerable population in Mexico.

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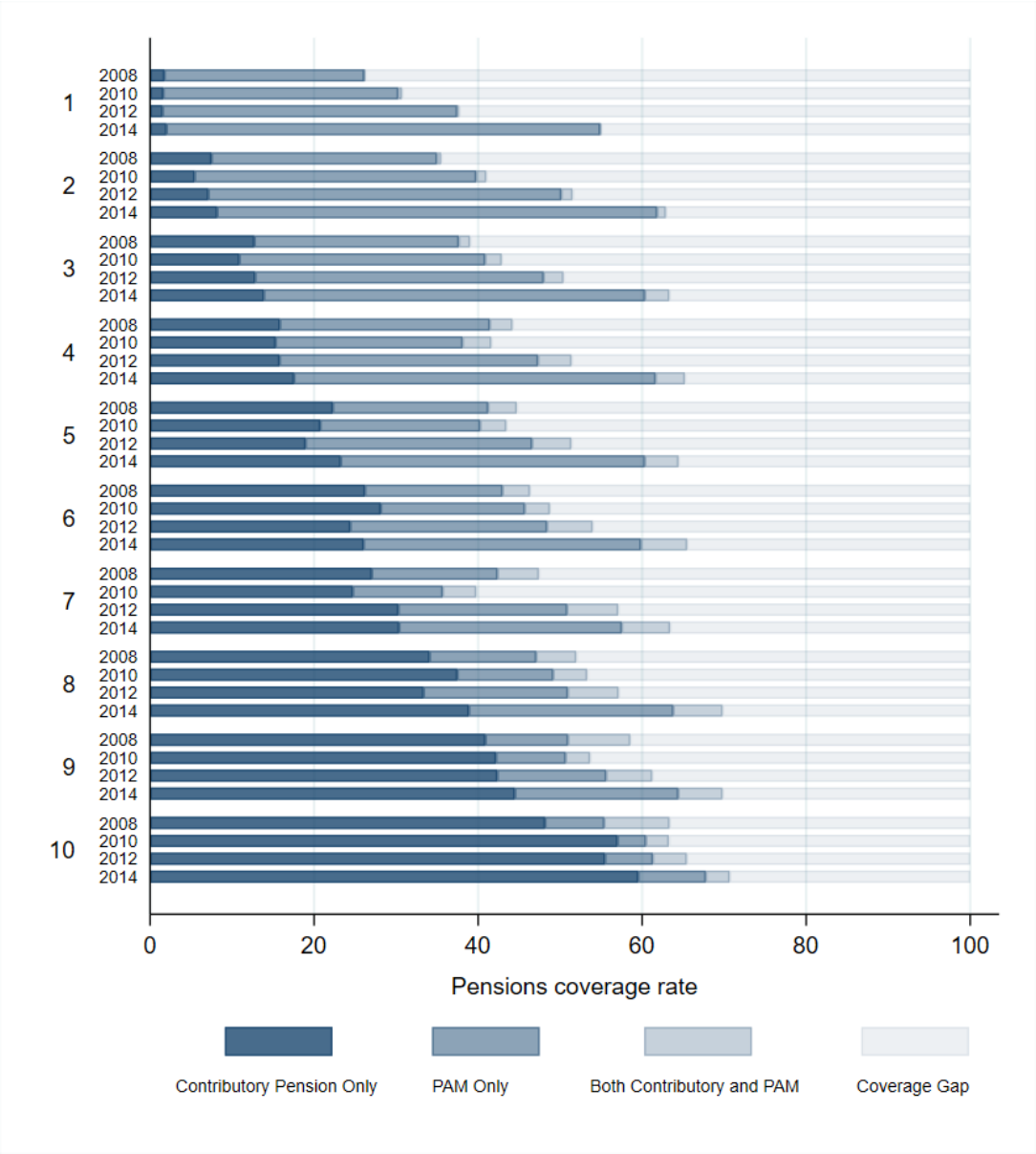
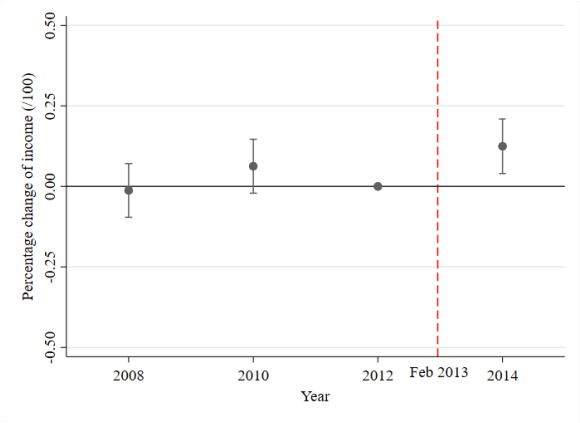
Figures and Tables

Figure 1: Pensions coverage by income decile, Mexico (2008-2014)

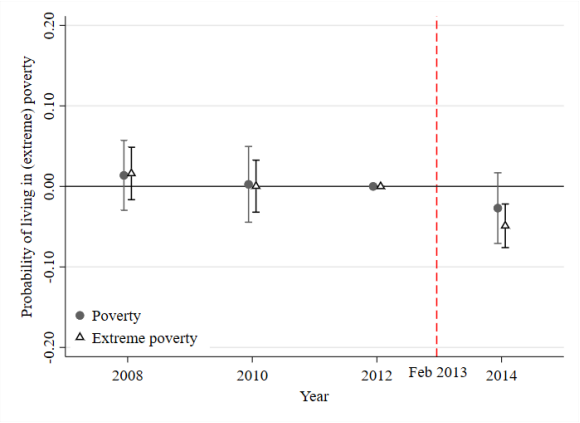


Note: Data are from the Socioeconomic Conditions Module–Household Income and Expenditure National Survey (ENIGH-MCS) 2008, 2010, 2012, and 2014. Contributory pension schemes are based on formal work history. Since formal jobs usually pay higher wages than informal jobs, the share of the elderly getting benefits from contributory pensions is greater in higher deciles of income.

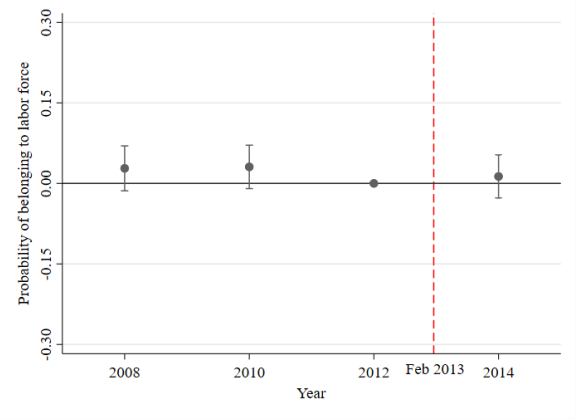
Figure 2: Parallel Trend Assumption



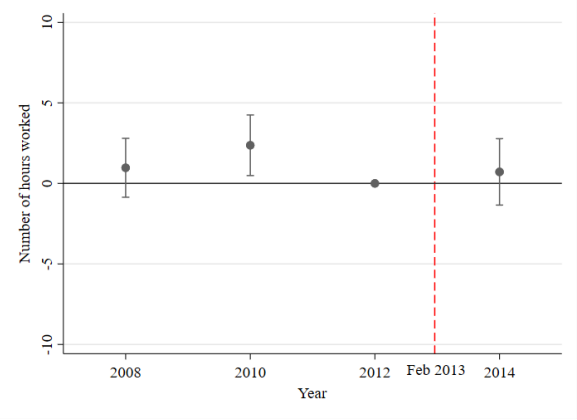
Panel A. ln(Income)



Panel B. Poverty and Extreme Poverty



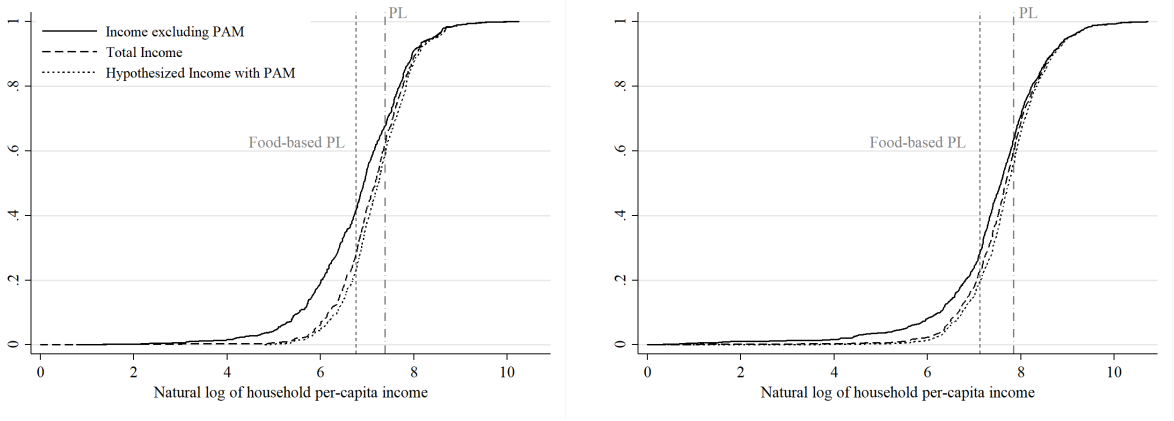
Panel C. Labor force participation



Panel D. Labor Supply

Note: Graph points are coefficients capturing changes in outcome variables for the eligible-for-treatment group relative to 2012 levels. Whiskers show 95% confidence interval. The dotted vertical line depicts the date when the policy intervention was enacted (February 2013). This figure provides suggestive evidence of the parallel trend assumption since we do not observe pre-trends in any of the outcome variables. The expansion of the program reduced extreme poverty, but had no effect on poverty or health outcomes.

Figure 3: Hypothesized income distribution with and without PAM (eligible sample)



A. Rural *B. Urban*

Note: Cumulative income distribution is plotted. We compare (observed) total income versus income without PAM and income with PAM if the program had been given to all eligible individuals. Vertical dotted lines represent the poverty line (PL) and food-based PL in rural and urban regions. This figure shows that PAM is particularly effective reducing extreme poverty in rural areas (see the gap between the income distribution excluding PAM and total income distribution at the food-based PL). However, even universalizing the program, the gain on poverty reduction is negligible (see the gap between total income distribution and the hypothesized income distribution with PAM, at any PL).

Table 1: Summary Statistics

	2012		2014		
	Control Group	Treatment Group	Control Group	Treatment Group	DD
Panel A: Outcome variables					
Per capita Household Income (log)	7.48	7.32	7.57	7.50	0.10**
	(0.04)	(0.04)	(0.03)	(0.03)	(0.06)
Poverty (%)	0.50	0.55	0.50	0.53	−0.01
	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)
Extreme Poverty (%)	0.16	0.17	0.13	0.10	−0.04***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Labor Force Participation (%)	0.55	0.45	0.57	0.51	−0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Labor Supply (hours)	21.58	16.93	20.79	16.78	−0.36
	(0.52)	(0.50)	(0.57)	(0.54)	(1.32)
Panel B: Control variables					
Female (%)	0.61	0.59	0.57	0.61	0.05*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Education (years)	4.49	4.13	5.28	4.28	−0.19
	(0.19)	(0.19)	(0.16)	(0.14)	(0.30)
Indigenous (%)	0.12	0.11	0.10	0.11	0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Cohabitation (%)	0.24	0.35	0.12	0.26	−0.02
	(0.01)	(0.01)	(0.01)	(0.01)	(0.10)
Observations	3,981	2,978	3,971	2,884	13,814

Note: In 2013, Mexico's Social Pension Program for the Elderly (PAM) was expanded. The table reports characteristics of the control and treatment group observed before (2012) and after (2014) the intervention. The treatment group are individuals who became eligible (aged 66-69) for the program as a result of the expansion. The control group are non-eligible individuals (aged 61-64). The table reports weighted mean values and weighted proportions. Clustered standard errors at county level in parentheses. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. The last column reports difference-in-differences (DD) estimates.

Table 2: The impact of expanding social pensions
(DD estimation)

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
Panel A. Baseline						
After×Treat	0.478***	0.125**	−0.027	−0.051***	0.009	0.641
	(0.016)	(0.043)	(0.022)	(0.014)	(0.020)	(1.048)
Observations	13,814	13,814	13,814	13,814	13,814	13,814
Adjusted R^2	0.434	0.199	0.199	0.147	0.316	0.240
Panel B. Narrowed age groups (63-64 v. 66-67)						
After×Treat	0.464***	0.193**	−0.047	−0.065***	0.019	1.202
	(0.019)	(0.062)	(0.030)	(0.019)	(0.025)	(1.275)
Observations	7,302	7,302	7,302	7,302	7,302	7,302
Adjusted R^2	0.418	0.188	0.196	0.139	0.311	0.239
Panel C. Alternative control group (71-74)						
After×Treat	0.460***	0.042	−0.020	−0.079***	−0.004	1.173
	(0.028)	(0.049)	(0.023)	(0.017)	(0.022)	(1.031)
Observations	10,403	10,403	10,403	10,403	10,403	10,403
Adjusted R^2	0.276	0.195	0.198	0.127	0.301	0.230
Panel D. Baseline including individuals 65 years old						
After×Treat	0.405***	0.110***	−0.028	−0.028**	0.011	0.532
	(0.013)	(0.039)	(0.021)	(0.012)	(0.018)	(0.891)
Observations	15,952	15,952	15,952	15,952	15,952	15,952
Adjusted R^2	0.368	0.203	0.202	0.147	0.309	0.234

Notes: Our treatment group are individuals aged 66-69, who became eligible to receive a social pension in 2014. Individuals aged 61-64, who were not affected by the policy change, are our comparison group. All models include controls and state fixed effects. Panel A shows the main results. The expansion of PAM was successful in reducing the probability of living in extreme poverty by five percentage points. This extreme poverty reduction can be explained for two main reasons; first, an increase on income by 13% and, second, a lack of change in labor force participation and labor supply. We do not see effects on health outcomes, although the point estimates suggests an improvement. Panels B C and D show the results of three robustness checks from where we conclude that our main results are robust to changes in the age composition, the comparison group and the inclusion of potentially partially untreated individuals 65 years old, respectively. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Standard errors clustered at municipality level in parentheses.

Table 3: Heterogeneous effects of expanding social pensions (DD estimation)

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
Panel A. Population cohort						
Men						
After×Treat	0.467***	0.129	−0.007	−0.048*	−0.043	−0.598
	(0.023)	(0.076)	(0.034)	(0.024)	(0.030)	(2.022)
Observations	5,730	5,730	5,730	5,730	5,730	5,730
Adjusted R^2	0.430	0.191	0.161	0.142	0.053	0.027
Women						
After×Treat	0.485***	0.122*	−0.038	−0.053**	0.045	1.530
	(0.017)	(0.049)	(0.027)	(0.017)	(0.027)	(1.183)
Observations	8,084	8,084	8,084	8,084	8,084	8,084
Adjusted R^2	0.436	0.202	0.222	0.146	0.050	0.029
Indigenous						
After×Treat	0.524***	0.277*	−0.015	−0.204**	0.115*	−0.415
	(0.038)	(0.108)	(0.044)	(0.062)	(0.053)	(2.502)
Observations	1,710	1,710	1,710	1,710	1,710	1,710
Adjusted R^2	0.479	0.163	0.150	0.135	0.307	0.315
Non-Indigenous						
After×Treat	0.473***	0.108*	−0.028	−0.032*	−0.004	0.736
	(0.017)	(0.046)	(0.024)	(0.013)	(0.022)	(1.138)
Observations	12,104	12,104	12,104	12,104	12,104	12,104
Adjusted R^2	0.430	0.172	0.176	0.094	0.312	0.232

Table 3 (continued): Heterogeneous effects of expanding social pensions (DD estimation)

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
Panel B. Locality size (s_l)						
Rural: $s_l < 2{,}500$						
After×Treat	0.562***	0.153*	−0.053	−0.106***	0.058*	1.798
	(0.023)	(0.067)	(0.038)	(0.029)	(0.029)	(1.558)
Observations	4,677	4,677	4,677	4,677	4,677	4,677
Adjusted R^2	0.505	0.097	0.117	0.129	0.362	0.304
Urban: $2{,}500 \leq s_l < 15{,}000$						
After×Treat	0.482***	0.152	−0.072	−0.019	−0.004	−0.961
	(0.034)	(0.110)	(0.053)	(0.046)	(0.047)	(2.515)
Observations	2,553	2,553	2,553	2,553	2,553	2,553
Adjusted R^2	0.445	0.088	0.133	0.115	0.278	0.193
Urban: $15{,}000 \leq s_l < 100{,}000$						
After×Treat	0.501***	0.292*	−0.207**	−0.093**	0.038	3.217
	(0.035)	(0.114)	(0.062)	(0.036)	(0.053)	(2.779)
Observations	1,980	1,980	1,980	1,980	1,980	1,980
Adjusted R^2	0.456	0.119	0.195	0.066	0.290	0.229
Urban: $s_l \geq 100{,}000$						
After×Treat	0.409***	0.043	0.064	−0.010	−0.023	−0.172
	(0.027)	(0.079)	(0.034)	(0.015)	(0.034)	(1.686)
Observations	4,604	4,604	4,604	4,604	4,604	4,604
Adjusted R^2	0.373	0.124	0.173	0.039	0.285	0.227

Notes: All models include controls and state fixed effects. Panel A shows heterogeneous effects among different groups of individuals. First, we do not find differences between men and women in none of the outcome variables, although point estimates suggest a different response to the cash transfer in terms of labor force participation and labor supply. Second, among indigenous people there is a substantial increase on income and a lager reduction of extreme poverty (21 percentage points), compared with non-indigenous (3 percentage points). We also document that indigenous people increase their labor force participation by 11 percentage points. Panel B shows heterogeneous effects among different locality sizes. For example, results in the rural context are consistent with the results at the national level, although the reduction on extreme poverty is larger. On the other hand, medium-size urban localities experienced a greater increase on income, and significant reductions on both, poverty and extreme poverty. Finally, we do not observe significant effects among small urban localities and big cities. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Standard errors clustered at county level in parentheses.

Table 4: Anticipation and substitution effects of expanding social pensions (DD estimation)

	1	2	3	4
	Full sample	Men	Women	Indigenous
Panel A. Type of labor activity				
Dependent variable: paid work				
After×Treat	−0.025	−0.063	0.003	−0.046
	(0.021)	(0.039)	(0.022)	(0.050)
Observations	13,814	5,730	8,084	1,710
Mean (dependent variable)	0.352	0.440	0.271	0.280
Adjusted R^2	0.103	0.048	0.059	0.115
Panel B. Anticipation effects (61-62 v. 63-64)				
Dependent variable: labor force participation				
After×Treat	0.010	−0.012	0.021	−0.037
	(0.026)	(0.034)	(0.037)	(0.058)
Observations	7,952	3,340	4,612	990
Mean (dependent variable)	0.513	0.730	0.316	0.645
Adjusted R^2	0.302	0.027	0.035	0.305

Notes: Panel A shows that among men paid work decreased in favor of unpaid work. This effect suggests that male beneficiaries may have used the cash transfer to invest in a family business. Panel B rules out any potential concerns about anticipation effects among elderly who are about to become eligible to the program. All models include controls and state fixed effects. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Standard errors clustered at county level in parentheses.

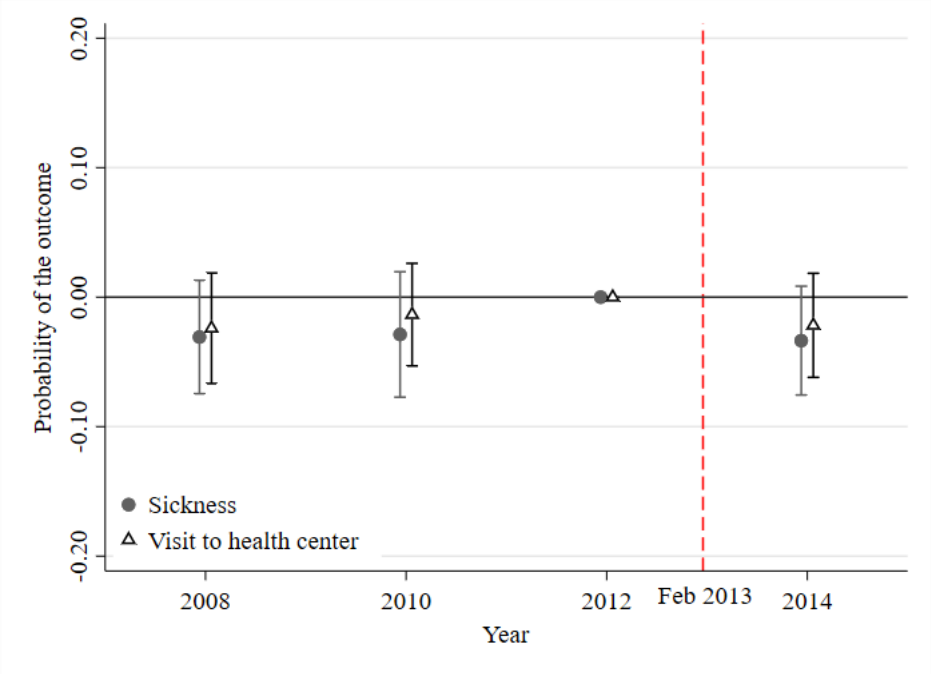
Table 5: The impact of expanding social pensions
(IV estimation)

	1	2	3	4
	Structural-OLS	First Stage	Reduced Form	Structural-IV
Panel A. Poverty				
PAM	−0.024			−0.057
	(0.023)			(0.046)
After×Treat		0.478***	−0.027	
		(0.016)	(0.022)	
Observations	13,814	13,814	13,814	13,814
Adjusted R^2	0.199	0.434	0.199	
F statistic	81.66	77.91	81.76	
Kleibergen-Paap				1,522.83
Panel B. Extreme Poverty				
PAM	−0.100***			−0.106***
	(0.012)			(0.029)
After×Treat		0.478***	−0.051***	
		(0.016)	(0.014)	
Observations	13,814	13,814	13,814	13,814
Adjusted R^2	0.151	0.434	0.147	
F statistic	22.58	77.90	20.66	
Kleibergen-Paap				1,522.83

Notes: In this table we show the effect of PAM expansion on those individuals who actually received the cash transfer from the social pension program. We estimate that the policy expansion reduced extreme poverty by 11 percentage points among PAM beneficiaries. We provide evidence of the relevance condition in column 2, where the instrument is statistically different from zero and we obtained an F statistic greater than 10 in the first stage equation. All models include controls and state fixed effects. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Standard errors clustered at county level in parentheses.

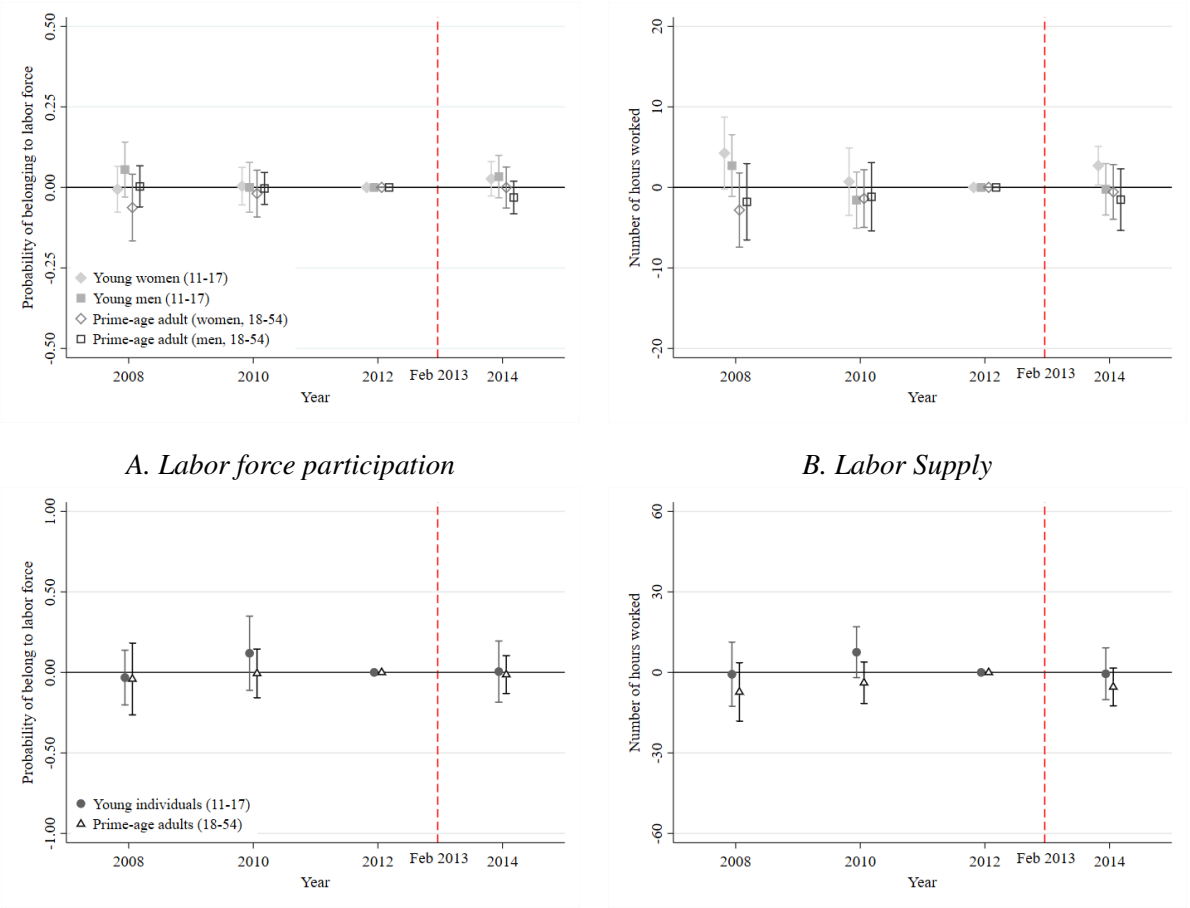
Online Appendix

Figure A.1: Health Outcomes



Note: Graph points are coefficients capturing changes in outcome variables for the eligible-for-treatment group relative to 2012 levels. Whiskers show 95% confidence interval. The dotted vertical line depicts the date when the policy intervention was enacted (February 2013). This figure provides suggestive evidence of the parallel trend assumption since we do not observe pre-trends in health outcome variables. Likewise, we find that the expansion of the program had no effect on health outcomes.

Figure A.2: PAM effect on other household members

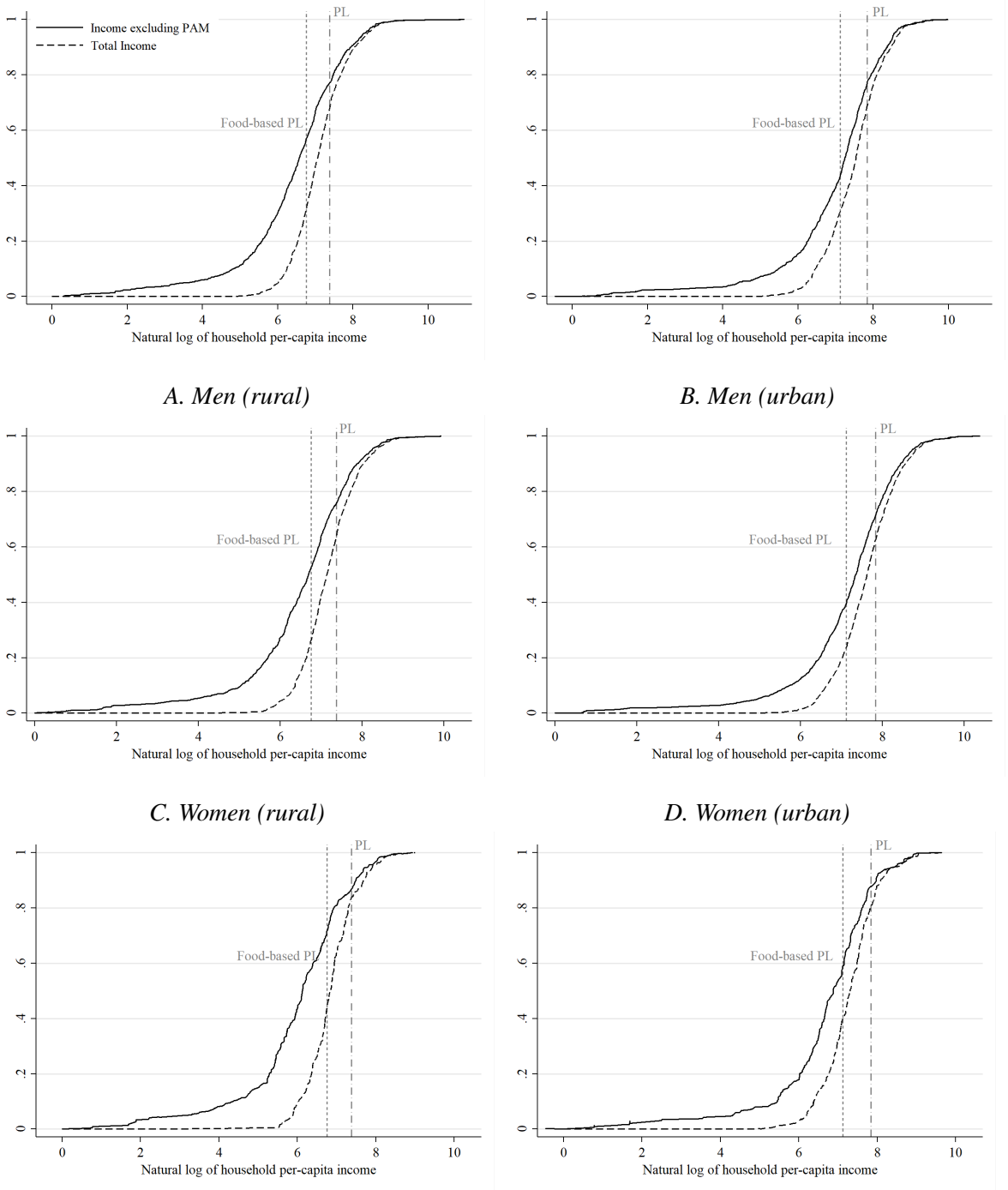


A. Labor force participation *B. Labor Supply*

C. Labor force participation (indigenous) *D. Labor Supply (indigenous)*

Note: Graph points are coefficients capturing changes in outcome variables for the eligible-for-treatment group relative to 2012 levels. Whiskers show 95% confidence interval. The dotted vertical line depicts the date of the policy intervention (February 2013). We do not observe effects on the labor force participation of younger individuals living in the same beneficiary's household.

Figure A.3: Income distribution with and without PAM (treated sample)



A. Men (rural)

B. Men (urban)

C. Women (rural)

D. Women (urban)

E. Indigenous (rural)

F. Indigenous (urban)

Note: Cumulative income distribution is plotted. We compare total income versus income without PAM for different types of individuals. Vertical dotted lines represent the poverty line (PL) and the food-based PL in rural and urban regions. The gaps between the total income distribution and the income distribution excluding PAM at an specific PL represents the poverty reduction.

Table A.1: Proportion of beneficiaries and income from PAM

	Proportion of PAM beneficiaries				Income from PAM			
Locality size (s_l)	2008	2010	2012	2014	2008	2010	2012	2014
Panel A: Full sample								
$s_l < 2{,}500$	58.35	57.05	45.63	42.28	509.73	494.37	490.75	549.23
$2{,}500 \leq s_l < 15{,}000$	21.30	26.09	25.23	21.60	474.80	509.15	495.11	550.85
$15{,}000 \leq s_l < 100{,}000$	4.93	10.34	13.64	12.71	469.85	492.18	470.44	527.43
$100{,}000 \leq s_l$	15.42	6.52	15.5	23.41	968.21	591.24	540.55	591.078
Panel B: Sample excluding Mexico City								
$s_l < 2{,}500$	65.63	57.84	46.47	43.11	509.50	494.42	490.75	549.23
$2{,}500 \leq s_l < 15{,}000$	23.91	26.46	25.63	21.94	470.34	509.15	491.70	549.04
$15{,}00 \leq s_l < 100{,}000$	5.42	10.39	13.9	12.95	436.47	492.33	470.44	527.26
$100{,}000 \leq s_l$	5.04	5.32	14.01	22.00	445.67	502.77	460.85	550.65

Notes: Locality size indicates the number of inhabitants. The proportion of PAM beneficiaries should be read by columns. For example, in 2008 most of the beneficiaries (58%) concentrated in rural localities (with less than 2,500 inhabitants), while the least proportion of beneficiaries belonged to medium-size urban localities (between 15,000 and 100,000 inhabitants). This is still true in 2014, but the proportion of beneficiaries increased in middle-size localities and in big cities (see Panel A). Panel B shows the same proportions excluding Mexico, which already had a strong social pension program even before PAM. Notice how the proportion of beneficiaries in big cities is substantially smaller before 2012, when PAM expanded to all locality sizes.

Table A.2: The impact of expanding social pensions
(DD estimation excluding households with cohabitation of beneficiaries and eligible-for-treatment individuals)

	1	2	3	4	5	6
	PAM Take-Up	Income	Poverty	Extreme Poverty	Labor Force Participation	Labor Supply
Panel A. Baseline results						
After×Treat	0.482***	0.153**	−0.027	−0.062***	0.008	0.726
	(0.017)	(0.054)	(0.029)	(0.016)	(0.025)	(1.275)
Observations	10,435	10,435	10,435	10,435	10,435	10,435
Adjusted R^2	0.439	0.186	0.197	0.147	0.307	0.228
Panel B. Narrowed age groups (63-64 v. 66-67)						
After×Treat	0.483***	0.209**	−0.033	−0.068**	0.036	1.869
	(0.021)	(0.076)	(0.036)	(0.022)	(0.031)	(1.519)
Observations	5,574	5,574	5,574	5,574	5,574	5,574
Adjusted R^2	0.434	0.172	0.195	0.127	0.299	0.225
Panel C. Alternative control group (71-74)						
After×Treat	0.478***	0.201***	−0.019	−0.082***	−0.018	−0.077
	(0.019)	(0.047)	(0.022)	(0.015)	(0.021)	(1.039)
Observations	4,000	4,000	4,000	4,000	4,000	4,000
Adjusted R^2	0.331	0.150	0.176	0.131	0.300	0.217
Panel D. Baseline results including individuals 65 year old						
After×Treat	0.399***	0.135***	−0.024	−0.036**	0.015	0.683
	(0.014)	(0.048)	(0.026)	(0.014)	(0.022)	(1.070)
Observations	12,051	12,051	12,051	12,051	12,051	12,051
Adjusted R^2	0.368	0.189	0.199	0.147	0.299	0.222

Notes: The results of this table exclude households with cohabitation of former (eligible-for-treatment) beneficiaries. Our treatment group are individuals aged 66-69, who became eligible to receive a social pension in 2014. Individuals aged 61-64, who were not affected by the policy change, are our comparison group. All models include controls and state fixed effects. Panel A shows the main results, which are consistent with the effects shown in Table 2. PAM expansion reduced the probability of living in extreme poverty by six percentage points. This extreme poverty reduction can be explained for two main reasons; first, an increase on income by 16% and, second, a lack of change in labor force participation and labor supply. We do not see effects on health outcomes, although the point estimates suggests an improvement. Panels B and C show the results of two robustness checks from where we conclude that our main results are robust to changes in the age composition and the comparison group, respectively. * = Significant at 10% level; ** = Significant at 5% level; *** = Significant at 1% level. Standard errors clustered at county level in parentheses.