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Male Labor Force Participation and Social Security in Mexico

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LABOR AND POPULATION

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Abstract

In 1960, the labor force participation of males 60 to 64 years old in Mexico was 94.6 percent; by 2010, it had declined to 65.2 percent. Other Latin American countries are seeing similar trends, as did developed countries before the 1990s. These trends are important because workers' early retirement affects the financial sustainability of social security systems. In this study, we find that the Mexican social security system is not actuarially fair and provides incentives to retire "early"—before age 65. The system's retirement incentives affect retirement behavior and are potentially one of the main factors explaining the decline in male labor force participation.

JEL classification: J26, J22, J14.
Keywords: Retirement Incentives; Labor Force Participation; Social Security System

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Emma Aguila

1. Introduction

Mexico has experienced a decline of more than 30 percent in labor force participation by males 60 to 64 years old since the 1960s. According to the Mexican census bureau (the Instituto Nacional de Estadistica y Geografia, INEGI), labor force participation for males ages 60 to 64, which corresponds to early retirement age, was 94.6 percent in 1960 and declined to 65.2 percent in 2010. A similar pattern has emerged in other Latin American countries (CISS, 2005; Alvarez et al., 2009). For example, Costa Rica and Panama experienced a decline of more than 25 percent between 1960 and 2000 (CISS, 2005).

Previous literature indicates that these trends are similar to those experienced in developed countries; they have seen a sharp decline in labor force participation among men of retirement age in the past decades (see for example, Mitchell and Fields, 1982; Costa, 1998; Blöndal and Scarpetta, 1999). The decline was most apparent in the United States before the 1990s.

Many studies find that one of the causes for the sustained decline in male labor force participation from the 1970s to the 1990s was the design of social security systems and employer-provided retirement plans that provided incentives for early retirement (for example, Hurd, 1990; Ruhm, 1995; Rust and Phelan, 1997; Lumsdaine and Mitchell, 1999; Gruber and Wise, 1999; Gruber and Wise, 2004; French 2005). Gruber and Wise (2004) provide evidence for the United States, United Kingdom, Belgium, Canada, Denmark, France, Germany, Italy, Netherlands, Spain, Sweden, and Japan that social security systems have contributed to the decline in male labor force participation around retirement age.[1]

[1] Recent studies for the 1990s and 2000s have found that this trend is reversing in the United States. Blau and Goodstein (2010) find that current cohorts reaching retirement age have higher levels of education than previous cohorts and this is one explanation for the recent increase in labor force participation at older ages in the United States.

This is an important public policy topic in developing countries where populations are aging and living longer. Demographic and early retirement trends are important because they affect the financial sustainability of social security systems.

This paper examines the role of retirement incentives in the Mexican social security system on the retirement behavior of men ages 50 to 69. The female sample is very small, so they are not included in the analysis. There are few studies on this topic for Latin American countries, but existing studies include Miranda-Muñoz, 2004; Cerda, 2005; Lanza Queiroz, 2007; Alvarez et al., 2010; and Miranda-Muñoz, 2011. The Miranda-Muñoz (2011) study in Mexico used 1991 to 2000 data from the National Employment Survey (ENE) and found that the youngest generations have the fewest incentives to delay retirement. The ENE is a cross-sectional survey and the author constructed a pseudo-panel using cohort techniques. The authors attribute the decline in incentives to delay retirement to the decrease in real wages and pension wealth due to economic downturns in Mexico during the 1990s. Pension wealth in the pay-as-you-go (PAYG) system in Mexico that was valid during the period of analysis was computed with the average wages five years previous to retirement. Wages and pensions were linked and real wages affected retirement decisions.

The contribution of this paper is to use a rich data set to analyze whether retirement incentives in Mexico's social security system affect retirement behavior. The data come from the Mexican Health and Aging Study (MHAS), which is equivalent to the Health and Retirement Study (HRS) in the United States. This data set allows us to construct social security wealth and retirement incentive measures for the study's sample individuals. We estimate single-year accrual, peak value (Coile and Gruber, 2007), and option value (Stock and Wise, 1990) retirement incentive measures. The incentive measures compare the opportunity cost of retiring today or in the future for each individual in the sample. We exploit the transitions to retirement using panel data from 2000 to 2003 to understand whether the incentives in the social security system play a role in retirement decisions.

The main findings are that lower income employees have more incentives to opt for early retirement. Higher income individuals prefer to delay retirement up to the normal retirement age (age 65 in Mexico). A worker's social security wealth has a

positive impact on the probability of retiring and the incentive measures have a negative impact on retirement; i.e., they encourage delaying retirement. Basically, a negative estimate of the incentive measure indicates that delaying retirement is preferable given that workers' future social security wealth will be greater than in the current period. The estimates of the retirement probability model show that the incentives of the social security system are an important factor in retirement decisions. These results are as we expected and are consistent with the findings in Gruber and Wise (2004).

This paper is organized as follows. Section 2 describes the Mexican social security system. Section 3 describes the methodology we used to build estimates of the incentives to retire every year after the worker becomes age eligible. Section 4 describes the data sets and sample we used in the analysis. Section 5 describes how we estimated workers' social security wealth, what those estimates are, and the estimates of the incentives to retire in the Mexican social security system. Section 6 presents the results of a probability regression model, which includes in the explanatory variables social security wealth and the estimates of the incentives to retire in order to assess the relevance of the incentives or rules of the social security system in retirement decisions in Mexico. Finally, Section 7 presents brief final remarks.

2. Mexico's Social Security System

2.1 Overview

In Mexico, the labor force includes individuals in the formal and informal employment sectors. Workers in the formal sector contribute to the social security system and are entitled to health care services and social security benefits. Contributions to the Mexican Social Security Institute (IMSS) are mandatory for most private sector workers. Altogether, IMSS covered 32.9 percent of the total labor force in 2010. The social security system for public sector workers is called ISSSTE (Social Security and Services Institute for State Workers), and most public sector workers make contributions and receive benefits when they retire. Other institutions in Mexico, such as the army, navy, federal and state governments, and municipalities, provide their own social security services but usually they have a smaller number of workers enrolled than those who are enrolled in IMSS and ISSSTE.

Workers in the informal employment sector include those who work part time, or independently, or for noncompliant private sector firms. According to Perry et al. (2007), the informal sector represented approximately 58 percent of the labor force in 2005. In this study we only analyze male workers who are enrolled in IMSS. Workers with social security benefits from ISSSTE could not be included because the data available do not allow us to identify some components required to estimate their social security entitlements.

In 1997, IMSS reformed the pay-as-you-go (PAYG) social security plan and replaced it with a fully funded system of personal retirement accounts (PRA). The "new generation" of workers that entered the labor market after the social security reform can only claim social security benefits under the PRA rules. The "transition generation" are workers that contributed previously to the PAYG and continue to contribute under the new PRA system. When they retire, they can choose to claim social security benefits under *either* the PAYG or PRA rules,[2] and of course most will choose the plan that pays the highest benefits.

Below we describe in more detail the main paths to retirement in Mexico and other options that could provide incentives for retirement. Normal and early retirement are the main paths for retirement.[3] In contrast to the U.S. social security system, dependent and survivor benefits in Mexico do not provide incentives for couples to make joint retirement decisions. Nevertheless, we describe the design of these benefits. In addition, we discuss incentives to re-enter the labor market after initial retirement and other retirement options through employer-provided or private pensions.

[2] Individuals that contributed to the social security system between 1992 and 1997 have in addition pension funds accumulated at SAR, complementary personal retirement accounts introduced in 1992. The 1992 Mexican pension reform is described in more detail in Aguila (2011). However, SAR92 was a complementary personal retirement account that awarded funds as a one-off payment at retirement. The SAR92 system had many operational inconsistencies that led to a major reform in 1997. In this study, we do not consider any incentives provided by SAR92.

[3] Some individuals may be eligible to claim benefits from both the U.S. and Mexican social security systems due to the well-documented migration from Mexico to the United States. For return migrants, retirement incentives from the U.S. social security system may affect their retirement decisions. However, there is no social security agreement between Mexico and the United States, so contributions to the Mexican Social Security system would not be taken into account in the U.S. system. Aguila and Zissimopoulos (2011), using the MHAS, find that none of the return migrants from the United States to Mexico receive U.S. and Mexican social security benefits; return migrants either receive benefits from the United States *or* from Mexico; 4 percent and 19 percent, respectively.

2.2. Normal and Early Retirement

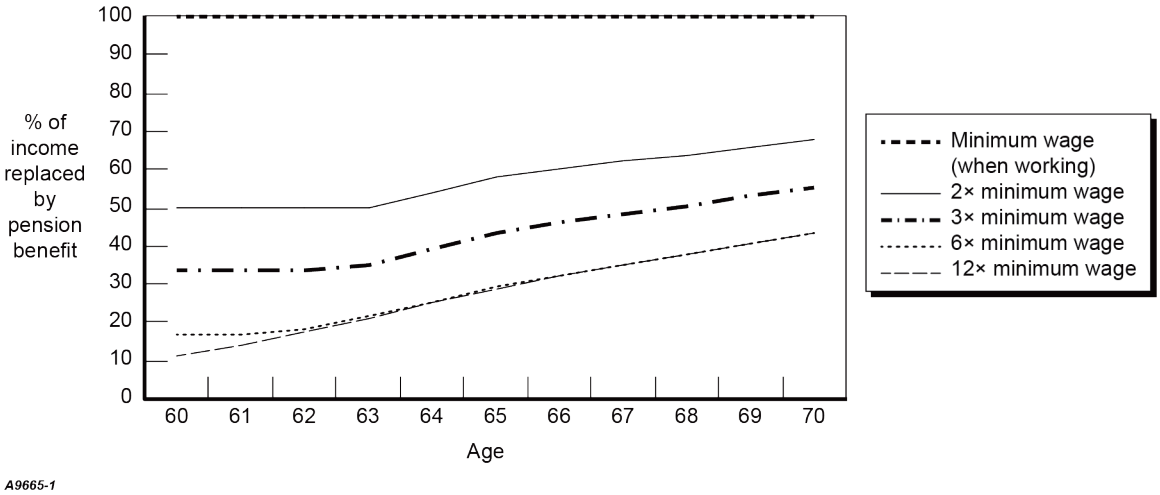
Normal retirement age in Mexico is 65. The IMSS system requires at least 10 years of contributions to PAYG and 25 years to PRA. As the PAYG is a defined benefit system, social security benefits are computed as a proportion of the average wage in the five years before retirement. In the PAYG system, the social security benefits increase for each year of contribution over and above the minimum 10-year requirement. PRA social security benefits are computed based on the amount accumulated in the personal account. The minimum social security benefit guarantee is the minimum wage of Mexico City for the PAYG and PRA. In both cases, social security retirement benefits are indexed to inflation.

Early retirement is from ages 60 to 64 and requires at least 10 years of contribution to the PAYG and 25 years to the PRA systems. In the PAYG, the early retirement social security benefits are reduced by 5 percent for each year below the normal retirement age. For an individual who retires at age 60, social security benefits represent 75 percent of the normal retirement social security benefits. In the PRA, early retirement is not penalized because individuals receive social security benefits according to the amount accumulated in the personal account.

Individuals from the transition generation that do not satisfy the PRA requirements obtain social security benefits under the PAYG rules. We present in Figure 1 the old-age pension replacement rate, i.e. the pension as a proportion of the wage previous to retirement, from age 60 for each level of labor income in number of times the minimum wage. The old-age pension replacement rate measure shows the effectiveness of the pension system in providing income during retirement as it replaces wages prior to retirement. The pension replacement rate is computed assuming 10 years of contributions at age 60. The replacement rate is 100 percent for individuals earning the minimum wage as they receive the minimum pension guarantee. Workers earning the minimum wage have incentives to retire at age 60. However, as labor income increases, the slope is steeper and individuals have more incentives to retire at a later age.[4]

[4] This design of the social security system is valid since 1994.

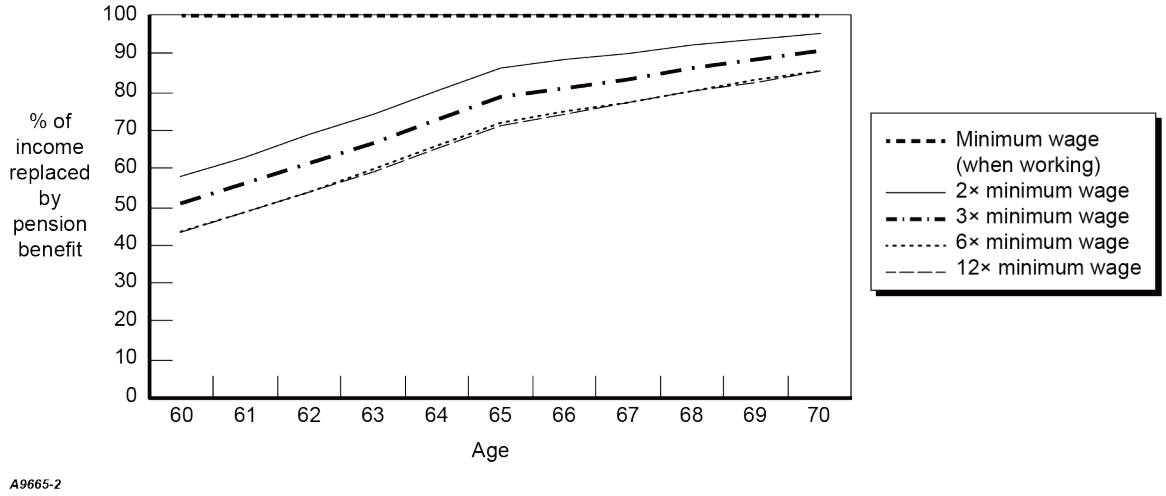
Figure 1. ***Replacement Rate of the PAYG by Selected Levels of Labor Income in Number of Times the Minimum Wage***



The penalty for retiring below the normal retirement age is actuarially equivalent, since the present value of the early retirement social security benefits is equal to social security benefits at age 65. After age 65, social security benefits only increase with additional years of contribution and Mexico has no mandatory retirement age. There are more incentives to continue contributing after age 65 for higher income workers than there are for lower income workers as the replacement rate for additional years of contribution rise with the wage. The incremental increase in social security benefits after age 65 for low-income workers is not actuarially fair because the worker's contribution in every additional year is higher than the increase in the present value of the social security benefits, i.e. the worker will contribute more than he will receive on retirement.

The replacement rate of the PAYG for the transition generation individuals that satisfy the PRA requirements is shown in Figure 2. These are workers that satisfy the minimum of 25 years of contributions. They can choose at retirement the social security benefits in the PAYG or the PRA. Workers earning the minimum wage do not have incentives to reach normal retirement, as they will receive the minimum wage as a social security benefit.

Figure 2. ***Replacement Rate of the PAYG with 25 Years of Contribution by Level of Labor Income in Number of Times the Minimum Wage***



Comparing these findings with Figure 1 we can observe that a transition generation worker whose labor income is the minimum wage has only incentives to claim the early retirement benefits just after contributing 10 years to the social security system. Individuals with a labor income twice the minimum wage or more have higher incentives to reach normal retirement age. In the PRA system, incentives to retire are driven by the amount accumulated in the personal account.[5]

2.3. Dependent Benefits

Mexico's social security benefits system includes dependent benefits. In the United States, couples are incentivized to make joint retirement decisions because the benefits a retiring worker receives for his/her spouse vary according to the employment status of that spouse. In Mexico, a retiring worker obtains benefits for a spouse whether or not the spouse is still working. Since our study focused on the labor status of men, we can say that when a husband in Mexico retires, he obtains the dependent benefit for his wife,

[5] The only exemptions are those individuals in the transition generation who satisfy the minimum of 25 years of contribution, reach the minimum pension guarantee in the PAYG and PRA, and choose to receive benefits under the PRA rules (Aguila, 2011). The latter would apply for those retiring with the minimum pension guarantee between August 1997 and January 2002 as during this period the PRA social security benefits were adjusted to inflation and PAYG social security benefits were adjusted to the minimum wage of Mexico City. The adjustment in the minimum wage has not kept up with changes in prices. Since February 2002, the PAYG and PRA social security benefits are both adjusted to inflation; thus, workers with a minimum pension guarantee tend to have no preference of one system over another.

equivalent to 15 percent of his social security benefits, independent of the working status of the wife.[6]

2.4. Survivor Benefits

Survivor benefits are available to the widower or widow at the death of his or her spouse if the spouse was working and enrolled in the social security system. Benefits are also awarded to the surviving spouse of a retired worker when the worker dies.

2.5. Re-entering the Labor Market

If a worker enrolled in PAYG retires and claims benefits, then begins working again, the PAYG system cancels the benefits until the worker leaves the new job, and the worker continues contributing to the system from the new job. The PRA provides more incentives to work during retirement as social security benefits can be increased every year with the amount accumulated in the PRA from the new job.[7] However, for individuals with the minimum pension guarantee (the minimum flat rate equivalent to the minimum wage of Mexico City) who re-enter the labor market, the social security benefit is suspended until they stop working. Hence, there are no incentives to work again in the private sector for those individuals that have a minimum pension guarantee.

2.6. Employer Provided or Private Pensions

Fewer than 10 percent of private firms in Mexico offer a pension system separate from the federal government's PAYG or PRA systems (Hewitt Associates, 2005). There is no official information on the coverage provided by private pensions; they have been introduced only in the past decades. However, few firms offer them and coverage in terms of the number of workers that receive these benefits is probably minimal.

3. The Sample Used in this Study

[6] The worker can also claim 10 percent of the pension as dependent benefit for each child under 16 years old. A single worker with no children can obtain 10 percent of the pension for each parent but must be his dependent. The worker can claim an additional benefit of 15 percent of the pension when he has no dependents and spouse.

[7] These individuals are exempt from contributions for pensioners' health care services and disability and life insurance.

In this study, we use data from the Mexican Health and Aging Study (MHAS), a two-wave panel obtained in 2001 and 2003 for individuals born before 1951. The data set is nationally representative and it has information on demographic and employment characteristics, health status, access to health care services, family transfers (cash or other support from family members), and wealth for 9,862 households. Spouses of eligible individuals were also interviewed, even when they were less than 50 years old.

In the first wave, individuals were interviewed between May and August of 2001. It is worth highlighting that information was not gathered for only 10.3 percent of the 11,000 households selected. In the second wave, individuals were interviewed from June to September 2003. The response rate in the second wave was also very high, 94.22 percent (MHAS, 2004; Wong and Espinoza, 2004).

We merged the same individuals in ENE (National Employment Survey) 2000 to the MHAS to extend the period of analysis back to 2000 and to include complementary information on employment characteristics recorded in ENE but not in MHAS.[8] The 2002 information is reconstructed from the retrospective questions of the MHAS 2003 questionnaire. The sample is male workers contributing to IMSS for at least one period. The total sample is 802 males ages 50 to 69 years old in 2000. These are cohorts born between 1931 and 1950. The female sample is very small, so they are not included in the analysis.

The total number of person-year observations is 3,208 from 2000 to 2003. Individuals that transitioned from working to not working around retirement age are 215, from which 45 re-entered the labor market. In 587 cases, individuals continued working through the observed span, so these observations are right censored.

Table 1 shows the main characteristics of our sample, which is male workers ages 50 to 69 enrolled in IMSS. The third column shows the descriptive statistics of all males working enrolled to IMSS or other social security institutions or in the informal sector. Our sample includes individuals working enrolled to IMSS. The fourth column presents the descriptive statistics of males that are not working for the year 2000. We observed small differences between our sample and males not working. It is worth highlighting that

[8]The restricted-use linked file was created by the INEGI/Mexico in collaboration with the MHAS research team under NIA/NIH grant number AG18016.

our sample group has a higher proportion of males with undergraduate studies or more than those not working.

Table 1. ***Summary Statistics***

	Males		
	Sample	Working	Not working
Mean age	56.6	57.89	61.3
	(4.9)	(5.2)	(5.4)
Proportion married (percent)	89.6	87.9	85.7
Mean number of children	5.1	5.4	5.8
	(3.0)	(3.3)	(3.4)
Mean number of residents	4.6	4.4	4.2
	(2.1)	(2.3)	(2.3)
Education (percent)			
No schooling	11.5	17.5	19.6
Basic schooling	53.2	53.3	56.5
High school	21.1	17.0	16.0
Undergraduate or more	14.2	12.2	7.8
Occupation (percent)			
White-collar	24.9	18.8	-
Blue-collar	38.7	37.0	-
Services	30.6	18.25	-
Farmers	5.8	26.0	-
	93.8	81.3	87.1
Proportion in urban areas			
Proportion in rural areas	6.2	18.7	12.9
Mean job tenure	23.3	27.7	-
	(11.5)	(12.8)	
Number of observations	802	3,690	1,060

Source: Author's calculations using the 2000 Mexican National Employment Survey (ENE)

All groups in the three columns report five children on average. The mean number of residents per household in all groups is approximately four, which indicates that older adults cohabit with other family members. Most males live in urban areas. As expected, the majority of workers in the sample are blue-collar workers due to the nature of the private sector.

4. Framework: Retirement Incentive Measures

We use the option value, peak value, and one-year accrual retirement incentive measures (Stock and Wise, 1990; Coile and Gruber, 2007; Gruber and Wise, 2004)[9] to understand the incentives individuals have to retire in every year as soon as they reach eligibility. This method focuses on the opportunity cost of retiring, comparing the value of retiring today with the value of retiring in the future. The individual continues to work when the expected present value of continuing in the labor market is greater than the expected present value of immediate retirement.

The model is forward looking at a point in time and allows expectations about future events to be updated as the individual ages. Thus, the retirement decision is evaluated again every period with the new information available. The value function considers a utility from working that depends on after-tax wage (y) from year s until retirement (R). It also includes a utility of retirement that is a function of retirement benefits (B) received until death. β is the discount rate and $pr_{s/t}$ is the probability of being alive at time s conditional on surviving at time t. The term $pr_{s/t}$ is multiplicative assuming independence with earnings and retirement benefits.

$$V_t(R) = \sum_{s=t}^{R-1} pr_{s|t} * \beta^{(s-t)} * U_w(y_s) + \sum_{s=R}^{T} pr_{s|t} * \beta^{(s-t)} * U_R(B_s(R)) \quad (1)$$

The value function depends on retirement age (R), which determines retirement benefits and the date until earnings are received. The individual compares the expected value function of retiring in the first period possible with the highest expected value function of retiring in the future.

$$OV_t(R) = E_t V_t(R) - E_t V_t(t) \quad (2)$$

When $E_t V_t(R) > E_t V_t(t)$ and therefore $OV_t(R) > 0$, the individual continues working, as the value of retiring is higher in the future. On the contrary, if $OV_t(R) \leq 0$, retires. The value function is evaluated up to $T-1$ as there is no mandatory retirement age in Mexico. The option value postpones retirement in the following case:

[9] The option value method has some drawbacks in comparison to using a dynamic programming rule. The main difference is that the option value compares the maximum of the expected value functions and dynamic programming uses the expected value of the maximum. As the maximum of the expected values is lower than the expected value of the maximum, the option value method underestimates the value of retiring in the future. The option value indicates higher retirement incentives before the optimal retirement age estimated with a dynamic programming model (Stock and Wise, 1990).

$$\max\left[E_t V_t(t+1), E_t V_t(t+2), ..., E_t V_t(T-1)\right] > E_t V_t(t) \quad (3)$$

$U_w(y_s) = y_s^\gamma$ and $U_R(B_s(R)) = (k * B_s(R))^\gamma$ where γ is the risk aversion parameter with an underlying utility function of constant relative risk aversion, and k accounts for the disutility of labor $(k \geq 1)$. $B_s(R)$ is the present discounted value of retirement benefits and y_s is the present discounted value of after-tax labor income.[10] The option value function is:

$$V_t(R) = \sum_{s=t}^{R-1} pr_{s|t} * \beta^{(s-t)} * (y_s)^\gamma + \sum_{s=R}^{T} pr_{s|t} * \beta^{(s-t)} * (k * B_s(R))^\gamma \quad (4)$$

The other incentive measures estimated in this study are simplified versions of the option value method. A single-year accrual only compares the value of retiring in period t and $t+1$ $(SSW_{t+1} - SSW_t)$. The peak value is similar to the option value but excludes the present discounted value of future labor earnings. The retirement decision only compares the expected discounted present value of a worker's social security wealth if the worker retired today and the maximum wealth in all future periods.

5. Social Security Wealth

Social security wealth is the present value of an individual worker social security benefits. In order to compute the retirement incentives measures, we first estimate the social security wealth of every worker. The present discounted value of social security wealth is computed as follows:

$$SSW_t(R) = \sum_{s=R}^{T} (1+d)^{-(s-t)} \{(1-I) * [pr_{s|t} * rb_R] + I * [pr_{s|t} * rb_R]$$
$$* [(1-nmpg) * (1-\xi)^{s-t+1}] + I * [pr_{s|t} * rb_R] * nmpg\} \quad (5)$$

Where $T = 101$, the maximum number of years a worker has been alive according to the Mexican National Population Council mortality tables for 2000 estimated from the 2000 Mexican Census data. rb_R is the worker retirement benefit, and d is the discount rate. The term $(1-\xi)^{s-t+1}$ takes into account inflationary losses because before February 2002

[10] The parameters γ, k, and β to estimate the option value used are the same as in Coile and Gruber (2004), so γ=0.75, k=1.5, and β=0.97.

PAYG pensions were adjusted to changes in the minimum wage. Since 2002, the pensions have been adjusted to inflation. Workers who satisfy the requirement for at least 25 years of contributions and who reach the minimum pension guarantee ($nmpg$) amount are better off claiming the PRA pension because it is adjusted to inflation since 1997. Workers with the minimum pension guarantee who retired in 2002 or after are indifferent in terms of indexation of pensions as they obtain the same benefits in the PAYG and PRA systems. I is an indicator for those individuals analyzing retirement decisions before 2002.

The social security wealth formula only includes the benefits from early and normal retirement because they provide incentives for retirement. The survival probabilities ($pr_{s|t}$) were computed from the Mexican life tables 2000 by gender published by the National Population Council (CONAPO). $p_{s|t}$ is estimated as:

$$p_{s|t} = \prod_{t}^{s-1}(1-\lambda_t) \tag{6}$$

Where λ_t is the hazard function or probability to die between time t and time s. The hazard function is estimated as $\lambda_t = \frac{d_t}{S_t}$ where d_t are the persons dead between time t to s and S_t are the survivors at time t. All the cohorts analyzed in this study are in the transition generation. During the first wave of interviews of the MHAS in 2001, these cohorts would have only contributed between four and six years to the PRA and most of their working life to the PAYG system. The PRA social security benefits in this case would only be computed with the amount accumulated in those few years and these cohorts close to retirement age would prefer to retire under the PAYG rules. According to the findings Aguila (2011), the transition generation individuals choose the PRA only when they have contributed to the personal account for at least 22 years. Moreover, these cohorts do not have incentives to re-enter the formal labor market once they have claimed their social security benefits. However, they could start new jobs in the informal employment sector, and because there is no earnings test for these employees, their social security benefits would not be reduced.

Retirement benefits are computed as follows according to IMSS PAYG rules:

$$rb_R = (1-\mu_R) * \left[\psi(\bar{Y}) * \bar{Y} + \varphi * (cy - 10) * \lambda(\bar{Y}) * \bar{Y} \right] \quad (7)$$

Where φ indicates if the individual has contributed more than 10 years to the social security institute, $\bar{Y}$ is the average wage of the previous five years to retirement, $\psi(\bar{Y})$ is the replacement rate which is a decreasing function of Y, $\lambda(\bar{Y})$ is the replacement rate for every year of contribution in addition to 10 years and it is an increasing function of $\bar{Y}$, cy are years of contribution to IMSS, and μ_R is the penalty for early retirement.

$$\bar{Y} = \frac{1}{5} \sum_{s=R-5}^{R-1} Y_s * (1+lb) \quad (8)$$

Where Y_s is the nominal wage before taxes and lb are labor benefits provided by the employer such as meals, uniforms and commissions. Y_s is top-coded to a maximum of 25 times the minimum wage, i.e. the maximum a worker can contribute to the system corresponds to a salary of up to 25 times the minimum wage. For higher income workers that receive a salary greater than the maximum, their social security retirement benefit is computed with a wage of 25 times the minimum wage. After-tax labor income for workers enrolled in IMSS is:

$$y_s = mw * Y_s * [1 - \tau_{IT}(Y_s)] + [1 - mw] * Y_s * \{1 - \tau_{IT}(Y_s) - \tau_{SS}(Y_s + lb) * [1 + lb]\} \quad (9)$$

Where τ_{IT} is the income tax that is an increasing function of Y_s, τ_{ss} is the social security contribution and mw indicates when the worker earns up to the minimum wage with value one and salaries above the minimum wage with value 0. Those workers earning the minimum wage are exempt from paying the income tax, but receive a redistributive subsidy by the government called a salary loan. Additionally, the employer covers a worker's social security contributions. In these cases, before-tax labor income is lower than after-tax wage due to the government subsidy.

The MHAS provides information on after-tax income (y_s). In order to compute social security entitlements before-tax labor income (Y_s) is required. The income tax (τ_{IT}) and social security tax (τ_{SS}) are deducted from the gross labor income to obtain the after-tax wage. The income tax is a function of before-tax labor income but the social

security tax is a function of before-tax labor income plus labor benefits (lb). After rearranging terms, before-tax labor income is:

$$Y_s = mw * \left\{ \frac{y_s}{1 - \tau_{IT}(Y_s)} \right\} + [1 - mw] * \left\{ \frac{y_s}{1 - \tau_{IT}(Y_s) - \tau_{SS}(Y_s + lb) - lb * \tau_{SS}(Y_s + lb)} \right\} \quad (10)$$

The before-tax wage was approximated with an iterative procedure. According to labor regulations in Mexico, the minimum labor benefits (lb) provided by the employer must represent 4.52 percent of a worker's before-tax wage. The income tax brackets (τ_{IT}) are obtained from 1995 to 2003. Labor benefits vary by firm but in this case we assume that all workers receive the minimum lb according to the regulatory framework, as there are no studies that indicate a difference in benefits according to size of firm or industry type. Moreover, the lb proportion has not changed in the regulatory framework since the 1970's. τ_{SS} was estimated taking into account the employee social security contributions to all IMSS services described in Aguila (2011). For workers earning the minimum wage, the employer pays τ_{SS}.[11] Retirement benefits and after-tax labor income are deflated with the Mexican National Consumer Price Index (NCPI) with base year 2002.

5.1. Earnings Profiles

The cohort earnings profiles are constructed with the National Urban Employment Survey (ENEU) from 1988 to 2003. The cohort cells only include individuals enrolled in IMSS.[12] Earnings history is estimated as follows:

$$W_{igt} = \theta_i W_{gt} \quad (11)$$

θ_i is an individual fixed effect that is estimated as W_{ig2000} / W_{g2000} in order to adjust for differences among individuals in the same cohort and education group (see Blundell, Meghir and Smith, 2004). The wage information from 2000 reported in ENE is used to

[11] In 2001 the monthly minimum wage in Mexico City was equivalent to $110.70 U.S. dollars using an exchange rate of 1 dollar for $11.1 Mexican pesos.

[12] Seasonal workers were selected out of the sample because they correspond to the temporary regime of enrollment in IMSS, which was not included in the pension system before the 1997 reform.

adjust past earnings history for each individual.[13] As mentioned in the previous section, pension entitlements are computed with the average wage of the previous five years to retirement. The earliest date earnings are required in order to compute pension entitlements is 1995. In fact, this avoids including earnings before the large macro shock caused by the 1994 economic crisis.

In the 2000 wage variable, 5 percent of the sample has missing observations. We imputed the missing data using Ordinary Least Squares (OLS), controlling for age, gender, education, number of children, total household residents, marital status, household ownership, occupation, number of working hours, self-employed/employed status, and job tenure. Future earnings are estimated from 2001 onwards assuming a constant increase in real wages, which is the average increase around retirement age obtained from the cohort wage profiles. The cohort profiles rate of growth around retirement age is very similar in the three levels of education.[14]

5.2. Social Security Wealth and Retirement Incentives Estimates

Workers' social security wealth computations are shown in Table 2. The retirement incentive measures estimated are presented in Table 3, Table 4, and Table 5. The social security wealth, single-year accrual and peak value measures are in U.S. dollars. The estimates of the option value are measured in utility units so they are not comparable in magnitude to the peak value or single-year accrual. All four tables (Table 2, Table 3, Table 4, and Table 5) present the percentiles of the distribution of social security wealth and each incentive measure.

Workers' social security wealth has a decreasing rate of growth for the 10th percentile, indicating that lower-income workers would be better off retiring as soon as they fulfill the requirements to obtain a pension. Those workers in the median and 90th percentile receive higher social security wealth when delaying retirement up to age 65. The standard deviation shows high variation in social security wealth.

[13] Merging cohort profiles by education and quantiles was also considered, but the cells in the upper part of the distribution had a very high variance and the estimations are not accurate.

[14] The 2001, 2002, and 2003 information on wages provided by the MHAS is not used in the estimation of earnings history to compute pension entitlements because some individuals had already transitioned to not working in 2001 and the information is missing.

Table 2: *Social Security Wealth*

Age	N	10th percentile	50th percentile	90th percentile	Standard deviation
60	408	22,525	25,470	71,420	39,105
61	412	24,552	31,291	91,838	49,807
62	422	23,556	34,116	97,249	54,558
63	427	22,573	37,262	113,720	59,674
64	436	21,721	39,112	117,492	64,106
65	439	21,104	41,289	122,854	67,232
66	441	20,664	40,360	121,591	66,709
67	447	19,864	39,453	120,080	65,926
68	451	18,983	38,563	118,512	65,257
69	451	18,618	37,976	117,143	64,630
70	451	18,232	37,525	112,832	63,845
71	451	18,353	36,751	112,957	63,135
72	451	17,698	35,981	112,420	62,317
73	451	17,187	35,549	110,595	61,423
74	451	16,760	34,941	108,659	60,470
75	451	16,500	34,418	106,619	59,433

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

The results of single-year accrual and peak value follow the same tendency. The incentive measures are computed from age 60, the earliest possible age to retire. In Table 3 we observe that the single-year accrual predicts that individuals in the 10th percentile will choose the early retirement option. In contrast, individuals in the 90th percentile and the median would prefer to work until age 65.

Table 3: *Single-year Accrual*

Age	N	10th percentile	50th percentile	90th percentile	Standard deviation
60	408	-1,277	2,367	11,698	6,112
61	412	-1,368	2,752	11,484	6,088
62	422	-1,368	2,529	10,596	5,978
63	427	-1,251	2,343	10,101	4,834
64	436	-950	795	3,939	2,379
65	439	-3,530	-1,346	-512	2,229
66	441	-3,853	-1,457	-639	2,402
67	447	-4,474	-1,649	-715	2,457
68	451	-4,331	-1,510	-789	2,721
69	451	-5,750	-1,570	-805	4,550
70	451	-4,726	-1,731	-882	2,844

71	451	-4,924	-1,780	-953	3,043
72	451	-5,574	-1,898	-994	3,291
73	451	-5,790	-2,014	-1,093	3,387
74	451	-6,037	-2,058	-1,115	3,594
75	451	-6,407	-2,196	-1,175	3,783

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

In Table 4 we can observe the results for the peak value. The peak value also predicts that individuals in the 10th percentile would choose to retire as soon as they reach the minimum requirements. Individuals in the 90th percentile exhibit different retirement behavior; the peak value shows that they are more likely to respond to incentives to delay retirement until age 65. It is worth highlighting that the single-year accrual and peak value are the same from age 61 for the 10th percentile. This is consistent with the social security wealth for the 10th percentile in Table 2, which indicates that the highest amount is always in the current period when compared to all possible future periods. The latter suggests that the system is not actuarially fair.

Table 4. ***Peak Value***

Age	N	10th percentile	50th percentile	90^{th} percentile	Standard deviation
60	408	-1,062	10,008	42,138	19,628
61	412	-1,368	7,549	34,690	16,184
62	422	-1,368	5,374	25,501	11,635
63	427	-1,251	3,107	14,919	6,830
64	436	-950	847	4,623	3,024
65	439	-3,530	-1,333	-315	2,678
66	441	-3,853	-1,438	-516	2,726
67	447	-4,474	-1,591	-690	2,761
68	451	-4,331	-1,496	-757	2,912
69	451	-5,750	-1,570	-780	4,574
70	451	-4,726	-1,731	-868	2,871
71	451	-4,942	-1,780	-953	3,045
72	451	-5,574	-1,894	-994	3,293
73	451	-5,790	-1,970	-894	3,476
74	451	-6,037	-1,907	-908	3,877
75	451	-6,407	-2,048	-1,006	4,370

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

The option value shows positive values for the 10th and 50th percentiles up to age 64 in Table 5. After 64 years old, the option value is negative. However, in the 10th percentile the positive option values up to age 64 are very small. Those workers in the 90th percentile have positive option values at all possible retirement ages but the estimate shows a decreasing trend.

Table 5. ***Option Value***

Age	N	10th percentile	50th percentile	90th percentile	Standard deviation
60	408	768	18,923	53,362	40,223
61	412	1,480	14,911	43,668	37,447
62	422	725	10,804	36,572	35,233
63	427	1,870	7,961	26,584	33,245
64	436	825	3,245	20,929	32,180
65	439	-1,636	-303	18,488	30,961
66	441	-1,690	-367	16,604	30,126
67	447	-2,027	-294	16,965	29,306
68	451	-1,690	-250	16,664	28,647
69	451	-1,691	-250	15,516	28,329
70	451	-1,706	-263	14,649	27,409
71	451	-1,801	-330	14,026	26,839
72	451	-1,881	-357	12,215	26,333
73	451	-2,011	-342	11,671	25,821
74	451	-2,190	-344	11,357	25,379
75	451	-2,280	-407	12,757	24,967

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

In sum, social security wealth for lower income employees is higher the earlier they retire. In contrast, higher income workers are better off the more they delay retirement. The incentive measures, particularly the single-year accrual and the peak value, indicate early retirement from age 60 to the 10th percentile, and normal retirement from age 65 to the 50th and 90th percentiles of the distribution. The option value predicts normal retirement for the 10th and 50th percentiles.

6. Retirement Behavior

6.1. Empirical Model

This section presents the estimates of the regression analysis that models retirement decisions. The benchmark model estimated is:

$$P(R_{it} = 1) = G(\alpha_0 + \alpha_1 RI_{it} + \alpha_2 SSW_{it} + \alpha_3 X_{it}) \quad (12)$$

Where R_{it} indicates with value 1 when the individual transitions from working to not working. Thus, in period t the individual was not working and in period $t-1$ the individual was working. This is a conditional probability model where G is the cumulative distribution function. G is assumed a standard normal, thus the model is estimated with a probit. The information for each individual is pooled from 2000 to 2003.

There are four periods of data for each individual around retirement age. RI_{it} is the retirement incentive measures estimated in the previous section, SSW_{it} is social security wealth, and X_{it} is a matrix of demographic characteristics. The results are presented using the measures of retirement incentives that are single-year accrual, peak value, and option value. The demographic characteristics included are age, marital status, number of household residents, education, and residence in an urban or rural area. Year dummies to capture macro shocks are also included. The variable total number of residents intends to reflect cohabitation arrangements of different generations in a household.

Other sources of income during retirement are private pensions and U.S. social security retirement benefits. Private pensions are not included due to the very low coverage in Mexico. In fact, only 1 percent of the individuals interviewed in the MHAS 2001 had a private pension. To control for U.S. social security retirement benefits, the model includes a dummy variable indicating U.S. permanent residency or citizenship.

To capture differences in wealth, we included a variable on household ownership. This variable captures differences between individuals that own, rent, or borrow the house they currently live in. The MHAS provides other measures of wealth but unfortunately we could not reconstruct these variables for 2000 and 2002.

According to previous literature, another factor that influences retirement decisions is health status. MHAS has rich information about health status and health conditions but the retrospective questions are not suitable to reconstruct these health variables for 2000 and 2002. We did not include in the analysis variables related to health status.

6.2. Results of the Retirement Probability Modeling

This section describes the results of the retirement probability modeling for each incentive measure. Table 6 summarizes the specifications estimated. The coefficients are the marginal effects of the probit regressions.[15] The Appendix shows the estimates for the other covariates. The sample includes men ages 50 to 69. The first set of results includes no control variables. The second includes demographic characteristics and the third includes demographic and employment characteristics and earnings. The employment characteristics are occupation, employee or self-employed, job tenure, job tenure squared, labor market experience, and labor market experience squared. Experience in the labor market is defined as age minus six years and minus the number of years in school (see Gruber and Coile, 2004). We also included earnings, average earnings of the previous five years, and their squared terms and interactions. The pension wealth, incentive measures and earnings variables are in millions. The option value is in hundred thousands.

Some of the employment and earnings variables are used to compute social security wealth and the incentive measures. Therefore, including them in the retirement probability model may cause identification problems in the coefficients. Table 6 shows the main results including the incentive measures: single-year accrual, peak value and option value. Social security wealth is always statistically significant in the 5 percent level of confidence. The retirement incentive measures are statistically significant in the specification with no control variables and the peak value and option are still significant in the specification including demographic variables. The retirement incentive measures estimates are not statistically significant when included in the regression employment

[15] The same specifications were estimated including a term of linear age or age dummies or cohort dummies providing similar results.

characteristics and earnings. The estimates of social security and retirement incentives measures considerably decline when including control variables.

Table 6. ***Marginal Effect of the Probability of Retirement: Single-year Accrual, Peak Value, and Option Value***

	Single-year accrual	Peak value	Option value
Cohort dummies and no other controls			
SSW	0.5917	0.6316	0.5167
	[0.1502**]	[0.1532**]	[0.1354**]
RIM	-4.8891	-2.0442	-0.0870
	[2.0403**]	[0.7518**]	[0.0334**]
Pseudo R^2	0.0508	0.0513	0.0505
Demographics			
SSW	0.0308	0.0348	0.0293
	[0.0144**]	[0.0150**]	[0.0128**]
RIM	-0.2492	-0.1193	-0.0068
	[0.1846]	[0.0698*]	[0.0037*]
Pseudo R^2	0.2209	0.2214	0.2214
Demographics, employment characteristics and earnings			
SSW	0.0047	0.0051	0.0035
	[0.0076**]	[0.0082**]	[0.0059**]
RIM	-0.0091	-0.0081	-0.0003
	[0.0242]	[0.0155]	[0.0007]
Pseudo R^2	0.2381	0.2386	0.2386
Number of observations	3,028	3,028	3,028

Notes: SSW is pension wealth and RIM is the retirement incentive measure. Demographic variables included in the regression are: cohort dummies, marital status, U.S. citizenship or permanent residency, total number of household residents, years of schooling, and residence in a urban or rural area, and household ownership. Employment characteristics and earnings variables included in the regression are: occupation (blue-collar, services, farmer, professionals), type of job (employed or self-employed), tenure at firm, tenure at firm squared, labor market experience, labor market experience squared, average wage of the previous five years (AW), AW squared, labor income, labor income squared, interaction between AW and labor income, and interaction between AW squared and labor income squared. Cohorts are defined as born between 1931-1935, 1936-1940, 1941-1945, and 1946-1950. The benchmark categories for the dummy variables are: cohort born between 1946-1950, year 2000, and white-collar occupation. ** estimates are significant at 5 percent level of confidence. * estimates are significant at 10 percent level of confidence. Standard errors were corrected with the Huber-White robust method for heteroskedasticity.

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

An increase in $1,000,000 of the single-year accrual without changing pension wealth implies a decline by 4.8 percent in the probability to retire. The latter implies that the probability to retire is lower when pension wealth is greater in the following period than in the current period. An increase in $100,000 of the peak value without changing pension wealth implies a decline by 20.4 percent in the probability to retire as indicated in marginal effect of the second column in the specification without control variables. Hence, the probability to retire decreases when pension wealth in the future is greater than pension wealth in the current period.

The marginal effect of retirement incentive measures is negative even when including demographic and employment characteristics and earnings. The peak value estimate with no control variables is lower than the single-year accrual with the same specification. This may indicate that the next period pension wealth is more important for retirement decisions than pension wealth later in the future. The interpretation of the marginal effect for option value measure is as follows: A rise in 10,000 units decreases the probability to retire by 0.8 percent. The option value marginal effect estimate in the third column with no control variables is -0.0870.

In sum, the social security wealth and incentive measures coefficients are as expected. Social security wealth is always positive, implying a higher probability to retire the greater the pension entitlements. This shows an income effect in the retirement decision. The incentive measures coefficients are negative, indicating that the higher social security retirement benefits are in the future, in contrast to today, the lower the probability to retire in the current period. A substitution effect is present in the retirement decision.

The coefficients of the single-year accrual, peak value, and option value are smaller when employment characteristics and earnings are included. This could suggest that the coefficients of the incentive measures are underestimated as the employment characteristics and earnings may be capturing part of the effect of the social security system.

7. Concluding Remarks

There is an important decline in labor force participation before normal retirement age (65) in Mexico and in other Latin American countries. This trend is similar to that seen in the United States before the 1990s.

We find that the incentives for retirement built into the social security system are important factors in workers' retirement decisions. According to the incentive measures estimated, lower income workers would always choose the early retirement option. Higher income individuals delay retirement in order to claim normal retirement age social security benefits. The accrual rate is in most cases negative, implying that the social security system is not actuarially fair. We find a higher probability to retire when workers have higher social security wealth. The incentive measures indicate there is a lower probability to retire today when social security benefits are higher in future periods. These results are as expected and similar to the findings in Gruber and Wise (2004).

However, this trend may revert because Mexico has reformed its old Pay-As-You-Go system, and new cohorts that start retiring under the new system of Personal Retirement Accounts may face different retirement incentives.

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Appendix

The following tables show the coefficients for the different specifications in Table 6 including only cohort dummies (Table A.1), adding other demographic variables (Table A.2), and employment characteristics and earnings (Table A.3). The probability to retire is slightly higher for households with couples in comparison to households with singles. The variables for number of household residents and U.S. citizenship or residency are not statistically significant. Table A.2 shows that males with more years of schooling have a lower probability to retire. However, the coefficient of years of schooling becomes very small and positive after including occupation characteristics (see Table A.3). This may indicate that occupation could be correlated to years of schooling and is capturing part of the effect. We find a higher probability to retire for individuals that live in urban in comparison to rural areas. The latter could be explained by a higher access to social security in urban areas.

The available variable to capture differences in wealth is home ownership. The coefficient is significant in all the specifications and is positive. Wealthier individuals have a higher probability to retire. Males in blue collar jobs or in service occupations have a lower probability to retire in comparison to males in white-collar jobs. Job tenure, labor market, and earning variables are not significantly different from zero.

Table A.1 ***Probability of Retirement Including Cohort Dummies:* Single-year *Accrual, Peak Value, and Option Value***

	Single-year accrual	Peak value	Option value
SSW	0.5917	0.6316	0.5167
	[0.1502**]	[0.1532**]	[0.1354**]
RIM	-4.8891	-2.0442	-0.0870
	[2.0403**]	[0.7518**]	[0.0334**]
Cohort born 1931-1935	1.1858	1.2468	1.4569
	[0.3641**]	[0.3552**]	[0.3558**]
Cohort born 1936-1940	1.4654	1.4488	1.5610
	[0.2550**]	[0.2543**]	[0.2570**]
Cohort born 1941-1945	0.9011	0.9392	0.9317
	[0.1679**]	[0.1691**]	[0.1684**]
Pseudo R^2	0.0508	0.0513	0.0505

Number of observations	3,028	3,028	3,028

Notes: SSW is pension wealth and RIM is the retirement incentive measure. The benchmark category for the dummy variable is: cohort born between 1946-1950. ** estimates are significant at 5 percent level of confidence. * estimates are significant at 10 percent level of confidence. Standard errors were corrected with the Huber-White robust method for heteroskedasticity.

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

Table A.2 ***Probability of Retirement Including Demographics: Single-year Accrual, Peak Value, and Option Value***

	Single-year accrual	Peak value	Option value
SSW	0.0308	0.0348	0.0293
	[0.0144**]	[0.0150**]	[0.0128**]
RIM	-0.2492	-0.1193	-0.0068
	[0.1846]	[0.0698*]	[0.0037*]
Household couple	0.0298	0.0304	0.0299
	[0.0133**]	[0.0134**]	[0.0134**]
Household total residents	0.0035	0.0035	0.0035
	[0.0024]	[0.0024]	[0.0024]
U.S. citizenship	-0.0411	-0.0420	-0.0381
	[0.0201]	[0.0198]	[0.0239]
Years of schooling	-0.0026	-0.0026	-0.0024
	[0.0011**]	[0.0011**]	[0.0011**]
Urban	0.0530	0.0538	0.0528
	[0.0136**]	[0.0138**]	[0.0139**]
House owner	0.0339	0.0342	0.0337
	[0.0148**]	[0.0150**]	[0.0150**]
Cohort born 1931-1935	0.2533	0.2601	0.2912
	[0.0998**]	[0.0991**]	[0.1049**]
Cohort born 1936-1940	0.2621	0.2594	0.2816
	[0.0711**]	[0.0711**]	[0.0740**]
Cohort born 1941-1945	0.1071	0.1130	0.1141
	[0.0291**]	[0.0304**]	[0.0304**]
Pseudo R^2	0.2209	0.2214	0.2214
Number of observations	3,028	3,028	3,028

Notes: SSW is pension wealth and RIM is the retirement incentive measure. The regressions include year dummies. The benchmark categories for the dummy variables are: cohort born between 1946-1950, and year 2000. ** estimates are significant at 5 percent level of confidence. * estimates are significant at 10 percent level of confidence. Standard errors were corrected with the Huber-White robust method for heteroskedasticity.

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).

Table A.3 ***Probability of Retirement Including Demographics, Employment Characteristics and Earnings: Single-year Accrual, Peak Value, and Option Value***

	Single-year accrual	Peak value	Option value
SSW	0.0047	0.0051	0.0035
	[0.0076**]	[0.0082**]	[0.0059**]
RIM	-0.0091	-0.0081	-0.0003
	[0.0242]	[0.0155]	[0.0007]
Household couple	0.0003	0.0003	0.0002
	[0.0005**]	[0.0006**]	[0.0004**]
Household total residents	0.0000	0.0000	0.0001
	[0.0000]	[0.0001]	[0.0001]
U.S. citizenship	-0.0003	-0.0004	-0.0002
	[0.0006]	[0.0007]	[0.0005]
Years of schooling	0.0001	0.0001	0.0001
	[0.0001*]	[0.0001*]	[0.0001**]
Urban	0.0005	0.0005	0.0003
	[0.0009**]	[0.0008**]	[0.0007**]
House owner	0.0003	0.0003	0.0002
	[0.0005**]	[0.0005**]	[0.0004*]
Occupation, blue collar	-0.0004	-0.0003	-0.0003
	[0.0007**]	[0.0006**]	[0.0005**]
Occupation, services	-0.0004	-0.0004	-0.0003
	[0.0007**]	[0.0007**]	[0.0006**]
Occupation, farmer	-0.0001	-0.0001	-0.0001
	[0.0002]	[0.0002]	[0.0002]
Occupation, professionals	-0.0002	-0.0002	-0.0002
	[0.0004]	[0.0004]	[0.0003]
Employee/self-employed	0.0000	0.0000	0.0000
	[0.0001]	[0.0001]	[0.0001]
Tenure at firm	0.0000	0.0000	0.0000
	[0.0000]	[0.0000]	[0.0001]
Tenure at firm $^{\wedge 2}$	0.0000	0.0000	0.0000
	[0.0000]	[0.0000]	[0.0001]
Labor market experience	0.0001	0.0001	0.0001
	[0.0003]	[0.0002]	[0.0002]
Labor market experience $^{\wedge 2}$	0.0000	0.0000	0.0000
	[0.0000]	[0.0000]	[0.0001]
Average wage of previous 5 years (AW)	-0.0472	-0.0350	-0.0422
	[0.3219]	[0.3074]	[0.2504]

AW ^2	0.0000	0.0000	0.0000
	[0.0000]	[0.0000]	[0.0001]
Labor income	-0.0315	-0.0344	-0.0204
	[0.2954]	[0.2874]	[0.2253]
Labor income ^2	0.0000	0.0000	0.0000
	[0.0000]	[0.0000]	[0.0001]
AW*Labor income (interaction)	-1.3917	-1.1605	-1.7977
	[7.9711]	[7.6998]	[7.3067]
AW* ^2 *Labor income ^2 (interaction)	0.0000	0.0000	0.0000
	[0.0000**]	[0.0000**]	[0.0000*]
Cohort born 1931-1935	0.0002	0.0002	0.0002
	[0.0003]	[0.0003]	[0.0002]
Cohort born 1936-1940	0.0003	0.0002	0.0002
	[0.0005]	[0.0004]	[0.0003]
Cohort born 1941-1945	-0.0002	-0.0002	-0.0002
	[0.0007]	[0.0007]	[0.0005]
Pseudo R^2	0.2381	0.2386	0.2386
Number of observations	3,028	3,028	3,028

Notes: SSW is pension wealth and RIM is the retirement incentive measure. The regressions include year dummies. The benchmark categories for the dummy variables are: cohort born between 1946-1950, year 2000, and white-collar occupation. ** estimates are significant at 5 percent level of confidence. * estimates are significant at 10 percent level of confidence. Standard errors were corrected with the Huber-White robust method for heteroskedasticity.

Source: Author's calculation using the 2001 and 2003 Mexican Health and Aging Study (MHAS) and the 2000 Mexican National Employment Survey (ENE).