The Impact of Risk and the Financial Crisis on Perceptions of Privatized Social Security and Retirement Planning

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Abstract: How do investors from broad backgrounds understand investment risk? How does exposure to negative shocks impact their valuation of risk, their valuation of social security, and their retirement knowledge and planning? We use a new household survey in Mexico's privatized social security system linked to administrative records form the privatized Mexican Social Security System to examine these questions. Using policy-induced exogenous shocks to investment returns around the financial crisis and a representative 7,800 person household survey data set linked to administrative data we will estimate how negative returns to social security accounts affect knowledge of social security system rules, risk preferences, value of the social security account and plans for retirement. We find some evidence that low or negative returns cause increased financial knowledge among men, and that high returns increase reliance on and value of the retirement account and financial instruments more generally among women. Our results contribute new insights into how individuals understand and learn about investment risk and plan for retirement with personal ownership over retirement accounts.

I. Introduction

There is an increasing movement to give workers greater control over pensions, allowing them to personally manage their retirement investments. However, there is growing empirical evidence that individuals may not make substantially wiser decisions when managing their own retirement funds, and this may have equilibrium impacts for competition, efficiency and wealth at retirement for pension systems covering a broad spectrum of the population. For example, there is a growing literature measuring financial literacy and showing how it correlates with measures of savings, retirement planning, and investment choice ((Lusardi and Mitchell [2006], [2008] and [2010]), Hastings and Tajeda-Ashton [2008], Hastings, Mitchell and Chyn [2010], Hastings [2010]). Financial literacy is measured as the ability to answer a series of questions measuring basic numeracy skills and financial knowledge necessary to make decisions for long-term savings and investment. In general, those with lower education levels and lower income levels are less likely to be able to do basic division, work with probabilities, understand compounding, inflation and diversification on investment returns. This suggests that consumers may not be sufficiently adept decision makers to incentivize efficient markets, particularly in markets that cover broad socio-economic groups.

In addition, even among the educated and financially literate, experienced and educated investors engage in return chasing, overconfidence, and myopic loss aversion, resulting in lower returns for their personally managed investments relative to diversified, passively managed ones (Benartzi and Thaler [1995], De Bondt and Thaler [1985, 1986], Gneezy and Potters [1997], Chevalier and Ellison [1996], Odean [1998, 1999], Barber and Odean [2001], Choi et al [2006], Grinblatt and Keloharju [2006]). Thus, it is unclear if fully-funded systems based on private accounts can yield more efficient outcomes and greater wealth at retirement than traditional pension models with government management.

This paper contributes to this literature by examining how investors responded to default investment risk reassignment and market volatility in Mexico's privatized pension market for the period surrounding the financial market crash. This event and context provides insights on several levels. First, the government liberalized investment regulations for the system near the height of the financial market bubble, allowing fund managers to invest more heavily in equity indexes and real estate derivatives. Account holders were moved by age as a default into newly-created higher-risk funds. This default allocation creates a natural experiment in risk exposure and returns experienced in the privatized social security account. We use a new linked data set of household survey response linked to administrative records in Mexico's social security system to examine the following questions:

• How did risk exposure in the social security account impact risk preferences as individuals learned about risk?

• How did risk exposure impact knowledge of system rules, risk of alternative investments, knowledge of own account balances?

• How did risk exposure impact stated dependence on social security for funding retirement?

• How did risk exposure impact stated valuation of social security benefits?

• How did risk exposure impact formal sector labor market participation by age and gender?

Overall, we find some evidence that returns caused an increase in financial knowledge among subgroups in the population. We find increases in risk aversion for older male workers who experienced lower returns. We find some evidence that younger male workers were more able to answer compound interest questions in the Big 3 financial literacy battery correctly if they had lower returns. Older male workers and younger female workers were also more likely to understand risk and diversification concepts if they were exposed to lower returns. We find some

evidence among older female workers that higher returns increased knowledge of retirement rules in the system, suggesting that larger account balances cause them to find out the rules governing use of the pension account. We also find that higher returns caused older women to say that they use banks and investment vehicles to save (as opposed to informal savings mechanisms popular in Mexico), and to say that they will depend on their Afore account as one of their primary sources for financing their retirement. Interestingly, we do not find that increased returns increase formal sector participation. We find the opposite for men, suggesting that the impact of increased unemployment insurance benefit withdrawal with increased returns outweighed an increased incentive to work in the formal sector for the savings benefits during the economic downturn.

II.   Background on Mexican Privatized Pension System

Mexico's privatized social security system has been in effect since July 1, 1997. The objective of the reform was to make the pension system financially viable, reduce the inequality of the previous pay-as-you-go system, and increase the coverage and amount of pensions through the establishment of individual ownership over retirement account contributions. The government approved private fund administrators called Afores (Administradoras de Fondos para el Retiro) to manage the individual accounts and established CONSAR to oversee this new Sistema de Ahorra para el Retiro (SAR). Six-and-half percent of wages are deposited bimonthly into the SAR account, and the worker can withdraw from this account at retirement (age 65 for men and age 60 for women), disability in old age, and for a limited amount of insurance when unemployed.[1] In June 2007, SAR had over 25 million registered accounts, and total funds in the system exceeded 1.14 trillion pesos.

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[1] Mandatory contributions to the retirement account come from three places: the worker contributes a mandatory 1.125% of her base salary, the employer contributes an additional 5.15%, and the government contributes 0.225% of

Over the course of the system, there have been between 11 and 21 Afores operating in the market place, with waves of consolidation and entry. During our sample period, March 2008 through December 2009, there were 14 to 18 AFORES in the market. CONSAR approves each Afore's entry into the market. Afores must submit fee schedules for approval and must seek CONSAR's approval for any subsequent fee changes they wish to implement. Table 1 lists the Afores with their entry date as well as a description of the firm. The Afores range from prominent Mexican banks like Banamex to international investment firms like HSBC to department store chains like Coppel (similar to Sears).

Afores, or fund managers, offer investment funds with government restrictions on investment vehicles and risk. At the inception of the system, each fund manager had to offer one fund, called Siefore Basica Siefores (Siefore is an acronym for "Specialized Investment Groups for Retirement Funds"). This fund was limited to bonds, with no restriction on the amount of Mexican government bonds. The Siefore could invest in corporate bonds (Mexican) with at least AA- rating up to 35%, with a 10% cap on financial sector corporate bonds. In 2004, CONSAR moved to liberalize investment regulations. This started with the mandated introduction of an age-based Siefore system – Afores had to offer two age-based investment funds a "higher-risk" fund for workers 55 and under called Siefore Básica 2 (SB2) and a "low-risk" fund for workers over 55 called Siefore Básica 1 (SB1).[2] Management fees were set at the Afore level, so the same management fee applied to both Siefores within each Afore. In addition, affiliates could not split

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the base salary as well as a "social contribution" of 5.5% of the inflation-indexed Mexico City minimum wage (Sinha (2003)). Workers can withdraw unemployment insurance from the account of 1-3 months of salary depending on the amount available in the account and their contribution history. Workers must have 3 years of contributions to the account to qualify for unemployment insurance withdrawals.
[2] In March of 2008, the system moved to a 5-fund age-based system introducing 3 'higher-risk' funds with broader investment possibilities for younger workers.

their funds between Afores or Siefores and had to keep their funds in only one fund at one fund administrator at a time.[3]

From 2004 to 2007, CONSAR passed several regulations lifting investment restrictions on these two Siefores, so that by the end of 2007, SB2 could invest up to 15% of net assets in major stock indexes and 20% of net worth in foreign debt, and SB1 could invest up to 15% in foreign debt.[4] Hence, Siefores were effectively fund managers that could invest in government bonds, high-rated corporate bonds, and broad equity indices.[5] When we test for persistent outperformance using monthly returns, we do not find significant alphas for the Siefores nor do we find a relationship between point estimates for alpha and average fees charged.[6]

In March of 2008, CONSAR regulations moved the market from a 2-fund system to a 5-fund system (SB1-SB5). After April 1, 2008, each account was re-assigned to five different Siefores according to the account owner's age: Siefore Básica 1 (SB1) for 56 year old or older employees, Siefore Básica 2 (SB2) for employees between 46 and 55 years old, Siefore Básica 3 (SB3) for employees between 37 and 45 years old, Siefore Básica 4 (SB4) for employees between 27 and 36 years old, and Siefore Básica 5 (SB5) for employees 26 years old or younger. Workers were reassigned by age to a Siefore within their current Afore as a default but could request to transfer to another Siefore (or Afore) as long as they satisfied the minimum age requirement for such Siefore.

Under the new investment regime SB1 was required to hold at least 51% of its assets in inflation protected Mexican government bonds but could hold up to 10% in major stock-market indexes. SB2, SB3, SB4, and SB5 allowed for increased 'risk', with caps on instruments linked

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[3] For these reasons we will focus our analysis on *Afore* choice since Siefore choice is completely determined by age of the worker and has no impact on relative costs.
[4] Principal Protected Notes and Exchange Traded Funds tied to major stock indices.
[5] Hastings and Tejeda-Ashton (2008) provide more detailed information on investment requirements and holdings for the Siefores during this time period.
[6] Specifically we calculated monthly returns for each Siefore, and measured performance relative to a Mexican Stock Market Index and an A rated or higher Mexican corporate bond index.

to stock market indexes of 15%, 20%, 30% and 40% respectively. SB2 could invest 5% in investment-grade structured assets, while SB3-SB5 could invest up to 10%. A table describing the investment regulations appears in Appendix I. Importantly, to move from the 2-Siefore system to the 5-Siefore system, CONSAR moved accounts to the default-by-age Siefore within the account holder's current Afore in March of 2008. *Nearly 100% of account holders complied with this move and did not switch their Siefore in the subsequent year.* This is not surprising as Hastings (2010) finds using a detailed household survey of system affiliates that even by 2010, only 24% of respondents were familiar with the term 'Siefore,' and of those 24%, only 8% knew that within an Afore, the Siefores are meant to offer different risks according to age. Those who knew what Siefores were had over twice the income and college education rates as the sample.

Aside from investment regulation changes, there were two additional important provisions in the new regulation. First, Afores were required to eliminate load fees and could only charge a single fee as a percent of assets under management.[7] Second, the regulation also impacted the way in which official information about the Afores was presented to the public. Instead of presenting information on management fees alone (see Duarte and Hastings (2010)), CONSAR required that all Afores present a comparative table of *net returns* to potential clients at the time of switching and in all account statements sent home to clients. This table was updated monthly and presented the net return, the management fee, and the gross return in nominal annual percentage rates for every Afore operating in the system. Next to the management fee, between one to three peso signs appear to denote cheap versus expensive Afores. This change was done to increase competitive pressure on past returns while still highlighting management costs, hopefully increasing investment efficiency and account returns in the long run.[8]

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[7] For a discussion of prior fee structure please see Duarte and Hastings (2010).
[8] Conversations with policy makers shaping the reforms.

Table 2 shows the implications of this change for investment category allocation for workers reassigned to new Siefores according to age category on the eve of the regulatory change. The largest change was an increase in the investments in foreign equity indexes. The Afores responded differently to the new investment limits; some Afores, like Inbursa (Telemex), retained their prior position in equities and varied investment decisions relatively little across the SB2-SB5. In contrast, Afores like Profuturo GNP, Invercap, and IXE raised equity limits for SB2 to near the cap and increased equity holdings by 100% between SB2 and SB5. These differences imply that people of different ages and different baseline Afores were exogenously exposed by default to different changes in investment risk exposure for their SAR account.

It is important to note that the SAR account serves two primary purposes: it is a savings account for retirement, but it also functions as Unemployment Insurance. Workers who have contributed a minimum number of months to the SAR account have the right to withdraw up to 3 months of unemployment insurance from the SAR account if they become unemployed. Thus, although a retirement savings account can take on more risk at young ages since the funds are being held for a long term, in this case, young workers are likely to use the majority of their account's current funds for Unemployment Insurance. Hence, it is not clear that the life-cycle model for savings and retirement is a correct model for accounts that also must function for immediate Unemployment Insurance (UI) needs.[9] If workers are risk averse for immediate UI needs, but are unaware of the differences in risks across Siefores, this move to greater risk may significantly impact workers' utility and benefit from the SAR system. In addition, if equity returns are negatively correlated with unemployment rates, this problem is exacerbated.

Table 3 shows 1 year returns in APR from June 2008 to June 2009 calculated using Afore-Siefore share prices. Across Afores, returns are higher for older workers, and lower for

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[9] In fact, Duarte and Hastings (2010) show that qualifying for UI and entering a spell of unemployment increases the probability that workers file to switch Afores by 100-400% across demographic groups.

younger workers who were moved to riskier funds. Interestingly, pre-reform Afores like Inbursa weathered the financial crisis relatively well even thought they were cited as examples of underperformers, when compared to Afores like IXE, and part of the reason the government should move to increase competitive pressure on past returns, despite the fact that the current 2-Siefore investment system had only existed during a dramatic climb to the peak of a business cycle.

The move to increase risk had a large impact on the risk positions of savings and retirement accounts and unemployment insurance benefits for workers moved by default into SB3-SB5, particularly if they were in an Afore that adopted a relatively aggressive response to the investment liberalization. We now examine how this change in returns impacted individual's financial literacy, risk preferences, knowledge of system work and valuation of their savings for retirement account using a new detailed survey of approximately 7800 SAR account holders linked to their SAR account histories. We will use this exogenous change in past returns to test how preferences and sensitivity to past returns changed after the financial downturn and how this varied across workers of different demographic backgrounds.

III.   Data and Empirical Model

This paper uses two data primary data sets. First, we use a new and unique household survey data set linked to administrative data records for each person from the privatized social security system. The household survey is called the EERA (la Encuesta de Empleyo, Retiro y Ahorro). The EERA was collected in winter 2010-2011, and covers over 7,800 households randomly sampled from the population of social security account holders in Mexico. The survey contains five main modules:

1.   Demographic information: General questions are asked about the participant, his/her home, and his/her educational history.

2.   Pension choice and familiarity with pension system: Questions are asked regarding the participants' experience with the Sistema de Ahorro para el Retiro (SAR) or System for Saving for Retirement, their savings habits, and their expectations for retirement, and their valuation of their SAR benefits using hypothetical scenarios. Questions are also asked about use of system benefits such as unemployment insurance.

3.   Savings and investment: Questions are asked about the participants' experience with savings and investments, their vehicles for savings, their family's participation in other savings plans (private or alternative public systems), their debt and home ownership.

4.   Financial literacy: Hypothetical questions are asked regarding numeracy, money management and particular financial decisions. Risk preferences are also measured.

5.   Work history: Questions are asked regarding the participants' work history from January 2005 to the present, including questions covering compensation, contracting and employment status.

These modules took approximately 45 minutes to complete. The survey was administered by highly trained and college educated staff, and multiple, careful controls and audits were in place to ensure the highest quality of survey data.

We use these survey responses and linked administrative data records from the SAR for 2007-2011 that record all account information, basic affiliate demographics, and every switch between Afores in the system. The survey records are linked to the administrative records using an anonymous identification number. We use the administrative records to construct baseline Afore and Siefore that each individual is in, age and date of birth. With these we can construct measures of returns for each investor, and instrument for returns using assignment to default Siefores in March of 2008.

Table 4 shows summary statistics for the survey sample. Also reported are summary statistics for the full sample of SAR account holders in Distrito Federal (D.F.) from which the

EERA sample was drawn. Column 1 shows mean characteristics for the overall SAR population in D.F. while Column 2 shows the mean characteristics for the survey sample. Column 3 reports difference in means between the survey sample and the full sample and Column 4 reports the weighted difference in means accounting for probability of being selected into the survey sample. Averages for characteristics like age, gender and time in the system for the EERA survey sample is similar to that of the SAR population in D.F. The demographic characteristics of the survey sample is statistically different but economically similar to the population, with plenty of overlap (see standard deviations) allowing for a simple re-weighting to match survey sample to population characteristics. Differences between the sample and the population are primarily attributable to differences in contact information quality across the Afores. The last 2 rows show the fraction of account holders in the full sample and the survey sample that belong to Afore XXI and Afore ING. XXI clients are oversampled, while ING clients are undersampled due to differences in contact information quality. Within Afores, sample and population characteristics are similar.

We want to examine the impact that exposure to higher losses (negative returns) due to Seifore reassignment had on individual's risk preferences, financial literacy, and value placed on the SAR account. To do so we run regressions of the following form:

$$y_i = \alpha + \theta ret_i + \gamma f\left(age_i - \underline{age_i}\right) + \Gamma_i + \beta X_i + \varepsilon_i \qquad (1)$$

$$ret_i = \mu + \varphi default\_ret_i + v_i$$

where y_i denotes the outcome of interest for investor i, ret_i is the return (measured in APR as change in share price value) that person i experienced over the period March 2008 to June 2009 (the from reassignment to the end of the market crash) $f\left(age_i - \underline{age_i}\right)$ is a flexible function of

distance from the minimum age in each reassignment category, Γ_i are Afore-age-group fixed effects to control for the age group and baseline afore, and X_i are other personal baseline characteristics. The age groups are centered around the reassignment cutoffs. There are four age groups: 26.5 to 27.7 years with reassignment at 27, 36.5 to 37.7 years with reassignment at 37, 45.5 to 46.7 years with reassignment at 46 years, and 55.5 to 56.7 years with reassignment at 56 years. Thus the main second stage regression compares outcomes y_i between individuals in an Afore and age group as a function of differences in their returns experienced during the time period of interest. Because individuals in each age group span only two Seifores, any differences in the returns are driven by endogenous selection of Seifore based on risk preferences or exogenous variation due to reassignments at the introduction of the 5-fund system. Therefore we instrument for ret_i using only the returns of the default Seifore for their baseline (before default assignments) Afore to capture only the impact of exogenous variation in returns on outcomes of interest y_i. The first stage is strong as almost all individuals complied with their default assignments.

IV. Results

We start by looking at the impact of returns on stated risk preferences and financial literacy. Did large exposure to negative returns impact individual's risk preferences through learning about the negative sides of risk exposure? Did it prompt individuals to learn more about returns, risk, inflation and compounding? For all of our results, we split our sample by gender (male, female) because Mexican households often follow a traditional model with wives working within the home after childbearing, thus we may expect to find different impacts for men versus women. Within gender, we pool the impact of returns on the outcome variables for the youngest

two age groups and the oldest two age groups to increase statistical power (each regression still allows for full age group interactions with Afore fixed effects).

Table 5 shows the results from equation (1) where the dependent variable is a measure of risk exposure. Our measure of risk exposure is formed from responses to the following series of questions, where participants who choose the second option proceed to the next question until they reach Q4 whereas the game ends when participant chooses the first option:

Q1. *Suppose you have 1000 pesos to invest and you have the option to choose between 2 investments. The first one offers you to put the money in the bank and earn, with absolutely certainty, 5% of return at the end of one year. The second option offers you to invest the money in a mutual fund offering you a higher return, but with some risk. What would you choose: the first option to earn 5% with certainty or the second option that offers you the same probability of earn 30% of return or lose a 5%?*

Q2. *Suppose that now the second option offers you the same probability to earn 30% of return or lose 10% at the end of one year. What would you choose: the first option to earn 5% with certainty or this second option?*

Q3. *Suppose that now the second option offers you the same probability to earn 30% of return or lose 15% at the end of one year. What would you choose: the first option to earn 5% with certainty or this second option?*

Q4. *Suppose that now the second option offers you the same probability to earn 30% of return or lose 20% at the end of one year. What would you choose: the first option to earn 5% with certainty or this second option?*

The risk measure runs from 1 to 5, with a mean of 2.17 for younger and 2.15 for older workers, where a higher number implies less risk aversion. We find overall that women are more risk averse (have a lower number) than men, but the mean risk aversion is similar between younger and older workers with the same gender. Among older male workers, higher Siefore returns cause less risk aversion, implying that experiencing losses from the financial crisis would have caused higher risk aversion. This is the sub-population who would be primarily responsible for upcoming retirement resources for the family. In particular, a loss in returns of one percentage point (p.p.) as a result of reassignment would have decreased our risk preference measure (increased risk aversion) by 0.277, which 0.17 standard deviation away the mean score for this sub-population.

Tables 6-10 show the results from equation (1) where the dependent variables are various measures of financial literacy. The financial literacy measures are formed from responses to the following questions:

Q5.   *Suppose that you have 100 pesos in a savings account and the interest rate you earn for these savings is 2% per year. If you keep the money for 5 years in that account, how much money will you have at the end of these 5 years?* (where the answer options are a) less than 110 pesos, b) exactly 110 pesos and c) more than 110 pesos.)

Q6.   *Imagine that the annual interest rate of your savings account is 1% and the inflation annual rate is 2%. After one year, how much could you buy with the money in that account?* (where the answer options are a)less than I can buy today, b) the same as I can buy today, and c) more than I can buy today)

Q7.   *Suppose that 'AFORE A' had a return of 10% last year and the 'AFORE B' had a return of 7% last year. What AFORE will have the higher return next year?* (where the answer options are a) Afore A, b) both will have the same return, c)Afore B, and d) past return is not a guarantee of future performance)

Q8.   *In general, what of the next investments do you consider the riskier? (A) An investment in stocks of one company or (B) an investment in several stocks of different companies.* (where the answer options are a)Investment A, b)Both have same risk, and c)Investment B)

Table 6 shows the results where the dependent variable is a dummy that indicates understanding of interest rates and compounding (Q5). The percentage of participants who answered Q5 correctly was 46% for both the younger and older groups. However, younger females are more likely to answer correctly than older females. On the other hand, older males are more likely to answer correctly than younger males. Among younger males, experiencing higher returns makes workers significantly more likely to understand interest calculation. In particular, an increase in return of one p.p. increases probability of answering Q5 correctly by 0.19 standard deviations.

We do not find significant differences in probability of answering Q6 (inflation question) for any of the age or gender subgroups. Table 7 reports the results. Table 8 shows the results with the probability of answering Q7 (impact of past returns question) as the dependent variable. 61% of younger workers and 59% of older workers answered the question correctly. Overall, females were more likely to understand that past returns do not predict future performance than

males. Among both males and females, younger workers are slightly more likely to answer the question correctly. For older female workers, higher Siefore returns decrease probability of answering Q7 correctly, implying that experiencing losses would have increased probability of understanding the role of past returns. One would indeed expect workers who experienced a fall in returns earned due to the financial crash to realize that past returns do not predict future returns. A one p.p. loss in returns, as a result of reassignment would have increased the probability of answering Q7 correctly by 5.6 p.p. (~ 9% increase)- which is equivalent to 0.11 standard deviations above the mean among older female workers.

Table 9 shows the results with the probability of correctly answering Q8 as the dependent variable. 49% of younger workers and 43% of older workers answered Q8 (risk diversification question) correctly. Overall, females are less likely to understand risk than males. Younger males are much more likely to understand risk than older males (57% vs 48%). Younger females are also more likely to answer Q8 correctly than older females, however the difference is smaller (42% vs 39%). Lower siefore returns are associated with higher probability of understanding the importance of risk diversification among older males and among younger females. In particular, a loss in return of one p.p. would have increased probability of answering Q8 correctly by 0.17 standard deviations for older males, and by 0.23 standard deviations for younger females.

Table 10 shows the results from equation (1) where the dependent variable is an overall financial literacy score based on questions Q5-Q8. The financial literacy score has values ranging from 0 to 4, where a higher score indicates higher financial literacy and a lower score indicates lower financial literacy. The mean score is 2.35 for older workers and 2.24 for younger workers. Returns experienced by workers have no impact on overall financial literacy score, even though we did find some significant impacts for particular subgroups among the three questions likely to be impacted by changes in account returns and balances.

We are also interested in the question of how exposure to risk impacts knowledge of the social security system rules, and saving habits. Is there evidence that lower than expected balances caused individuals to learn more about the rules for the pension accounts. As in Tables 5-10 above, our sample is split by gender and within gender, results are pooled for the youngest two age groups and for the oldest two age groups (each regression still allows for full age group interactions with Afore fixed effects).

Tables 11-19 show the results from equation (1) where the dependent variables indicate knowledge of system characteristics and rules, such as knowledge of what a Siefore is, knowledge of the minimum contribution rate for pension eligibility, criteria for Unemployment Insurance withdrawal and so on. The measures of system knowledge are formed from responses to the following questions:

Q9.   *Do you know or have you heard about the SIEFORES?*

Q10.   *Could you tell me, inside an Afore, what is the main difference between Siefores?*

Q11.   *Thinking again in your current Afore, do you know what is the total percentage of your base salary that is addressed to your individual account monthly?*

Q12.   *Do you know, according to the current law, what is the minimum period of time that you have to been contributing to the pension system in order to get retired and receive an elderly pension under the new Afore system?*

Q13.   *Do you know, what is the minimum period of time that you must have been making contributions to the pension system to have access to this benefit (Unemployment benefit)?*

Q14.   *Do you know how much can you withdraw from your account because this benefit (Unemployment benefit)?*

Q15.   *If you are about to retire, but you don't fulfill the requirements to have access to an elderly pension under the new private Afore system or the old public IMSS system, what happens with the money in your Afore if you receive a 'refusal of pension'?*

Q16.   *Please, indicate if the next phrase is true or false: 'If you contributed to the pension system prior to 1997, you can choose between retire according the new private Afore system or the old public IMSS system'.*

Table 11 shows the results with the dummy for having heard of a Siefore as the dependent variable (Q9). We find no significant difference in the probability of having heard of a Siefore

due to change in returns earned for any subgroup. Table 12 shows the results of the impact of returns on probability of correctly knowing what a Siefore is (Q10). On average, 12.2% of younger workers and 10.6% of older workers know what the difference between Siefores is. Overall, females are less likely to answer Q10 correctly than males. Within older workers, this difference is more than 200% (4.2% for females vs 16.2% for males) while among younger workers, males are 40% more likely than females to answer the question correctly. We find a large, positive and significant impact of exposure to higher risk (fall in return) on the probability of knowing what a Siefore is among older female workers who had heard of the term Siefore. In particular, among older females, a loss in return of one p.p. as a result of reassignment would have increased probability of answering Q10 correctly by 3.7 p.p. (an 88% increase) – which is 0.18 standard deviations away from the mean.

Table 13 shows results with a dummy variable for knowledge of percentage of base salary that is contribute to individual Afore accounts as the dependent variable (Q11). We find no significant change in probability of answering Q11 correctly as a result of change in exposure to risk. Table 14 shows the results where the dependent variable is a dummy for answering Q12 correctly (the minimum number of contributions required for pension eligibility). One would expect older workers to be more likely to answer Q12 correctly as they are closer to retirement. Surprisingly, younger workers are more likely to answer the question correctly than older workers (15% vs 9.4%). Within older workers, females are more likely to know the minimum number of contributions required than males, while in the younger group, the probability among males and females is equal. We find a significant impact of returns on probability of knowing the contribution requirement for pension eligibility among older females. Higher Siefore returns lead to increased probability of knowledge of the minimum contribution requirements. A one p.p. increase in returns increases probability of answering Q12 correctly by 0.26 standard deviations among older females.

We find no significant difference in probability of knowledge of the criteria for Unemployment Insurance eligibility (Q13). Table 15 reports the results of the impact of returns on probability of answering Q13 correctly. However, as shown in Table 16, we find a significant impact of returns on probability of knowing the amount one can withdraw for Unemployment benefits (Q14) among older female workers. A one p.p. increase in returns leads to an increase in probability of answering Q14 by 0.18 standard deviations for older females. On average, 10% of younger workers and 16.6% of older workers know the amount one can withdraw as Unemployment benefits.

Table 17 shows the results of equation (1) where the dependent variable is a dummy variable indicating knowledge of what happens to funds in one's Afore account in case the requirements for pension eligibility are not met at time of retirement (Q15). We find no significant difference in probability of answering Q15 due to change in returns. Similarly, we do not find any significant impact of returns on the probability of knowing whether one can choose between the old and new Afore system if a worker has contributed to both (Q16). Table 18 presents the results of the impact on probability of answering Q16.

Based on questions Q11-Q16, we generated an overall SAR knowledge index which goes from 0 to 6, where a higher score indicates higher knowledge and a lower score indicates lower knowledge of system rules. We find no significant impact of returns on overall knowledge of SAR rules among any subsample. Table 19 presents the results.

We also examined the impact of exposure to lower returns as a result of default reassignment on saving habits other than the mandatory savings in one's Afore account. Tables 20-24 show the results from equation (1) where the dependent variables are measures of saving habits. Along with age group interactions with Afore fixed effects, the regressions shown in these set of tables also include control for daily wage as of March/April 2008 bimonthly period. The dependent variables are formed from responses to the following questions:

Q17.   In general, do you save Money (without including your obligatory savings through a pension/retirement account)?

Q18.   What do you save for? Save for retirement or to set up wealth?

Q19.   What are the 3 main ways that you use to save money, besides your obligatory account in the Afore? In a formal bank? In dollars or foreign currencies? In bonds? In stocks, trust funds or investment funds? or in voluntary savings account in Afore?

Q20.   What are the 3 main ways that you use to save money, besides your obligatory account in the Afore? In a formal bank?

Q21.   What of the next options are reasons why you don't save in a bank? You don't trust banks in Mexico?

Table 20 shows the results of equation (1) where the dependent variable is the probability of saving money in general apart from the obligatory savings in one's Afore account (Q17). We do not find a significant impact of returns on probability of saving money. Similarly, we do not find significant differences in the probability of saving money, besides mandatory savings in one's Afore, for retirement or to set up wealth (Q18). Table 21 presents the results.

Table 22 shows the results with a dummy for saving money in formal banks or in other sophisticated financial instruments (Q19) as the dependent variable. 54.9% of younger workers and 46.4% of older workers save in formal banks or in financial instruments such as stocks, bonds or in foreign currencies. Within older workers, males are slightly more likely to save in formal instruments than females (48% vs. 44%) , while on the other hand, younger females are slightly more likely to save in formal instruments than younger males. Among older females, we find that higher Siefore returns increase the probability of saving in formal instruments suggesting that those who experienced losses are less likely to save in banks or formal instruments such as stocks, bonds etc. that are subject to market volatility. In particular, a one p.p. decrease in returns would have decreased probability of saving in formal instruments by 0.15 standard deviations for this subgroup.

Similarly, we find a significant and positive impact of higher returns on probability of saving in a formal bank (Q20) among older females as shown in Table 23. A one p.p decrease in returns is associated with a 6.9 p.p. decrease in probability of saving in a formal bank among older females-which is equivalently a decrease of 0.14 standard deviations. On average, 48.7% of younger workers save in a formal bank and 38.6% of older workers save in a formal bank. Within older workers, males are more likely than females to save in a formal bank, and within younger workers, females are more likely to save in a formal bank than males.

Participants who reportedly did not save in a formal bank were also asked for the reasons they did not save in a bank. One of the reasons provided was whether they did not trust Mexican banks. Table 24 shows the results where the dependent variable is a dummy for whether workers do not save in formal banks because of lack of trust in Mexican banks (Q21). We find no significant difference in the probability of answering affirmatively to Q21 due to difference in returns earned.

Another question we looked at was how exposure to higher risk (lower return) impacted stated dependence on social security for funding retirement. Tables 25-27 show results from equation (1) where the dependent variables are measures of dependence on Afore accounts for financing retirement. These variables are formed in response to the following questions:

Q22. *I will show you a list of different ways that people use to finance their retirement. May you tell me, what of the following do you think will be your THREE MOST IMPORTANT SOURCES OF FINANCIAL HELP in your retirement?* (where, answer options are-
a) With my Afore,
b)With my IMSS pension,
c) With the help from my children,
d) With the income from my properties,
e) With the income from my company or business,
f) With a private pension or a retirement savings account from my employer ,
g)With my own private individual savings,
h) With a Government pension (ISSSTE, CFE, PEMEX),
i) With local pension benefits ('food pension program'),
j) With other Government programs (Seguro Popular, Oportunidades), and
 k)Keep working at least part-time.)

Table 25 shows the results where the dependent variable is the probability of choosing

Afore funds among the top 3 sources of funding retirement (Q22). We find no significant impact of returns on the probability of choosing Afore funds among the top 3 sources. Table 26 shows the impact of returns on the probability of choosing Afore funds or IMSS pension among the top 3 retirement funding sources (Q22). 72.1% of younger workers and 81.3% of older workers reportedly would depend on Afore funds or IMSS pension for funding retirement. Younger males are more likely to choose these two options than younger females. On the other hand, the difference between the probability of choosing these two options between males and females within older workers is only one p.p. We find that among older females, higher Siefore returns leads to an increase in probability of choosing Afore funds or IMSS pension as retirement funding sources. This suggests that those who experience a fall in returns are less dependent on their pensions for financing retirement. In particular, among older females, a one p.p. decrease in returns is associated with a decrease in probability of choosing these options by 0.16 standard deviations.

Table 27 reports the results with the probability of choosing Afore funds or IMSS pension as the most important source of funding retirement (Q22) as the dependent variable. We find no significant difference in the probability of choosing these two options as the primary source for any subgroup.

Another question we were interested in was how exposure to risk impacts stated valuation of social security benefits. Table 28 and table 29 show the results from equation (1) where the dependent variables are measures of Afore account valuation. These measures are formed from responses to the following questions:

Q24: *Suppose that you have a job without IMSS benefits. Your employer is thinking about add them, but to do it he will need to reduce your salary to be able to pay them. What fraction of your salary would you willing to contribute for your employer give you IMSS benefits?*

Q25: *Suppose that your boss asks you if you would like to deduct your salary in 2% each month to deposit this amount in this savings fund. What would you answer?* (where answer options are- 1)

Yes, I want to deduct 2%, 2) No, I want to keep the 2% of my current salary to do with it now what I decide)

Q26: *Suppose that your boss asks you if you would like to deduct your salary in 2% each month to deposit this amount in this savings fund. If you accept, your employer will deposit in the account, additionally, another 1% of your salary as an incentive to you and without any cost to you. Therefore, if you contribute today with 2% of your salary, in total 3% of your salary will go to your savings fund for retirement. What would you answer?* (where answer options are- 1) Yes, I want to deduct 2%, 2) No, I want to keep the 2% of my current salary to do with it now what I decide)

Table 28 shows the results where the dependent variable is the fraction of salary worker is willing to forgo for IMSS benefits (Q24). We find no significant impact of returns on the fraction of salary workers are willing give up to receive IMSS benefits. Table 29 shows the results where the dependant variable is a dummy variable indicating whether a worker would require additional contribution from his or her employer in order to be willing to contribute 2% of his or her salary in an Afore account (Q25 & Q26). 11% of younger workers and 17.5% of older workers said that they would be willing to deduct 2% of their salary for Afore savings only if their employer extra contribution. Within older workers, females were more likely to say that they would need extra contribution from employers than males (19% vs 16%), whereas among younger workers, females and males were equally likely to require additional contribution in order to deduct 2% of their salary for Afore savings. We find that among younger females, lower Siefore returns is associated with an increase in the probability of requiring additional contribution suggesting a negative impact of exposure to risk on Afore account valuation among this group. In particular, a one p.p. decrease in returns would increase probability of requiring additional contribution by 0.27 standard deviations.

Lastly, we examined the impact of exposure to risk on workers' labor supply. Using individual administrative records on labor history during our time period of interest, we examine the impact of change in returns due to reassignment on 1) total number of days worked from May 2008 to June 2009 (during the crash) , and 2) total number of days from July 2009 to

October 2009 (after the crash). We split our regression sample by the four age groups around

Siefore reassignment ages, and within each age group, we further split the samples by gender.

Panel A of Table 30 shows the impact of returns on days worked during the market crash.

Overall, females worked fewer days than males. This difference increases as we go from the

oldest age group to the youngest age group. The mean number of days worked was 192.8 days

among the oldest age group (55-56 years), 203.8 days among 45-46 year olds, 189.3 days among

36-37 year olds, and 168.2 days among 26-27 year olds. We find that higher Siefore returns

caused fewer number of days worked during the market crash among males in the two oldest age

groups and for all workers in the youngest age group. This implies that those who experienced a

fall in returns would have worked more during the crash. A one p.p. decrease in returns is

associated with a small increase in days worked by 0.003 standard deviations for 55-56 year old

males and by 0.008 standard deviations for 45-46 year old males. For 26-27 year old females, a

one p.p. decrease in returns would have increased number of days worked by 0.005 standard

deviations and by 0.004 standard deviations for males in the same age group.

Panel B of Table 30 reports the results of the impact of returns on days worked in the four

month period after the crash, from July to October 2009. Similar to the pattern for days worked

during the crash, workers in the 46-47 year old group worked the most number of days with an

average of 54.2 days while those in the youngest group worked the least number of days with an

average of 45.2 days. Females worked fewer days than males overall, and this difference was

more pronounced for the youngest age groups. We find that higher Siefore returns caused fewer

days worked post market crash among males in the oldest age group, and among females in the

45-46 year old and 26-27 year old age groups. A one p.p. decrease in returns as a result of

reassignment is associated with an increase in post-crash days worked by 0.04 standard

deviations for 55-56 year old males. Similarly, a one p.p. decrease in returns would have

increased days worked for 45-46 year old females by 0.01 standard deviations, and by 0.007 standard deviations among 26-27 year old females.

Overall we expected if higher returns increased the value individuals placed on the Afore account, and the degree to which they plan to depend on it for retirement, then we would find higher returns lead to a higher number of days worked in the formal sector in line with an increased value of social security benefits. However we find the opposite. This may be because lower returns decreased the ability for many workers to access unemployment insurance benefits from their account, or decreased the insurance benefit they could withdraw. This would cause an inverse relationship between days worked and returns as those with low returns or losses would work on average more days as they could not withdraw as much on average for unemployment insurance benefits.

IV.   Conclusions and Directions for Future Research

We examine the impact of exposure to investment risk during the financial downturn on financial literacy, risk preferences, knowledge of pension rules and valuation of pension accounts in Mexico's privatized social security market. We use arguably exogenous variation in returns generated by the default reassignment of workers to a new 5-fund system with increased risk for younger workers that coincided with the market crash. We use a new linked survey and administrative data set of account holders in the privatized system to estimate the causal relationship between behavior, knowledge and returns.

Overall, we find some evidence that returns caused an increase in financial knowledge among subgroups in the population. We find increases in risk aversion for older male workers who experienced lower returns. We find some evidence that younger male workers were more able to answer compound interest questions in the Big 3 financial literacy battery correctly if they had lower returns. Older male workers and younger female workers were also more likely to

understand risk and diversification concepts if they were exposed to lower returns. We find some evidence among older female workers that higher returns increased knowledge of retirement rules in the system, suggesting that larger account balances cause them to find out the rules governing use of the pension account. We also find that higher returns caused older women to say that they use banks and investment vehicles to save (as opposed to informal savings mechanisms popular in Mexico), and to say that they will depend on their Afore account as one of their primary sources for financing their retirement. Interestingly, we do not find that increased returns increase formal sector participation. We find the opposite for men, suggesting that the impact of increased unemployment insurance benefit withdrawal with increased returns outweighed an increased incentive to work in the formal sector for the savings benefits during the economic downturn.

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Table 1: Description of AFORES in Our Sample Period, March 2008 to December 2009

Afore Name	Entry	Exit	Firm Description and Brand Perception
Afirme Bajío	Dec-05		Mexican financial group
Ahorra Ahora	Aug-06	Aug-09	Owned by Mexican financial group Monex
Argos	Dec-06	Dec-10	Mexican insurance company affiliated with international insurance company Aegon
Azteca	Mar-03		Grupo Salinas (owns Elektra retailer for low- to middle-income WHAT and TV chain Azteca)
Banamex	Jul-97		Large Mexican bank (since 1884), bought by Citigroup (2001)
Bancomer	Jul-97		Large Mexican bank (since 1932), affiliated to Spanish Bank (in 2000)
Banorte Generali	Jul-97		Northern Mexican bank affiliated with International Insurance Company Generali
Coppel	Apr-06		Mexican leading departmental store for low- to middle-income WHAT
HSBC	Jul-97		International Bank
Inbursa	Jul-97		Banking and financial services group, owned by Carlos Slim
ING	Jul-97		International financial group
Invercap	Feb-05		Mexican mutual funds administrator founded in the north of Mexico
IXE	Jun-04	Jun-09	Mexican financial group
Metlife	Feb-05		International insurance company
Principal	Jul-97		International financial group
Profuturo GNP	Jul-97		Mexican mutual funds administrator
Scotia	Nov-06	Jan-10	International banking and financial services company
XXI	Jul-97		Owned by IMSS (former pension system administrator) and Prudential

Table 2: Fraction of Investment Funds in Equity Indexes by Afore and Seifore, Pre and Post Reform

| Afore | February 2008 | | April 2008 | | | | |
	Siefore 1	Siefore2	Siefore 1	Siefore 2	Siefore 3	Siefore 4	Siefore 5
Afirme Bajío	0.00	4.22	0.00	11.89	11.87	13.90	12.06
Ahorra Ahora	0.00	7.82	0.00	11.65	11.79	12.50	14.99
Argos	0.00	4.42	0.00	4.92	5.03	4.53	9.95
Azteca	0.00	11.16	0.00	0.00	0.90	0.93	1.55
Banamex	0.00	16.30	0.00	13.47	16.35	20.53	22.90
Bancomer	0.00	10.95	0.00	12.50	15.99	19.66	23.45
Banorte Generali	0.00	14.24	0.00	11.98	16.01	19.39	22.55
Coppel	0.00	8.70	0.00	10.37	15.32	17.38	21.40
HSBC	0.00	8.04	0.00	8.31	9.44	10.37	10.69
Inbursa	0.00	7.12	0.00	6.79	8.63	9.32	8.32
ING	0.00	13.45	0.00	11.70	15.25	18.76	21.85
Invercap	0.00	13.61	0.00	14.47	18.43	22.85	26.43
IXE	0.00	16.28	0.00	14.49	18.43	22.83	27.07
MetLife	0.00	13.42	0.00	13.16	15.07	18.63	22.51
Principal	0.00	11.89	0.00	10.86	14.27	17.88	20.10
Profuturo GNP	0.00	6.43	0.00	13.80	18.18	23.11	27.84
Scotia	0.00	14.19	0.00	11.24	14.09	15.90	19.87
XXI	0.00	8.58	0.00	8.80	9.83	10.78	12.66

Notes: Calculations by author based on investment category data from CONSAR.

Table 3: 1 year returns in % as of end of June 2009

Afore	SB 1	SB 2	SB 3	SB 4	SB 5
Afirme Bajio	6.44	7.03	6.97	6.23	6.81
Ahorra Ahora	5.34	-0.34	-1.11	-3.30	-2.06
Argos	8.44	8.29	8.77	9.82	8.48
Azteca	6.36	7.72	6.79	7.53	4.32
Banamex	12.79	4.93	4.42	3.98	4.05
Bancomer	7.84	4.09	3.43	1.82	1.67
Banorte Generali	1.29	4.46	1.56	2.25	1.81
Coppel	5.81	3.63	2.95	3.92	3.09
HSBC	7.83	7.13	7.28	6.64	6.17
Inbursa	8.32	6.91	6.36	4.93	4.24
ING	12.31	8.87	8.52	7.70	5.62
Invercap	3.55	0.83	0.18	-1.93	0.37
IXE**	5.83	-2.16	-1.36	-3.17	-3.10
Metlife	8.99	4.82	3.34	2.06	2.55
Principal	8.94	6.13	4.97	3.53	2.23
Profuturo GNP	5.68	6.18	7.80	6.99	2.06
Scotia	10.67	8.91	7.39	7.05	7.81
XXI	11.71	10.32	8.85	7.51	7.21

***Returns for IXE are 1 year returns as of end of May 2009*.

Table 4: SUMMARY STATISTICS FOR THE EERA SAMPLE

	1 **Mean for all SAR account holders in Distrito Federal**	2 **Mean for EERA sample**	3 **Unweighted difference in means**	4 **Weighted difference in means**
Age	37.71	36.38	-1.328***	0.1576
	(9.45)	(10.7)	(0.115)	(0.131)
Fraction Male	0.56	0.51	-0.045***	-0.0107
	(0.5)	(0.5)	(0.006)	(0.0075)
Monthly salary	8422.64	7824.37	-598.278***	108.6918
	(9711.09)	(8994.91)	(115.455)	(160.3257)
RCV account balance as of October 2009	41135.74	37391.43	-3,744.311***	143.0279
	(66364.73)	(64721.19)	(799.15)	(975.4121)
Years in Afore as of survey	6.09	4.07	-2.014***	0.0225
	(4.35)	(3.67)	(0.051)	(0.0747)
Years in SAR	9.34	7.97	-1.373***	0.0557
	(3.28)	(3.88)	(0.04)	(0.0435)
Years since last contribution	2.36	1.51	-0.844***	-0.067
	(3.41)	(2.61)	(0.04)	(0.0689)
Fraction in Afore XXI	0.09	0.18	0.085***	0.0004
	(0.29)	(0.38)	(0.004)	(0.0031)
Fraction in Afore ING	0.16	0.08	-0.081***	-0.0052
	(0.37)	(0.27)	(0.004)	(0.0069)

*Standard errors in parentheses *** p<0.01, **p<0.05, * p<0.1*

Table 5: Risk Preference

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	**Male**	**Female**	**Male**
Returns earned over March 2008- June 2009 (%)	-0.0218	0.277**	-0.154	0.0730
	(0.109)	(0.128)	(0.175)	(0.155)
High school complete, but no college degree	0.943***	0.0251	0.254	0.802***
	(0.294)	(0.329)	(0.210)	(0.220)
Has college degree	1.115***	0.652**	0.565**	1.130***
	(0.291)	(0.323)	(0.231)	(0.219)
Constant	-0.259	-0.781	3.810***	1.376
	(0.924)	(1.069)	(1.199)	(1.003)
Observations	143	174	277	286
Mean dep var	1.839	2.420	1.874	2.448
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Table 6: Answered Interest Question Correctly

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	**Male**	**Female**	**Male**
Returns earned over March 2008- June 2009 (%)	0.0545	0.00843	-0.0633	0.0996*
	(0.0380)	(0.0381)	(0.0639)	(0.0519)
High school complete, but no college degree	-0.102	0.146	-0.133*	0.0771
	(0.103)	(0.0977)	(0.0766)	(0.0735)
Has college degree	-0.0934	0.382***	-0.0430	0.126*
	(0.102)	(0.0959)	(0.0844)	(0.0731)
Constant	-0.285	-0.342	0.628	-0.255
	(0.322)	(0.317)	(0.439)	(0.336)
Observations	143	174	278	286
Mean dep var	0.420	0.500	0.464	0.455
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Table 7: Answered Inflation Question Correctly

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.0454	-0.00574	0.0893	-0.0273
	(0.0295)	(0.0254)	(0.0604)	(0.0454)
High school complete, but no college degree	0.129	0.0147	0.161**	0.101
	(0.0797)	(0.0652)	(0.0725)	(0.0644)
Has college degree	0.194**	0.138**	0.188**	0.167***
	(0.0788)	(0.0640)	(0.0798)	(0.0640)
Constant	1.155***	0.859***	0.427	1.011***
	(0.250)	(0.212)	(0.415)	(0.294)
Observations	143	174	278	286
Mean dep var	0.846	0.879	0.647	0.706
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table 8: Answered past returns question correctly

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.0561*	0.0200	0.0554	0.00568
	(0.0340)	(0.0358)	(0.0597)	(0.0472)
High school complete, but no college degree	0.496***	0.281***	0.296***	0.247***
	(0.0918)	(0.0918)	(0.0716)	(0.0669)
Has college degree	0.450***	0.580***	0.380***	0.228***
	(0.0908)	(0.0901)	(0.0789)	(0.0665)
Constant	0.382	0.193	0.366	0.640**
	(0.288)	(0.298)	(0.410)	(0.305)
Observations	143	174	278	286
Mean dep var	0.608	0.575	0.626	0.598
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Table 9: Answered risk diversification question correctly

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	**Male**	**Female**	**Male**
Returns earned over March 2008- June 2009 (%)	0.0619	-0.0856**	-0.113*	0.0157
	(0.0382)	(0.0391)	(0.0676)	(0.0487)
High school complete, but no college degree	0.0148	0.0556	0.0511	0.0841
	(0.103)	(0.100)	(0.0812)	(0.0691)
Has college degree	0.306***	0.0894	0.167*	0.299***
	(0.102)	(0.0984)	(0.0894)	(0.0687)
Constant	-0.205	1.526***	1.443***	-0.0217
	(0.324)	(0.325)	(0.465)	(0.315)
Observations	143	174	278	286
Mean dep var	0.392	0.477	0.417	0.566
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Table 10: Financial Literacy Score (0 to 4)

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.0149	-0.0629	-0.0316	0.0937
	(0.0740)	(0.0721)	(0.116)	(0.0992)
High school complete, but no college degree	0.538***	0.497***	0.375***	0.509***
	(0.200)	(0.185)	(0.140)	(0.141)
Has college degree	0.856***	1.189***	0.692***	0.819***
	(0.198)	(0.181)	(0.154)	(0.140)
Constant	1.047*	2.237***	2.863***	1.374**
	(0.628)	(0.599)	(0.800)	(0.642)
Observations	143	174	278	286
Mean dep var	2.266	2.431	2.155	2.325
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

Table 11: HEARD OF SIEFORE

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.0144	0.00488	-0.0260	0.0432
	(0.0342)	(0.0359)	(0.0539)	(0.0446)
High school complete, but no college degree	0.0105	0.0708	0.149**	0.154**
	(0.0925)	(0.0920)	(0.0647)	(0.0631)
Has college degree	0.202**	0.367***	0.242***	0.321***
	(0.0915)	(0.0903)	(0.0712)	(0.0628)
Constant	0.107	0.632**	0.364	-0.0310
	(0.290)	(0.299)	(0.371)	(0.288)
Observations	0.224	0.397	0.252	0.325
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.0369**	0.0133	-0.00341	-0.0163
	(0.0168)	(0.0274)	(0.0378)	(0.0346)
High school complete, but no college degree	0.0863*	-0.0805	0.121***	0.0940*
	(0.0454)	(0.0705)	(0.0451)	(0.0491)
Has college degree	0.125***	0.237***	0.149***	0.207***
	(0.0449)	(0.0695)	(0.0497)	(0.0488)
Constant	0.0404	-0.00358	0.0103	0.00253
	(0.143)	(0.228)	(0.260)	(0.224)
Observations	0.0420	0.162	0.101	0.143
Mean dep var	143	173	277	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 13: KNOWS % BASE SALARY THAT GOES INTO AFORE ACCOUNT

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.00691	-0.00626	-0.00361	0.0259
	(0.00727)	(0.0130)	(0.0275)	(0.0219)
High school complete, but no college degree	0.0226	-0.00298	-0.0187	-0.0450
	(0.0197)	(0.0334)	(0.0329)	(0.0310)
Has college degree	0.00771	0.0640*	-0.0682*	0.0166
	(0.0194)	(0.0328)	(0.0363)	(0.0308)
Constant	0.0201	-0.0128	0.175	-0.129
	(0.0617)	(0.108)	(0.189)	(0.142)
Observations	0.00699	0.0345	0.0504	0.0455
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 14: KNOWS MINIMUM PERIOD OF TIME YOU MUST CONTRIBUTE TO RECEIVE PENSION

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.08261***	-0.00349	-0.04491	-0.01657
	(0.026)	(0.021)	(0.047)	(0.035)
High school complete, but no college degree	-0.0143	-0.0693	0.103*	0.00715
	(0.0692)	(0.0542)	(0.0560)	(0.0498)
Has college degree	-0.0223	0.0514	0.0403	-0.0114
	(0.0685)	(0.0532)	(0.0617)	(0.0495)
Constant	-0.42334*	0.22318	0.51251	-0.02357
	(0.217)	(0.176)	(0.321)	(0.227)
Observations	0.11	0.08	0.15	0.15
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 15: KNOWS CRITERIA FOR UI ELIGIBILITY

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.0280	-0.00795	0.00829	-0.00967
	(0.0172)	(0.0148)	(0.0215)	(0.0270)
High school complete, but no college degree	-0.0312	0.0217	-0.0159	0.0445
	(0.0466)	(0.0378)	(0.0258)	(0.0383)
Has college degree	-0.0142	0.0576	-0.0328	0.110***
	(0.0461)	(0.0371)	(0.0285)	(0.0380)
Constant	-0.00482	0.00950	-0.0816	0.0286
	(0.146)	(0.123)	(0.148)	(0.175)
Observations	0.0420	0.0402	0.0288	0.0769
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 16: KNOWS AMOUNT THAT CAN BE WITHDRAWN FOR UI BENEFITS

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.06194**	-0.01299	-0.00100	-0.00222
	(0.029)	(0.029)	(0.039)	(0.031)
High school complete, but no college degree	-0.105	0.0921	-0.00467	0.00203
	(0.0797)	(0.0753)	(0.0468)	(0.0439)
Has college degree	-0.127	0.248***	0.108**	-0.0264
	(0.0788)	(0.0739)	(0.0515)	(0.0437)
Constant	0.17626	0.02261	0.05138	0.19202
	(0.250)	(0.244)	(0.268)	(0.200)
Observations	0.14	0.19	0.10	0.10
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	*Y*	*Y*	*Y*	*Y*
AforeXgroup fixed effects	*Y*	*Y*	*Y*	*Y*

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 17: KNOWS WHAT HAPPENS TO FUNDS IF REQUIREMENTS TO RETIRE ARE NOT MET

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.03018	0.00837	0.03818	-0.02845
	(0.039)	(0.039)	(0.056)	(0.049)
High school complete, but no college degree	0.174*	0.0662	0.180***	-0.00112
	(0.106)	(0.0998)	(0.0666)	(0.0688)
Has college degree	0.309***	0.0976	0.231***	0.0636
	(0.105)	(0.0979)	(0.0734)	(0.0684)
Constant	0.50654	0.49223	0.31495	0.82976***
	(0.332)	(0.324)	(0.382)	(0.314)
Observations	0.58	0.55	0.68	0.66
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	*Y*	*Y*	*Y*	*Y*
AforeXgroup fixed effects	*Y*	*Y*	*Y*	*Y*

TABLE 18: KNOWS WHETHER YOU CAN CHOOSE BETWEEN 2 SYSTEMS IF CONTRIBUTED TO BOTH

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.04317	-0.00136	0.08085	-0.00951
	(0.040)	(0.035)	(0.062)	(0.049)
High school complete, but no college degree	0.265**	-0.101	0.238***	0.168**
	-0.107	-0.0898	(0.0741)	(0.0691)
Has college degree	0.257**	0.258***	0.339***	0.253***
	-0.106	-0.0881	(0.0816)	(0.0688)
Constant	0.44378	0.94171***	-0.07576	0.68043**
	(0.337)	(0.291)	(0.424)	(0.316)
Observations	0.57	0.64	0.54	0.51
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 19: SAR KNOWLEDGE SCORE

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.09230	-0.02368	0.07780	-0.04048
	(0.084)	(0.070)	(0.124)	(0.101)
High school complete, but no college degree	0.311	0.00673	0.482***	0.175
	(0.226)	(0.180)	(0.149)	(0.144)
Has college degree	0.410*	0.776***	0.617***	0.405***
	(0.224)	(0.176)	(0.164)	(0.143)
Constant	0.71853	1.67647***	0.89623	1.57814**
	(0.710)	(0.583)	(0.851)	(0.656)
Observations	1.45	1.54	1.56	1.56
Mean dep var	143	174	278	286
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 20: SAVES MONEY IN GENERAL

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.04028	-0.00501	-0.06659	-0.02975
	(0.043)	(0.042)	(0.058)	(0.044)
High school complete, but no college degree	0.0313	-0.0250	0.0255	0.146**
	(0.112)	(0.0992)	(0.0730)	(0.0628)
Has college degree	0.180	0.0926	0.00884	0.151**
	(0.116)	(0.106)	(0.0902)	(0.0641)
Daily wage as of March/April 2008	0.000159	0.000268**	-0.000113	1.25e-05
	(9.91e-05)	(0.000129)	(0.000163)	(2.71e-05)
Constant	0.49696	0.65779**	1.12408***	0.69640**
	(0.381)	(0.317)	(0.400)	(0.283)
Observations	0.58	0.65	0.78	0.75
Mean dep var	129	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 21: SAVES MONEY FOR RETIREMENT OR TO SET UP WEALTH

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.00024	-0.00430	-0.09181	-0.05591
	(0.042)	(0.043)	(0.067)	(0.050)
High school complete, but no college degree	0.0361	0.138	0.00861	0.183**
	(0.109)	(0.102)	(0.0849)	(0.0718)
Has college degree	0.246**	0.208*	0.0873	0.230***
	(0.113)	(0.110)	(0.105)	(0.0733)
Daily wage as of March/April 2008	0.000211**	0.000101	-0.000152	4.13e-05
	(9.64e-05)	(0.000133)	(0.000190)	(3.10e-05)
Constant	0.67587*	0.80871**	1.18169**	0.92463***
	(0.371)	(0.327)	(0.466)	(0.324)
Observations	0.48	0.52	0.63	0.63
Mean dep var	129	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 22: SAVES MONEY IN FORMAL BANKS OR FINANCIAL INSTRUMENTS

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.07270*	-0.04238	-0.05339	-0.06109
	(0.041)	(0.041)	(0.064)	(0.048)
High school complete, but no college degree	0.168	0.0507	-0.0397	0.305***
	(0.108)	(0.0972)	(0.0809)	(0.0692)
Has college degree	0.282**	0.246**	0.178*	0.410***
	(0.111)	(0.104)	(0.1000)	(0.0707)
Daily wage as of March/April 2008	0.000128	0.000367***	2.08e-05	2.95e-05
	(9.53e-05)	(0.000126)	(0.000181)	(2.99e-05)
Constant	-0.32774	0.62010**	0.98089**	0.36693
	(0.366)	(0.311)	(0.444)	(0.312)
Observations	0.44	0.48	0.57	0.53
Mean dep var	129	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 23: SAVES IN A BANK

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.06870*	-0.03546	-0.03298	-0.03233
	(0.039)	(0.040)	(0.064)	(0.048)
High school complete, but no college degree	0.225**	-0.108	-0.0445	0.325***
	(0.101)	(0.0953)	(0.0813)	(0.0694)
Has college degree	0.256**	0.113	0.218**	0.349***
	(0.104)	(0.102)	(0.100)	(0.0709)
Daily wage as of March/April 2008	0.000156*	0.000351***	-1.86e-05	6.18e-06
	(8.88e-05)	(0.000124)	(0.000182)	(3.00e-05)
Constant	-0.32226	0.56300*	0.77085*	0.30161
	(0.342)	(0.305)	(0.446)	(0.313)
Observations	0.37	0.39	0.51	0.47
Mean dep var	129	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 24: DOES NOT SAVE IN A BANK BECAUSE OF LACK OF TRUST IN MEXICAN BANKS

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.01955	0.02953	-0.00004	0.01053
	(0.025)	(0.026)	(0.044)	(0.034)
High school complete, but no college degree	-0.104	0.104*	0.0243	-0.0587
	(0.0689)	(0.0619)	(0.0563)	(0.0492)
Has college degree	-0.152**	-0.00562	-0.130*	-0.0712
	(0.0711)	(0.0664)	(0.0696)	(0.0503)
Daily wage as of March/April 2008	6.98e-05	-0.000119	-5.95e-05	-8.47e-06
	(6.04e-05)	(8.03e-05)	(0.000126)	(2.12e-05)
Constant	0.59694***	0.16076	0.00411	0.10598
	(0.222)	(0.198)	(0.309)	(0.222)
Observations	0.11	0.10	0.15	0.14
Mean dep var	130	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

TABLE 25: AFORE FUNDS IS TOP 3 SOURCE OF FINANCING RETIREMENT

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.05728	0.03231	-0.10184	-0.01304
	(0.045)	(0.043)	(0.068)	(0.050)
High school complete, but no college degree	0.0582	0.111	-0.0393	-0.0120
	(0.125)	(0.102)	(0.0864)	(0.0718)
Has college degree	0.0480	0.0408	-0.195*	0.0628
	(0.129)	(0.110)	(0.106)	(0.0733)
Daily wage as of March/April 2008	-9.82e-05	-2.01e-05	0.000492**	2.78e-05
	(0.000109)	(0.000133)	(0.000195)	(3.10e-05)
Constant	-0.00271	0.34044	0.69413	0.12208
	(0.402)	(0.327)	(0.474)	(0.324)
Observations	0.47	0.48	0.47	0.53
Mean dep var	129	163	249	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 26: **AFORE FUNDS OR IMSS** IS TOP 3 SOURCE OF FINANCING RETIREMENT

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.06489*	-0.03412	0.00719	-0.04901
	(0.034)	(0.030)	(0.058)	(0.045)
High school complete, but no college degree	0.0871	0.102	-0.0847	-0.0527
	(0.0937)	(0.0721)	(0.0731)	(0.0641)
Has college degree	-0.0234	0.0206	-0.235***	0.0257
	(0.0968)	(0.0774)	(0.0904)	(0.0655)
Daily wage as of March/April 2008	-0.000199**	6.21e-05	0.000184	4.01e-05
	(8.22e-05)	(9.36e-05)	(0.000164)	(2.77e-05)
Constant	0.41776	1.08231***	0.63584	0.67058**
	(0.302)	(0.231)	(0.401)	(0.289)
Observations	0.82	0.83	0.70	0.75
Mean dep var	130	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 27: AFORE FUNDS OR IMSS IS 1st SOURCE OF FINANCING RETIREMENT

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.01386	-0.00165	0.06788	-0.04474
	(0.043)	(0.045)	(0.064)	(0.049)
High school complete, but no college degree	0.0740	0.0157	-0.0579	-0.0193
	(0.119)	(0.106)	(0.0818)	(0.0701)
Has college degree	-0.0922	-0.0722	-0.255**	-0.137*
	(0.123)	(0.113)	(0.101)	(0.0716)
Daily wage as of March/April 2008	-6.07e-05	0.000108	0.000252	7.29e-05**
	(0.000105)	(0.000137)	(0.000183)	(3.03e-05)
Constant	0.06597	0.96133***	0.02452	0.21377
	(0.385)	(0.337)	(0.449)	(0.316)
Observations	0.53	0.48	0.39	0.38
Mean dep var	130	163	251	273
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 28: FRACTION OF SALARY WILLING TO FORGO FOR IMSS BENEFITS

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	0.92557	0.94109	-0.60672	1.18299
	(0.792)	(0.919)	(1.239)	(0.768)
High school complete, but no college degree	-1.079	0.625	-2.792*	-0.545
	(2.131)	(2.190)	(1.552)	(1.114)
Has college degree	2.378	0.438	-2.802	-1.438
	(2.140)	(2.385)	(1.906)	(1.142)
Daily wage as of March/April 2008	0.00142	-0.00434	0.00114	-0.000520
	(0.00192)	(0.00290)	(0.00350)	(0.000479)
Constant	3.58365	-0.52558	13.66972	1.11161
	(7.480)	(6.991)	(8.643)	(4.998)
Observations	8.44	8.12	9.04	8.93
Mean dep var	120	161	244	271
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

TABLE 29: NEED EXTRA CONTRIBUTION FROM EMPLOYER TO DEDUCT 2% SALARY FOR AFORE SAVINGS

	I.	II	III	IV
	Older workers		**Younger workers**	
	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.00479	0.00527	-0.08939*	-0.00039
	(0.036)	(0.035)	(0.046)	(0.032)
High school complete, but no college degree	-0.188**	-0.158**	-0.0534	0.0272
	(0.0908)	(0.0782)	(0.0600)	(0.0444)
Has college degree	-0.205**	-0.0540	-0.00105	-0.0230
	(0.0930)	(0.0862)	(0.0738)	(0.0452)
Daily wage as of March/April 2008	0.000118	3.31e-05	-0.000180	1.61e-06
	(7.80e-05)	(9.90e-05)	(0.000133)	(1.90e-05)
Constant	0.21889	0.39343	0.59405*	0.27154
	(0.291)	(0.271)	(0.324)	(0.199)
Observations	0.19	0.16	0.11	0.11
Mean dep var	124	158	246	266
Controls for distance from youngest age in group	Y	Y	Y	Y
AforeXgroup fixed effects	Y	Y	Y	Y

TABLE 30: NUMBER OF DAYS WORKED

PANEL A: # DAYS WORKED MAY 08 - JUN 09	Group 1		Group 2		Group 3		Group 4	
	Female	Male	Female	Male	Female	Male	Female	Male
Returns earned over March 2008- June 2009 (%)	-0.11887	-0.51542*	-1.04882	-1.60045**	0.36004	0.02256	-1.00245***	-0.70118**
	(0.469)	(0.305)	(0.903)	(0.672)	(0.876)	(0.706)	(0.337)	(0.311)
Constant	165.25788***	223.27827***	322.79461***	300.25718***	263.58440***	252.60014***	187.98450***	197.71871***
	(3.830)	(2.842)	(5.928)	(4.580)	(5.016)	(4.081)	(1.921)	(1.790)
Mean days worked May08-Jun09	189.35	196.29	200.61	207.01	174.54	204.05	146.45	189.91
N	72208	173787	188596	347300	365360	578258	548172	705016

PANEL B: # DAYS WORKED JULY 09 - OCT 09								
Returns earned over March 2008- June 2009 (%)	-0.06084	-0.21289**	-0.59428**	-0.32602	0.02957	-0.00574	-0.36472***	-0.15265
	(0.137)	(0.090)	(0.268)	(0.201)	(0.260)	(0.213)	(0.101)	(0.095)
Constant	40.99086***	56.84549***	88.40452***	80.82644***	73.85261***	69.17120***	51.65368***	53.79278***
	(1.117)	(0.839)	(1.761)	(1.373)	(1.488)	(1.228)	(0.574)	(0.546)
Mean days worked Jul09-Oct09	49.69	51.25	53.35	55.07	47.08	54.86	39.12	51.36
N	72208	173787	188596	347300	365360	578258	548172	705016

*Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1*

APPENDIX I

Figure 3: Summary of Investments Limits by each type of SIEFORE

This document is a summary of the applicable regulation and it should be used only as a guide of the investment regime. The applicable regulation might have change since it was last updated. This document does not substitute, add nor modify the applicable regulation; making it public does not bind CONSAR nor any other participant in the Retirement Savings System (SAR).
Last update: Circular 15-23; August 3rd, 2009

		Limits by kind of SIEFORE (fund)[1]				
		1	2	3	4	5
Market Risk	Value at Risk [VaR$_{historical}$ (1-α=95%,1day)]	0.6%	1.0%	1.3%	1.6%	2.0%
	Equity (only through indices)	0%	15%	20%	25%	30%
	Foreign Currency *(Dollars, Euros, Yens or currencies to acquire equity)*	30%	30%	30%	30%	30%
	Derivatives	Yes	Yes	Yes	Yes	Yes
Credit Risk	mxAAA[2] and Government securities	100%	100%	100%	100%	100%
	mxAA - rated securities	50%	50%	50%	50%	50%
	mxA - rated securities	20%	20%	20%	20%	20%
Concentration/ Counterparty Risk — Local Securities	mxAAA rated securities from one issuer[3] or counterpart	5%	5%	5%	5%	5%
	mxAA rated securities from one issuer or counterpart	3%	3%	3%	3%	3%
	mxA rated securities from one issuer or counterpart	1%	1%	1%	1%	1%
	BBB+ rated sec. denominated in foreign currency from one issuer	5%	5%	5%	5%	5%
	BBB- rated sec. denominated in foreign currency from one issuer	3%	3%	3%	3%	3%
For.	A- rated foreign securities from one issuer or counterpart	5%	5%	5%	5%	5%
	Maximum ownership of one issue[4]	20% for all the Siefores operated by a pension Funds Administrator (AFORE)				
Other Limits	Foreign securities (if fixed income, minimum rate is A-)	20%	20%	20%	20%	20%
	Securitizations[5]	10%	15%	20%	30%	40%
	Structured securities (issued by Mexican nationals)[5]	0%	5%	10%	10%	10%
	REITs(Real estate must be in Mexican territory)	0%	5%	5%	10%	10%
	Inflation protected securities miminum[6]	Yes *(51% Min.)*	*No*	*No*	*No*	*No*
Conflict of interests	Securities endorsed by relatied parties	15%	15%	15%	15%	15%
	Securities endorsed by parties related to the Afore[7]	5%	5%	5%	5%	5%

1- All limits expressed as percentages of assets under management (Activos Netos)) but the maximum ownership of one issue. All limits are maximums, but the inflation protected securities minimum.
2- These are local rates for securities issued by Mexican nationals in Mexico. Global rates apply to foreign securities. All securities must have at least two rates.
3- Issuer or endorser in the percentage it guarantees. Counterparty exposure in repos and derivatives must be added to exposure acquired through securities.
4- Percentage of the total amount stated in the prospectus, adjusted by later amortizations and repurchases
5- Securitizations must comply with Circular 15-19's appendix K to be considered the SPV as an independent issuer.
6- Minimum limit on securities that guarantee a return equal or in excess of Mexico's inflation rate.
7- This limit is contained in the Law (Art. 48, fracc. X), although Circular 15-19 sets a limit of 0% for related parties that are financial institutions.

Differentiation factors