

Fettered Consumers and Information Mandates: Evidence from Mexico's Privatized Social Security Market

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1. Introduction

There is growing empirical evidence that consumers may not choose optimally when faced with difficult or complex choices, particularly those involving risk and uncertainty, imperfect information, or delayed payoffs over long time horizons. In these situations people may follow the path of least resistance making decisions based on shortcuts, approximations, defaults or readily available information. For example, in deciding how much to save for retirement, 401k investors often appear overly sensitive to default investment rules (Madrian and Shea (2001), Cronqvist and Thaler (2004), Choi, Laibson and Madrian (2006), Beshears et al. (2008)), desire commitment devices to increase savings (Benartzi and Thaler (2004), Ashraf, Karlan and Yin (2006)), use simple heuristics to allocate funds across investments (Benartzi and Thaler (2001), Bernartzi and Thaler (2007)) and are influenced by advertising and irrelevant information when choosing retirement investments (Cronqvist (2006), Choi, Laibson and Madrian (2007)).

When faced with complex decisions people may also be overly reliant on easily-available proxies for utility maximization such as peer opinion, brand-name or advertising even if that information causes them to make persistently suboptimal decisions (Schleifer, Mullainathan and Schwartzstein (2008), McFadden (2006)). For example, there is evidence that peers influence retirement plan enrollment decisions (Duflo and Saez (2003)) and that people choose options based primarily on easy to determine prices or brand attributes and often ignoring full costs in markets from credit cards (Ausubel (1991)) to Medicare Part D (McFadden (2006), Kling et al. (2008), Abaluck and Gruber (2009)). Individuals even fail to optimize when they have full information yet have to perform simple calculations. For example, when choosing everyday items consumers are more price sensitive to taxes that are included in posted prices than when taxes are calculated at checkout (Chetty, Looney and Kroft (2008)) and consumers substitute average for marginal prices when facing complicated pricing schedules (Liebman and Zechauser (2004), (2008)).

Several recent papers have found that decision-making improves when consumers are provided with information that lowers decision-making costs, reviving hope that with a little help, they can be sufficiently adept decision-makers to incentivize efficient markets. For

example, Hastings and Weinstein (2008) find that simplified information on public-school academic characteristics has a substantial impact on school choices and academic outcomes among low-income and minority families, Kling et al. (2008) find that simplified information can make Medicare Part D customers choose lower cost alternatives and Bollinger, Leslie and Sorensen (2009) find that calorie-posting mandates at public restaurants reduce average calorie consumption. While these results support the need for government involvement in market and information design (McFadden (2006), Thaler and Sunstein (2008)), there is sparse empirical evidence of the impact that government mandated information can have on market outcomes where consumers and regulators interact with sophisticated private firms.¹

This paper brings new evidence on consumer behavior from Mexico's privatized social security system, and examines the role information mandates can play in shaping consumer demand and market outcomes in the presence of sophisticated firms. Mexico privatized its social security system in 1997, moving from a pay-as-you-go system to a defined contribution system with individual private accounts. Accounts are managed by for-profit fund managers, but the market is heavily influenced by government regulation of contributions, firm entry, investment vehicles and risk, advertising, and to some extent management fees. Investors are required to contribute a fixed amount of salary to the account, but are allowed to choose between the approved fund managers. Since the system's inception, between 10 and 21 firms have competed for over 25 million customer accounts. We use detailed individual-level administrative data on contributions, employment and fund manager choice to examine key aspects of investor behavior and market responses to mandated information in one of the largest privatized social security markets in the world.

We begin by examining whether or not account holders manage their accounts efficiently. While several of the papers reviewed previously show the shortcomings of savings-for-retirement decisions in isolated contexts, we can examine across broad demographic groups how various factors (e.g. employment status, salience, peers, switching costs or advertising) influence when accountholders switch fund managers and how they select their fund manager. Overall, we find that workers pay little attention to management fees when selecting accounts. Workers switch account managers very infrequently, and even at the time of selecting a fund

¹ Andrabi, Das, Khwaja and Pomona (2009) find evidence that private schools in Pakistan respond to school ranking systems by adjusting tuition prices.

manager they could save an additional 2.5 days wages over the next year by switching to a lower fee firm than the one they chose. Despite the fact that firms charge both fees on contributions to the account and fees on assets under management, we find that workers entering long spells of unemployment fail to move their assets toward managers that are cheapest for them given their employment status.² Importantly, the largest determinant of account switching is forced interaction with the account through early withdrawal for unemployment insurance benefits. Once workers exit the formal sector, they are very unlikely to ever switch account managers despite large changes in relative management fees. We also find that low-income workers are heavily influenced by their place of work, being more likely to switch toward a more popular fund manager after moving to an employer where their current fund manager has a minority share, and appear to be influenced by exposure to sales agents and advertising by fund managers when deciding whether to switch accounts and which manager to select.

Because fees charged by managers are complicated, involving multiple fees stated as percentages on wages or on balances, workers could have difficulty calculating the lowest cost manager. They also may have had difficulty evaluating the relative importance of fees reported as annual percentage rates compounded over long periods of time (Hastings and Tajeda-Ashton (2008)). Thus, switching costs, peer opinion and advertising may dominate workers fund management decisions. In part to address this issue, the government changed key information mandates halfway through our sample, increasing the prominence of a single fee ranking they created to help workers compare fund manager fees. This summary fee statistic integrated fees on contributions and balances according to particular assumptions, distilling the multiple fees into a single ranking, but making the information irrelevant for a significant portion of the population (e.g. it did not reflect the true ranking of actual costs for many account holders). We examine the impact this information mandate policy had on fund manager choice. Using a random utility model, we show that the mandate doubled the estimated weight workers placed on this easily-available and digestible information, even if it caused them to choose higher cost funds given their personal wage, balance and labor market characteristics. Thus mandated information can be a very successful tool for shifting demand in complicated markets, just as

² There is a large informal labor market in Mexico, and throughout the paper we will refer to "employment" versus "unemployment" in the formal sector. However, people who are "unemployed" in the formal sector may very likely be gainfully employed in the "informal" sector.

peer opinion and advertising can shift choices simply because they are easy substitutes for complex calculations.

This paper proceeds in five sections. The next section provides a background on the Mexican Social Security System and key policy changes during our sample time period. It is followed by a description of our data, then an empirical analysis of worker choices, an analysis of firm incentives, and finally concluding thoughts.

2. Background on Mexican Social Security System

2.1 Overview

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.³ In June 2007, SAR had over 25 million registered accounts, and total funds in the system exceeded 1.14 trillion pesos.

2.2 Afore approval, operation and investment restrictions

During our sample period, September 2004 - December 2006, there were between 13 and 21 Afores in the market, with 10 firms present since the inception of the system and three firms entering in the last 6 months of the sample. CONSAR must approve each Afore that offers management of pension fund, and Afores must submit fee schedules for approval and must seek CONSAR's approval for any subsequent fee changes they wish to implement. Appendix Table 1

³ 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 the base salary as well as a "social contribution" of 5.5% of the inflation-indexed Mexico City minimum wage (Sinha (2003)).

lists the Afores with their entry date as well as a description of the firm. The Afores range from prominent Mexican banks like Banamex, and international investment firms like HSBC, to department store chains like Coppel (similar to Sears).

Afores had to offer two age-based investment funds, called Siefores (Specialized Investment Groups for Retirement Funds): A “higher-risk” fund for workers 55 and under called Siefore Básica 2 and a “low-risk” fund for workers over 55 called Siefore Básica 1.⁴ *Management fees are set at the Afore level, so the same management fee applies to both Siefores within each Afore.* In addition, affiliates cannot split their funds between Afores or Siefores, but must keep their funds in only one fund at one fund administrator at a time.⁵ The investment possibilities for each Siefore are heavily regulated by CONSAR. Siefore 1 was effectively restricted to investing in Mexican government bonds, and while Siefore 2 could include investments in equities, equity investments were capped at 15% and the investment vehicles restricted to Principal Protected Notes and Exchange Traded Funds tied to major stock indices. Hence Siefores were effectively fund managers that could invest in government bonds, high-rated corporate bonds, and broad equity indices.⁶

2.3 Management Fees

Afores were allowed to charge two different types of fees: a load fee and a fee on funds under management, and despite the tight investment regulation, Afores charged high and disperse management fees. The load fee was referred to as a “flow fee” because it was quoted as a percent of the worker’s salary instead of as a percent of the contribution to the account, and only contributions, *not account transfers*, were subject to the load.⁷ However, this convention implied that flow fees were reported in a way that made them seem smaller than they were - *a flow fee of 1% of salary is actually a 15.4% load fee on the contribution of 6.5% of salary (1/6.5 = 0.154)*. In June 2006, flow fees ranged from 0.5% - 1.65% (i.e., a 7.7% - 25.4% load). In addition to the flow fee, firms charged balance fees ranging from 0.12% to 1.5%.

⁴ 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.

⁵ 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.

⁶ Hastings and Tejeda-Ashton (2008) provide more detailed information on investment requirements and holdings for the Siefores during this time period.

⁷ In other words, there are no monetary costs of transferring an account from one Afore to another.

Importantly, the mixture of fees implied that the optimal firm for a worker could depend on their wage to balance ratio. For example, a woman currently employed in the formal labor force who planned to exit the labor force after marriage for a few years, could disregard the flow fee and choose the Afore with the lowest balance fee since she would expect to have zero contribution flow into her pension account while out of the labor force. The same would apply for someone exiting the formal sector to take a job in the informal sector for a sizable period of time. This variation in the optimal fee as a function of formal labor employment will help us test for example how forward-looking workers are when choosing funds.

In addition, most firms offered a tenure discount off of the flow fee. This was typically a small basis point discount per year with that Afore. This of course introduces a switching cost, and realizing this, CONSAR ruled in January 2005 that all tenure discounts had to be recalculated based on years in the system instead of years with an Afore. Thus a person who had 5 years vested with a particular Afore would now be offered a 5 year discount with any Afore they chose. These sorts of changes in regulations will aid identification of how much attention workers pay to actual costs versus more salient or easy-to-understand Afore characteristics.

2.4 Information on Fund Choices and Fees

Of course, multiple fees, discounts, and changes in discount rules make it more difficult to calculate the personal alternative costs of each Afore. To simplify fee information for affiliates, CONSAR created a composite fee index called the “Equivalent Fee on the Balance.” We will refer to this fee as the CEF (CONSAR’s Equivalent Fee). This fee was the total cost for a person with wage W , balance B , and tenure T expressed as a fraction of their balance. Prior to July 2005, CONSAR published this fee over a 25 year period. In addition, the assumed wage was very low given the assumed balance relative to actual affiliate accounts in the system. For these two reasons, the 25 year CEF was close in magnitude to the balance fee for each Afore, and the spread between them was compressed in absolute terms. In July 2005, CONSAR mandated that going forward, the CEF would be computed over a 1 year period instead of over a 25 year period. This tripled the size of the CEF, making it closer in size to a flow fee (as a percent of wage) than the balance fee, and increased the absolute fee different between different Afores. In addition to changing the CEF from the 25 year to the 1 year calculation, CONSAR also introduced new regulations requiring the prominent display of a comparative CEF table on the

front page of each worker's account statement. They also required that each affiliate signed a form stating that they saw and understood the 1 year comparative CEF table when submitting an application to switch Afores.

Table 1 shows how changing the assumed time horizon in the CEF calculation changed the relative 'official' fee tables for the Afores. The first column shows the 25 year CEF for each Afore in July 2005 when the calculation change went into effect. The Afores are sorted from lowest to highest 25 year CEF. The second column shows their corresponding 1 year CEF, the fee that replaced the 25 year CEF in July 2005. The third column gives the relative rank of each Afore based on the 1 year CEF. Two things happened with the CEF: first the scale became 2-3 times as large since the 1 year fee is closer in value to the flow fee than to the balance fee for any positive wage and balance calculation. Second, the CEFs became more dispersed and the relative cost of each Afore changed dramatically with relatively high-flow-low-balance-fee Afores becoming relatively expensive.

Figure 1 shows the CEF for each Afore from June 2004 through June 2007. There are thick black vertical lines to demark our sample period and a thick red vertical dashed line that marks the point when CEF calculations changed in July 2005. Two features stand out. First, there is a large change in CEFs a few months before the information mandate changed. This was caused by changes in the monthly wage assumption. In fact, there are several instances over our sample where CEFs changed solely due to changes in the federal minimum wage, the assumed wage or balance – all factors that are used to calculate the CEF. Secondly, there are large declines in the CEFs in the later portion of our sample. These were generated by sharp declines in flow fees coupled with increases in balance fees at many Afores. Later, we will show that these fee changes were driven by the increased attention consumers paid to CEFs once the new regulations came into place and the mechanical change in how flow versus balance fees impact the CEF in the 1 year versus the 25 year calculations.

3. Data Description

We begin by examining whether or not account holders manage their accounts efficiently. While several of the papers reviewed earlier examine shortcomings of savings-for-retirement decisions in isolated contexts, for example examining the impact of a particular factor

on savings behavior workers at a particular firm, our data allow us to compare behavior across broad demographic groups and examine how factors such as employment status, salience, peers, switching costs and advertising influence when account holders switch fund managers and how they select which fund manager to go with. We combine several administrative data sets on firm characteristics and worker accounts in Mexico's privatized social security system from September 2004 through December 2006 to form a detailed picture of employment, contributions and fund administrator choice. First, we use administrative data that records each contribution made into each account on a bimonthly period. These data include each affiliate's wage, the Afore that manages their account, a unique employer id, and the number of days worked during the bimester. We combine this with data on account balances (recorded semi-annually) and the zip code of residence for each account holder in June 2006 to construct variables on formal-sector labor-force participation and formal-sector co-worker characteristics on a monthly basis. We combine this with records for each Afore switching application along with the approval date, account balance and liquidation date. This allows us to construct a complete time series for each worker's Afore at every point in time, regardless of whether or not they are actively contributing to the account through private-sector employment.

Further, we combine this data with various measures of Afore monthly fees and monthly records for the number and location of sales agents for each Afore to create two data sets. The first data set is a monthly data set of employment status and Afore enrollment for a 5% random sample of affiliates in the system. We use this to examine the impact that peers and switching costs have relative to changes in management fees on when workers decide to switch accounts. The second data set uses the information on which Afore's workers select at the time of selection, and constructs worker characteristics and characteristics of each Afore the worker could choose between to estimate the relative importance workers place on factors such as actual costs, CEF, brand name, peers when selecting an account. The Data Appendix provides a detailed description of the database and variable construction.

4. Empirical Analysis of How Investors Manage their SAR Accounts

4.1 Summary Statistics

With these two data sets in hand, we begin by examining basic summary statistics that give us a clear idea of what affiliates look like, which factors drive account management decisions, and the extent to which investors appear to fall short of forward-looking, frictionless decision-making.

Figure 2 calculates market share for each Afore in June 2006 based on fraction of pesos under management, and then plots each Afore's balance and base flow-fee position. Each point represents an Afore in June 2006, and the size of each point reflects its market share. The market shares and names of each Afore appear next to their observation on the graph. Two things are immediately apparent. First, there is no one Afore that dominates other choices on both the flow and balance fee. Second, Afores that have clearly higher flow and balance fees than others have the largest market shares.

Figure 3 illustrates how well affiliates in June 2006 did in selecting the Afore that was the relatively lowest cost for them given their relative wage to balance ratio. To do this, we calculate the 1 year CEF for each worker using their actual wage and balance information. We then calculate the average fee paid by each worker in the system if they held their account with Afore j , and the average fee paid by workers who actually have their account with Afore j . Figure 3 plots these two averages for each Afore along with the 45 degree line. Each point represents an Afore and is again sized to reflect its relative market share. If workers were selecting into Afores whose fees were low for them given their expected contribution rates and balance in their account, we would expect to see most of the points below the 45 degree line. It looks like some of the points fall below the 45 degree line, but not by much, and a considerable share of the market falls above the 45 degree line. In addition, one can see how the assumptions in the CEF understate fee levels. From Figure 1 we saw that the 1 year CEF in June 2006 ranged between 1.52% and 3.48%. The average 1 actual year cost expressed as a percent of actual balances is roughly twice as large, ranging from 2.71% to 6.93%.

Table 2 presents summary statistics from a monthly panel of a random 0.5% subsample of affiliates in the system from September 2004 through December 2006. Note, all financial statistics are reported in Month/Year Mexican pesos unless otherwise noted; the symbol for a Mexican peso is \$, and from 2004-2006 one US dollar was worth between 10.40 and 11.63 Mexican pesos. Approximately 62% of system affiliates are men, reflecting the higher propensity of Mexican men to participate in the formal labor market. The wage distribution is skewed to the

right – with an average employed wage of \$4,812 pesos that is substantially larger than the median of \$2,995 pesos due to very high wage earners in the top 1% of the distribution. The balance is also skewed right, and overall, pension account balances are relatively small with a mean of \$25,084 and a median of \$11,211 (in comparison to US 401(k) accounts, for example).

The second panel in Table 2 provides summary statistics on employment. Out of our sample of workers who have ever worked in the formal sector (and thus generated an Afore account), the formal sector employment rate is only 40% over the 2 year period. This reflects the high degree of mobility between formal and informal employment in Mexico. In fact, only about 20% of workers are 100% employed in the formal sector and slightly more than 25% of account holders had no formal-sector employer during our 36 month period; a relative boom period in the Mexican Economy. During our sample, the median worker had one unique formal sector employer, and worked at a firm with 133 employees.

Given the relative mobility between the formal and informal labor markets, and the number of substantial fee changes over the time period, we might expect that most workers would have changed their account manager at least once to re-optimize the cost of management given changes in labor status or changes in relative prices. Table 3 presents summary statistics on the tenure and Afore characteristics by employment status. First, despite the high turnover in the formal sector, few affiliates switched Afores during our sample period (only 18% of affiliates had more than 1 afore during the 30 month period). In addition, the average length of time in the current Afore is close to the average length of time in the system. In addition, if we break workers into three groups, those who are currently employed in the formal sector, those who are currently unemployed and those who were always unemployed during our panel (the last two are not mutually exclusive), we see that all workers could move to Afores with substantially lower fees as measured by either the flow fee, the balance fee or the CEF. Moreover, there does not appear to be any difference in potential fee gain across workers who are persistently employed outside of the formal sector and those who are currently contributing to their Afore accounts. This suggests that workers are not forward looking or do not understand the different types of fees and hence do not reallocate their accounts across fund managers when exiting the formal sector to minimize balance fees. In fact, workers do not appear to be minimizing fees at all, since even the 10th percentile of workers could realize a substantial reduction in the various measures of fees at any point in time by moving to another Afore.

One reason for this may be that, because workers update their accounts very infrequently relative to how often the relative costs of the Afores change, they may have chosen a low fee firm at the time of deciding, but it now looks like a relatively high fee firm. Table 3 shows that this is not the case. At the time of switching, the average worker is moving to a firm with slightly lower flow fees, a lower CEF, but on average a marginally higher balance fee. However, on average, choosing the lowest fee Afore instead of the one actually chosen would have resulted in substantial gains on flow fees, balance fees or CEF's. The final row of Table 3 shows how many pesos were left on the table at the time of choice. If we calculate the actual difference in peso cost per year at the cheapest fund versus the fund chosen and convert it into days wages (divide by person i 's average daily employed wage over our sample period), we see that the average worker could save 2.5 days wages over the course of one year by switching to the lowest cost Afore (for them) instead of to the one they chose.⁸

To preview how the change in information mandate changed how people made decisions, we divide the sample into pre- and post-information mandate periods and summarize the change in rank from the old Afore to the new Afore at the time of choice. Since the CEF changed in magnitude with the new information mandate, we summarize how the rank of the Afore changed to compare behavior across the two time periods. Table 5 suggests that behavior changed dramatically. In particular, before the information mandate change, the average change in CEF rank between the old and new Afore was -0.04, implying that on average affiliates were switching to Afores with the same CEF as the one they were in. After the information mandate change, however, the average switcher was moving to an Afore that was 2.41 ranks lower (cheaper) than their current Afore on CEF. Since the CEF is correlated with balance and flow fees, and since it was now much more sensitive to flow fees, this also implied that switchers were on average moving towards cheaper Afores on balance and flow fees as a result of the increased focus on the CEF.

4.2 Determinants of when workers change Afores

Tables 2-5 show that at first glance, affiliates are unlikely to manage their accounts in a forward looking manner and do not appear to place a heavy emphasis on management fees when

⁸ This is true for all expected wage and employment calculations we considered. It holds for perfect foresight and also if we assume people forecast their recent average employment and wage going forward.

they do update their accounts. To examine the role that switching costs, peers, and easy information play in management decisions among high and low income workers, we use our panel of contributions, employment and Afore choice to estimate the factors that influence when a person switches accounts. We use changes in place of employment to estimate peer and employer effects on account management decisions, and we examine the role salience and switching costs play by estimating the impact that qualifying to withdraw unemployment insurance from the Afore account has on the probability of switching account managers. In particular, we estimate the following discrete-time hazard model of the probability that worker i switches to a new Afore in a given month t :

$$y_{it} = \beta'X_{it} + \lambda'Z_{it} + \delta T_{it} + \delta'D_{it} + \varepsilon_{it} \quad (1)$$

where X_{it} , includes demographic characteristics such as average employed salary, gender and age, employment indicators and indicators for periods in which a person switches jobs. Covariates, Z_{it} , capture independent variables that vary at the Afore, time, and affiliate level. These include the market share of person i 's current Afore at their current place of employment, the relative expense of management fee for person i 's Afore (flow fee, balance fee and CEF), and a measure of person i 's county-level exposure to total sales agents. We include dummies for each length of time in each month in the current Afore, T_{it} , and *because our data tell us the date at which the person registered with their current Afore, we can construct the time that each person was in their Afore at the start of our panel*. All specifications include monthly dummies and Afore fixed effects.

Table 6 presents results from (1) run separately for 5 employed wage categories: by quartile with the last quartile split further into the 75th-90th percentile and the 90th and above to allow for greater differences in behavior in the upper-tail of the income distribution. All regressions include Afore fixed-effects, monthly dummies, and dummies for length of time in current Afore. The mean dependent variable, the probability of switching Afores in a given month, is very low but increasing in income. For the lowest wage category, the probability of switching is 0.002, but is more than 100 times larger, 0.0215, for the highest decile of the income distribution. Within each wage category, the probability of switching is also increasing with wage, but at a decreasing rate as we move to higher wage categories. In general, age is not a

significant determinant of frequency of account management, but men switch Afores significantly more often than women, particularly among the highest wage earners.

The second panel of results shows how employment status affects the probability of switching Afores. The first variable is an indicator of the first 2 months after exiting the formal sector. Workers are allowed to draw up to 3 months of their last wage as unemployment insurance from their Afore once they have been unemployed for 45 days, and as long as they had contributed for 3 years and had not taken unemployment insurance in the past year. This 2 month indicator variable would include anyone who had exited the formal sector in the last 74 days. Lower income workers are much less likely to meet the requirements for withdrawing the unemployment insurance than high income workers, thus income level and exit from the formal sector proxy for eligibility to file paperwork to withdraw unemployment insurance funds from the savings and retirement account. Interestingly, for workers above the 50th percentile of the wage distribution, the effect of exiting the labor force is strong and positive, increasing the probability of switching by 20.7, 89.9 and 210% for the highest three wage categories respectively. In contrast, among the lower 50% of the wage distribution, entering a spell of unemployment decreases the probability of switching by 23-36%. This is closer in sign to impact of being unemployed after the first two months. Once workers exit the formal sector they are very unlikely to actively manage their accounts; the probability of switching Afores falls by 84.3-88.5% across all wage categories. The strong impact of employment changes suggest that salience and switching costs are large determinants of when workers switch Afores; times that increase paperwork and force transactions with the Afore increase the probability of switching substantially, but once a worker exits the formal sector and either is out of work or works where benefits are not offered, they are very unlikely to re-evaluate their account and change their Afore.

We can also use changes in employment to examine when workers switch Afores is caused by the relative popularity of their current Afore at their place of employment. For example, if a worker moves to a new job where their current Afore is in the minority, are they more or less likely to switch their Afore? To measure this we construct the share of person *i*'s Afore at the moment they enter the place of work, *Popularity of Initial Afore*. It measures the market share of person *i*'s Afore at *i*'s new place of employment. At the start of each employment spell with a new employer, this is recalculated. For the lowest two income groups, it

is a significant determinant of when workers switch Afores. A higher Popularity of Initial Afore significantly decreases the probability of switching Afores; and increase of 10% decreases the probability of switching by 4.66 and 5.21 percent for the first and second wage categories respectively. There is no significant impact on higher-income workers, suggesting that lower-income workers are more influenced by peers when deciding when and how to manage their accounts. Similarly, we see that increased exposure to Afore sales force has a significant and positive impact on the probability of switching Afores among lower income workers, and no impact in the top quartile of the wage distribution. The mean concentration of Afore sales agents in a municipio is 1.51 (per thousand IMSS affiliates) with a standard deviation of 0.50. Hence a 1 standard deviation increase in the sales force concentration in a low-income person's Municipio increase their probability of switching by about 7%. Here we can compare effect of word-of-mouth to sales force. A one standard deviation increase in the share of an Afore in the workplace is 0.1, and has around a 5% impact on the probability of a person in the lower income quartile switching; very similar in magnitude to the effect of sales force.⁹

It is important to compare how these factors compare to the impact that changes in fees had on the probability of switching Afores. To capture changes in relative fees, we create the rank for the current Afore according to several different measures of fees each month. The first is the personal flow fee, including tenure discounts which change exogenously with regulatory changes at the start of 2005. The second measure is the balance fee. For both of these fees, higher-income workers are the only workers who appear to increase their probability of switching when their Afore becomes relatively more expensive. Even for the highest-income group, the impact is very small in magnitude, with the effect of a one rank increase increasing the probability of switching by only 1.5%. However, if we look at ranking based on the CEF and its interaction with the period post-information change, we see that in the post period, an increase

⁹ We ran specification checks where we use the control function approach proposed by Rivers and Vuong (1988) to control for the potential endogeneity of local sales force concentration. We found very similar results, and the first stage residuals were not significant in 3 out of the 5 wage-category regressions. Our first stage regression regresses Agente Concentration on municipio-month level factors that arguably shift the cost of hiring Agentes. These factors were created from the INEGI 2000 census data and include: the fraction of people and women ages 18-30 who are students (capturing presence of local colleges or degree programs which is a primary group of people targeted by Afores to become Agente Promotores), the fraction of households with television (a substitute for advertising with Agentes), percentage of workers 18+ who are employed by the government (competing demand for labor pool, and government workers have a separate savings and retirement system outside of Afore market), median wage of workers 18 and over, the variance of government employment across localities within a municipio, and the monthly inflation rate and its interaction with local fraction of people and women who are students and the local median wage rate.

in the current Afore's CEF rank had a very large impact on the probability of switching. The impact is strongest for low-income workers, implying that an increase in own-Afore rank in CEF post information mandate increased the probability of switching by 23.3%.

In summary, workers appear to face high switching costs. When they interact with their accounts for immediate benefit is the time they are most likely to switch fund managers. Once they exit formal employment they become very unlikely to update their accounts, leading to a large inert mass of participants in the system. While changes in fees do not appear to increase probability of switching accounts, there is some evidence that information mandates were effective at increasing account switching activity.

4.3 Determinants of which Afore workers select

To further examine the effectiveness of the mandates, we estimate the impact it had on the implicit weights affiliates placed on different fee measures relative to other factors such as brand name, popularity at the work place, and past returns. In particular we allow workers to choose Afores based both on actual one year projected costs and the published CEF. We allow the preferences for these two competing cost measures to change when the information mandates come into effect and when the CEF changed formats in July of 2005. Specifically we construct the choice set that each affiliate faced at the time of selecting an Afore and estimate a random utility model of the form

$$U_{icjt} = \beta_c X_{icjt} + \varepsilon_{icjt} \quad (2)$$

where i denotes the account holder, j denotes the Afore, and t denotes time period and c denotes the personal characteristics cell into which person i falls. We break up affiliates into 240 categories of wage, age, gender, employment and geographic region of residence, and estimate a conditional logit model of Afore choice within each of these cells. Additionally, within each category we interact Afore characteristics with wage levels. This effectively allows for a very flexible functional form for Afore demand. X_{icjt} includes the personal cost over a year for worker i at Afore j at time t , its interaction with average employed wage for worker i , the CEF for Afore j at time t and its interaction with average employed wage for worker i , the share of accounts at Afore j and worker i 's place of employment at time t , fixed-effects (brand dummies) for Afore j ,

and interactions between Afore fixed effects and the concentration of its own sales force in i 's municipality of residence.¹⁰

Once we estimate the coefficients for each person i in each cell c , we can convert the coefficients into interpretable estimates by converting them into demand elasticities or normalizing them by the weight placed on cost to get a dollar value attached to each characteristic. Table 7 presents regressions describing how estimated demand elasticities with respect to CEF and Costs covariates of interest. Each observation is a demand elasticity for a person-Afore combination at the time of choice. Each regression includes Afore fixed effects. The mean elasticity with respect to both cost measures is low – well less than unit elastic. However, the average affiliate is much more elastic in the post-Information change period with respect to the CEF. At the same time, price sensitivity with respect to the actual management costs became less negative after the information mandate change. Overall, men are much more sensitive to the CEF, and less sensitive to actual costs. Higher-income workers are on average more price sensitive as measured by either the CEF or costs. Unemployed workers, while much less likely to manage their accounts, are much more sensitive to the CEF when switching. However, in part because they should be minimizing balance fees instead of CEF's, they appear to actually prefer funds with higher personal costs. After the information change, the average sensitivity to the CEF dropped by 0.821, confirming that the information mandate had a substantial impact on demand responsiveness to the CEF. At the same time, sensitivity to cost increased, as workers turned their focus to the more salient CEF and away from seeking information on actual costs. Both pre and post information mandates, exposure to sales agents is associated with increased elasticity with respect to the CEF and decreased sensitivity to actual costs, suggesting that on average, Afore sales force worked to enhance focus on the CEF instead of 'debiasing' or educating consumers on actual costs.

¹⁰ Our demand estimation assume that affiliates choose an Afore to maximize utility as a function of Afore characteristics and personal preferences. This traditional interpretation implicitly assumes full information, and we interpret the utility parameters as importance placed on different characteristics when selecting an Afore instead of strict preferences under the assumption that all affiliates can easily determine the relative costs and benefits of enrolling with each Afore (Borghans, Duckworth, Heckman and Weel (2009), Hastings Kane and Staiger (2009), DellaVigna (2009)). In addition, we 'control' for the potential endogeneity of sales force concentration using Petrin and Train (2008) extension of Rivers and Vuong (1988) control function approach to conditional logit analysis.

5. Conclusion

There is growing evidence that consumers may not act sufficiently in their own self interests to generate competitive pressure and efficient private markets for goods that involve information costs or complex, forward-looking cost and benefit evaluations. We examine detailed data from Mexico's privatized social security market and find that investors place little weight on management fees, and that their account management behavior is instead dictated by convenience, switching costs, peer and employer effects, and advertising. The sensitivity to peers, brand name and advertising is particularly strong among low income workers.

We also find, however, that information mandates can substantially impact demand, particularly among low income workers. Using changes in the information requirements that were introduced half way through our sample, we show that workers gravitate towards easy-to-obtain-and-understand information on management fees at Afores. Thus information mandates are a successful tool for 'nudging' consumers towards price sensitivity. However, we also show that sophisticated firms do not face the same decision-cost hurdles that consumers do. If mandated information does not nudge consumers in the right direction, sophisticated firms can and will use it to raise prices, resulting in lowered consumer wealth at retirement.

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Figure 1a. Afore CEF, June 2004 - June 2007

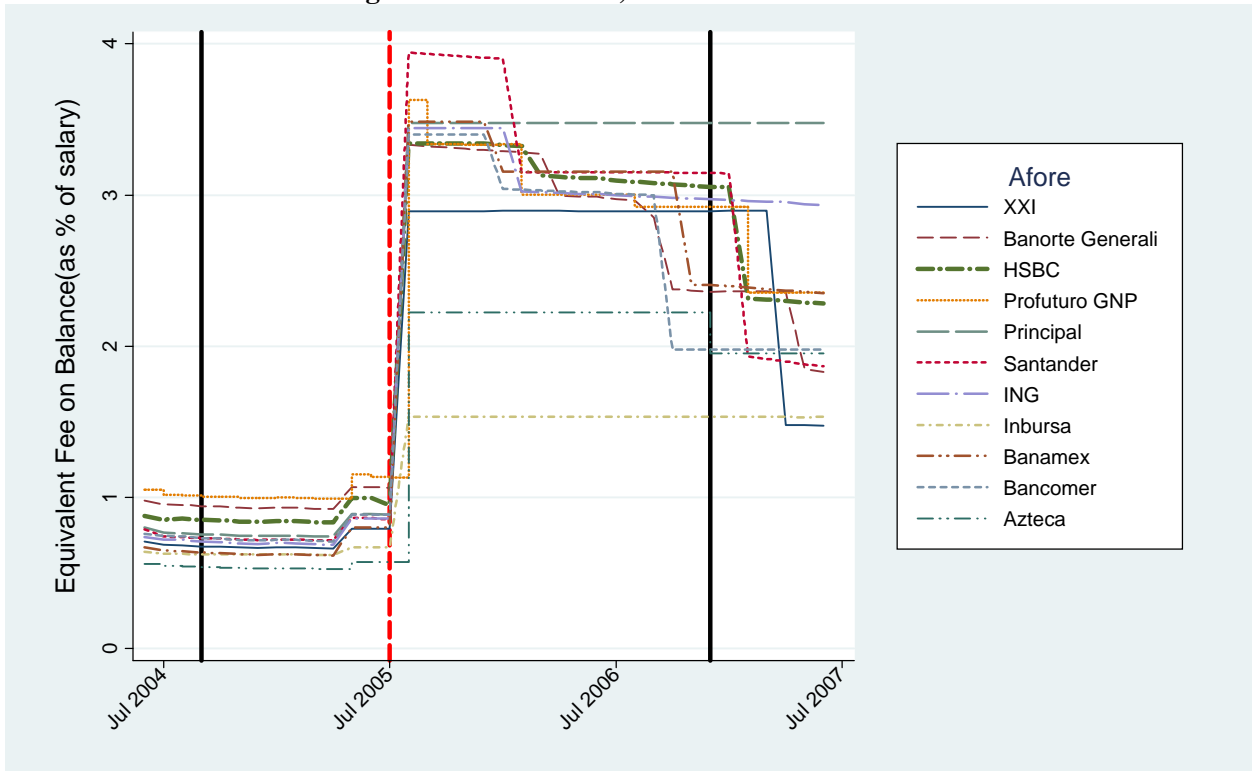


Figure 1b. Afore CEF, June 2004 - June 2007

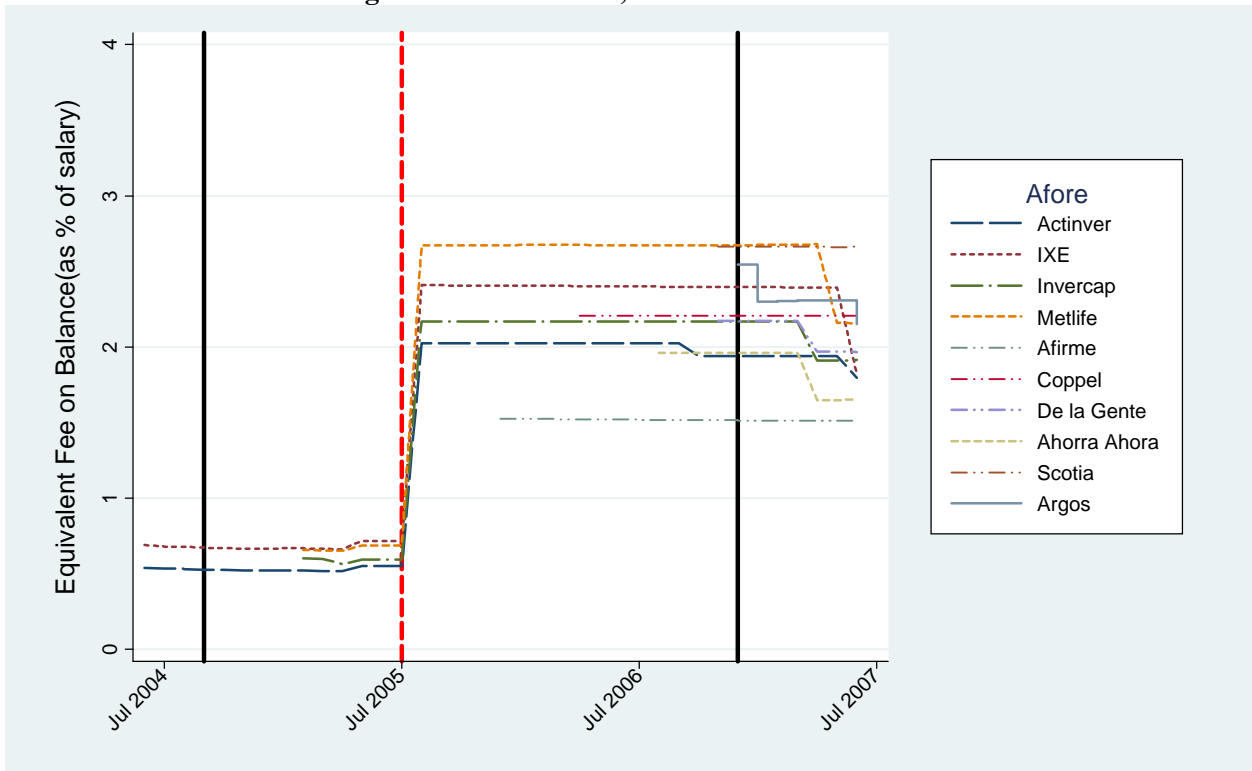


Figure 2. Afore Balance vs. Flow Fee, Weighted by Pesos Market Share

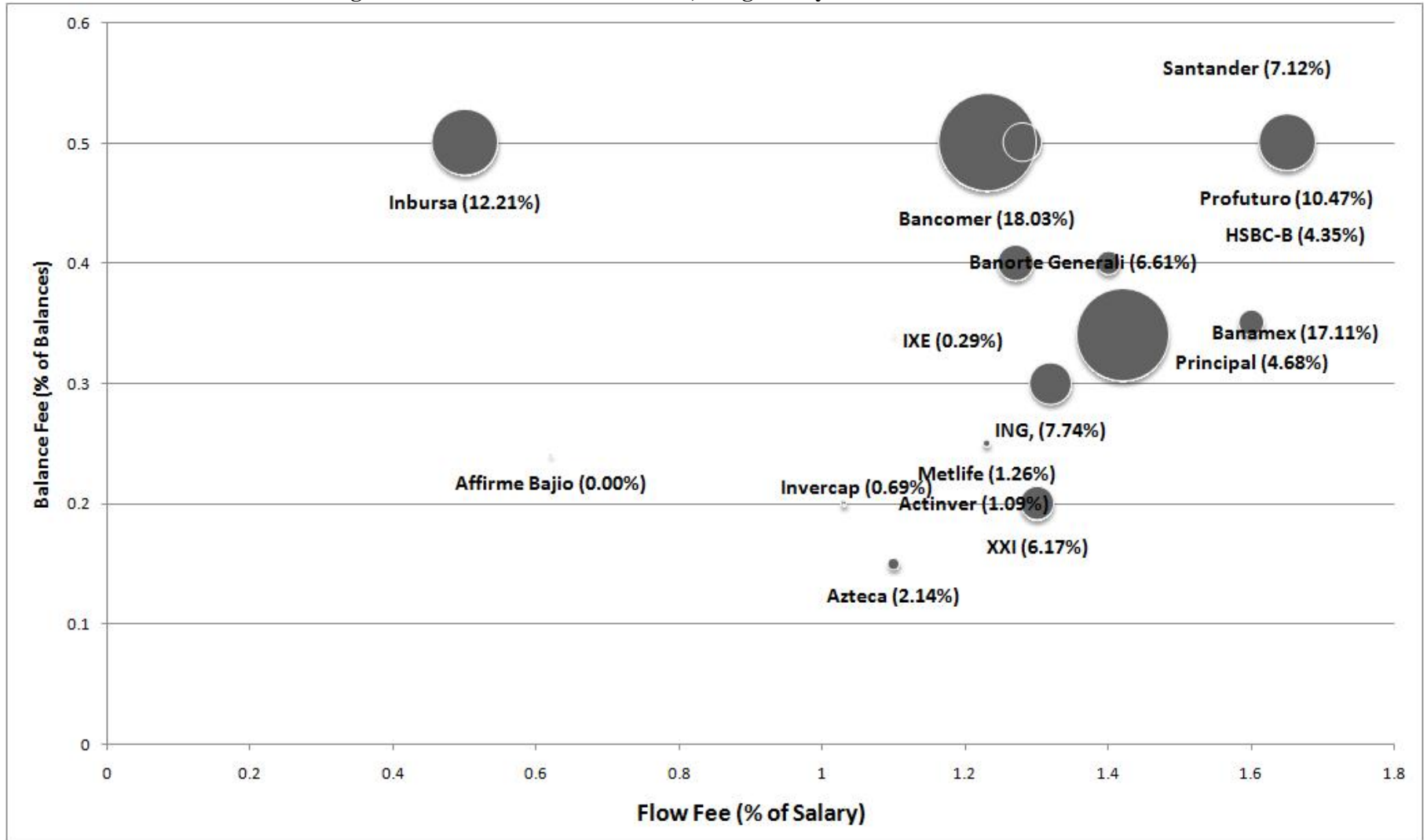


Figure 3. Average CEF Fees: Actual vs. All Accounts

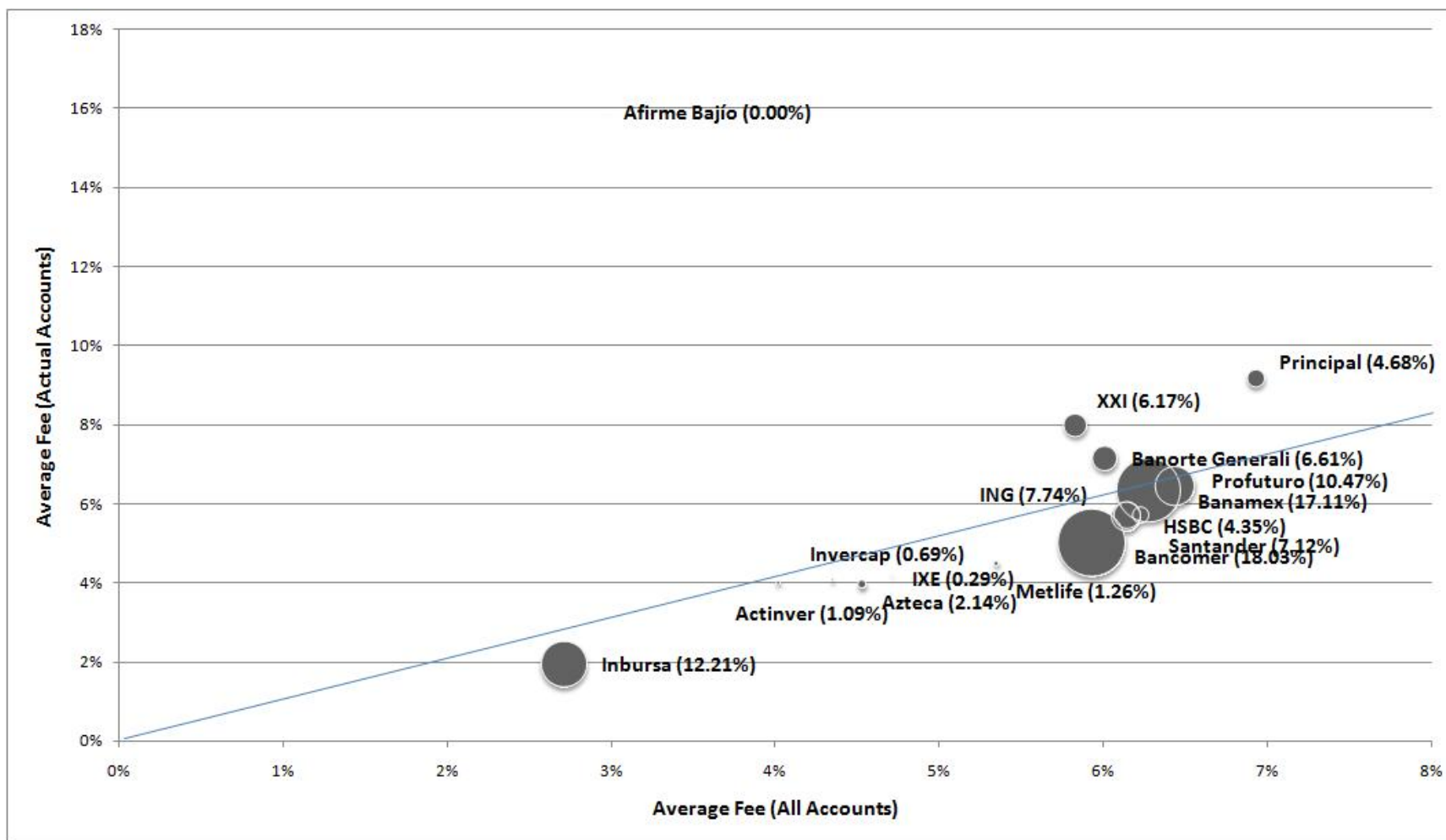


Figure 4: Flow Fee Changes

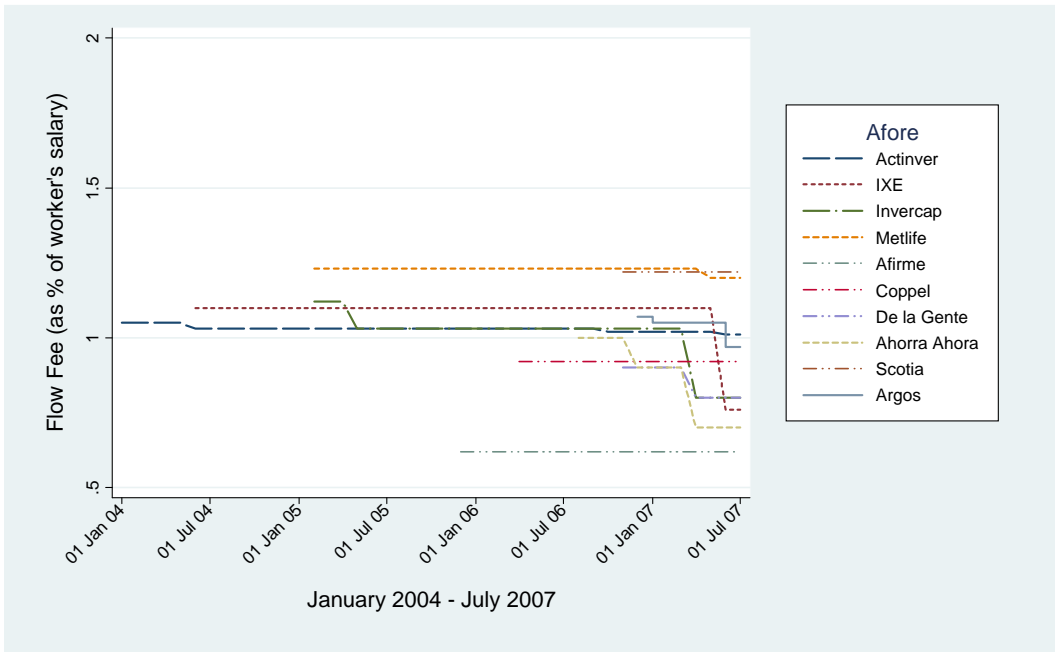
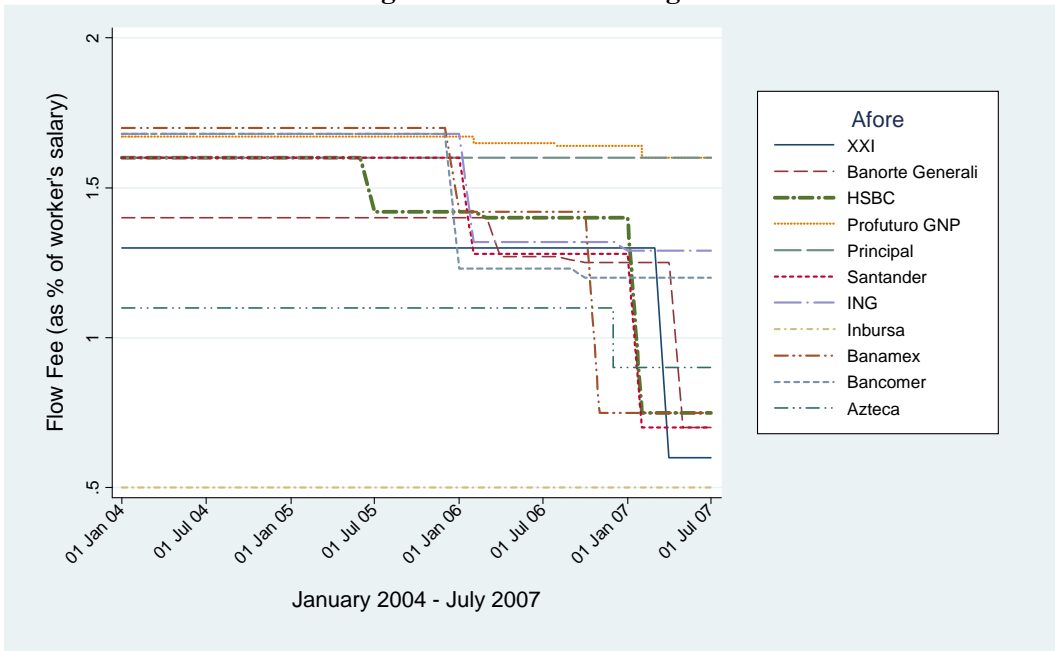
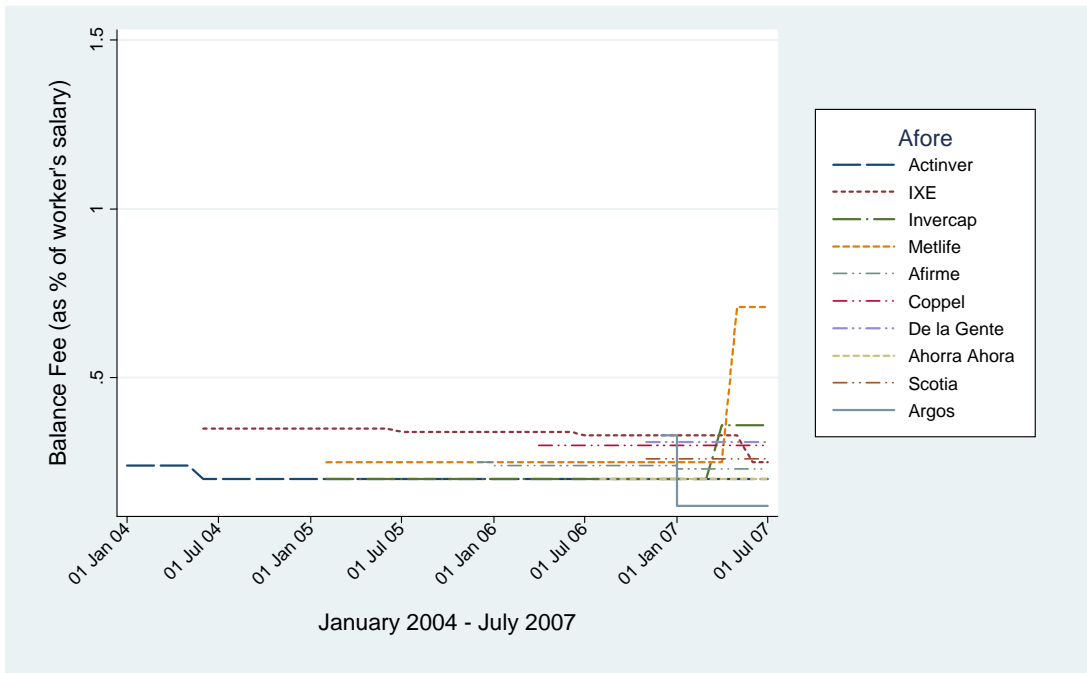
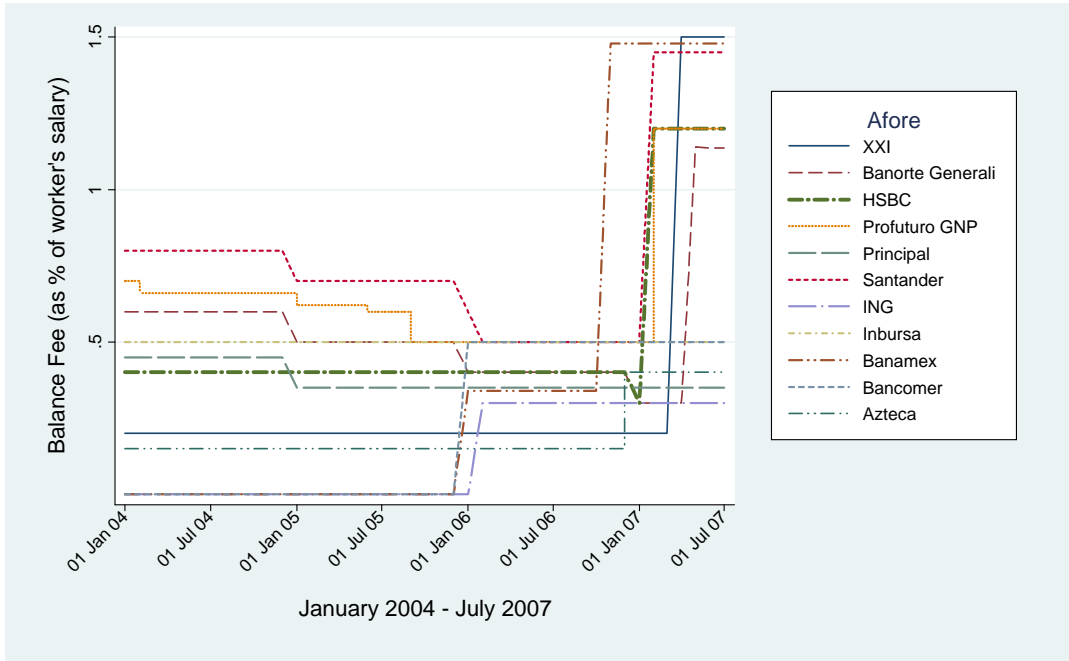


Figure 5: Balance Fee Changes



**Table 1: Equivalent Fee on Balance (CEF): 25 Year vs. 1 Year Calculation
for July 2005**

Afore	25 Year CEF	1 Year CEF	1 Year CEF Rank
Actinver	0.55%	2.02%	2
Azteca	0.57%	2.22%	4
Invercap	0.60%	2.17%	3
Inbursa	0.67%	1.53%	1
Metlife	0.69%	2.67%	6
IXE	0.72%	2.41%	5
XXI	0.79%	2.89%	7
Banamex	0.80%	3.49%	13
Santander	0.85%	3.95%	15
ING	0.86%	3.44%	11
Bancomer	0.88%	3.40%	10
Principal	0.89%	3.48%	12
HSBC	0.95%	3.34%	8
Banorte Generali	1.07%	3.34%	9
Profuturo	1.13%	3.63%	14

Table 2: Summary Statistics on Affiliates and the Employment (0.5% random sample)

	Mean	10th Pct.	25th Pct.	50th Pct.	75th Pct.	90th Pct.	N
<i>Demographics</i>							
Male	0.62	--	--	--	--	--	98,570
Age (years)	35.07	22.08	25.91	32.43	41.95	52.15	98,570
Monthly Employed Wage (Pesos)	\$4,812	\$1,428	\$1,885	\$2,995	\$5,128	\$9,999	98,570
Account Balance (Pesos)	\$25,084	\$352	\$2,849	\$11,211	\$29,242	\$61,906	98,570
<i>Employment</i>							
Unemployment Rate	0.6	0	0.07	0.82	1	1	98,570
N Employers	0.89	0	0	1	1	2	98,570
N Employees	1,326	5	22	133	671	2,852.00	38,908

Notes: Data taken from administrative data on social security account contributions from September 2004 through December 2006. Age is calculated from the birthdates attached to the account. Average wage is the average wage for the work across all periods they were employed during the sample period in December 2006 pesos. If the worker was unemployed during the entire period, the wage is last recorded wage inflated to December 2006 pesos. Account balance is the balance in each account in June 2006. Fraction of months not formally employed is the percent of months in our sample that the worker does not make a contribution to the social security account. Number of formal employers is a count of the number of unique employer id's that are recorded for each worker during the sample period, and the number of employees at each firm is calculated as the total number of employees for each unique employer id number that have wages and contributions in each period for the entire population of contributions in each month. The number of years in the current Afore is calculated for each participant as of June, 2006 based on the date they first registered with their current Afore. The number of years in the system is calculated for each person as of June 2006 and is based on the date they first contributed to the new privatized system. The number of Afores each account holder had since June 2006 is calculated based on a recording of all approved account switches.

Table 3: Summary Statistics on Account Management Behavior (0.5% random sample)

	Mean	10th Pct.	25th Pct.	50th Pct.	75th Pct.	90th Pct.	N
<i>Account Management</i>							
N Years in Current Afore (June 2006)	6.06	0.91	3.52	7.13	8.83	9.09	98,570
N Years of Affiliation (June 2006)	7.25	4.1	5.56	8.29	8.95	9.14	98,570
Number of Switches (2004-2006)	1.29	1	1	1	1	2	98,570
<i>Average Potential Flow Fee Gain</i>							
Currently Employed	0.89	0.76	0.88	0.92	0.98	1.03	38,908
Currently Unemployed	0.93	0.84	0.91	0.94	0.99	1.03	59,662
Always Unemployed	0.93	0.84	0.91	0.93	0.99	1.03	40,637
<i>Average Potential Balance Fee Gain</i>							
Currently Employed	0.28	0.11	0.15	0.18	0.41	0.49	38,908
Currently Unemployed	0.29	0.14	0.15	0.22	0.46	0.57	59,662
Always Unemployed	0.3	0.14	0.15	0.3	0.49	0.57	40,637
<i>Average Potential CEF Gain</i>							
Currently Employed	1.05	0.8	1.01	1.11	1.19	1.32	38,908
Currently Unemployed	1.13	1.01	1.11	1.13	1.22	1.32	59,662
Always Unemployed	1.14	1.01	1.11	1.13	1.22	1.32	40,637

Notes: Data taken from administrative data on social security account contributions from September 2004 through December 2006. Age is calculated from the birthdates attached to the account. Average wage is the average wage for the work across all periods they were employed during the sample period in December 2006 pesos. If the worker was unemployed during the entire period, the wage is last recorded wage inflated to December 2006 pesos. Account balance is the balance in each account in June 2006. Fraction of months not formally employed is the percent of months in our sample that the worker does not make a contribution to the social security account. Number of formal employers is a count of the number of unique employer id's that are recorded for each worker during the sample period, and the number of employees at each firm is calculated as the total number of employees for each unique employer id number that have wages and contributions in each period for the entire population of contributions in each month. The number of years in the current Afore is calculated for each participant as of June, 2006 based on the date they first registered with their current Afore. The number of years in the system is calculated for each person as of June 2006 and is based on the date they first contributed to the new privatized system. The number of Afores each account holder had since June 2006 is calculated based on a recording of all approved account switches.

Table 4: Summary Statistics on Affiliates and the Employment and Account Management Behavior (10% random sample at time of choice)

	Mean	10th Pct.	25th Pct.	50th Pct.	75th Pct.	90th Pct.	N
<i>Flow Fee Difference (New Afore - Old Afore)</i>							
Currently Employed	-0.14	-0.77	-0.33	-0.08	0.07	0.28	386,080
Currently Unemployed	-0.13	-0.78	-0.32	-0.07	0.08	0.30	114,735
<i>Flow Balance Fee Difference (New Afore - Old Afore)</i>							
Currently Employed	0.01	-0.35	-0.16	0.00	0.20	0.50	386,080
Currently Unemployed	0.01	-0.35	-0.15	0.00	0.16	0.45	114,735
<i>Flow CEF Difference (New Afore - Old Afore)</i>							
Currently Employed	-0.24	-1.32	-0.47	-0.09	0.12	0.37	386,080
Currently Unemployed	-0.21	-1.18	-0.51	-0.09	0.14	0.44	114,735
<i>Possible Additional Gains on Flow Fee</i>							
Currently Employed	0.74	0.00	0.52	0.80	1.05	1.14	386,080
Currently Unemployed	0.72	0.00	0.50	0.78	0.95	1.12	114,735
<i>Possible Additional Gains on Balance Fee</i>							
Currently Employed	0.29	0.00	0.15	0.35	0.40	0.50	386,080
Currently Unemployed	0.31	0.00	0.19	0.25	0.40	0.50	114,735
<i>Possible Additional Gains on CEF</i>							
Currently Employed	1.00	0.02	0.31	1.14	1.63	1.87	386,080
Currently Unemployed	1.04	0.04	0.34	1.33	1.63	1.92	114,735
<i>Possible Additional Gains in Daily Wage</i>							
	2.55	0.14	1.38	2.72	3.42	4.17	498,666

Notes: Calculations taken from a 10% random sample of affiliates who submitted applications to switch Afores during our sample period. For each worker, the complete choice set was constructed.

Table 5: Summary Statistics on Affiliates and the Employment and Account Management Behavior (10% random sample at time of choice)

	Mean	10th Pct.	25th Pct.	50th Pct.	75th Pct.	90th Pct.	N
<i>Change in CEF Rank (New Afore - Old Afore)</i>							
Pre Information Change	-0.04	-8.00	-4.00	1.00	4.00	7.00	140,804
Post Information Change	-2.41	-11.00	-7.00	-3.00	2.00	5.00	360,011
<i>Change in Balance Fee Rank (New Afore - Old Afore)</i>							
Pre Information Change	0.78	-10.00	-4.00	0.00	7.00	10.50	140,804
Post Information Change	-0.29	-9.50	-4.50	0.00	4.00	9.00	360,011
<i>Change in Flow Fee Rank (New Afore - Old Afore)</i>							
Pre Information Change	-1.13	-9.50	-5.00	-1.50	3.00	6.50	140,804
Post Information Change	-2.40	-11.00	-7.00	-2.50	2.00	6.00	360,011

Notes: Calculations taken from a 10% random sample of affiliates who submitted applications to switch Afores during our sample period. For each worker, the complete choice set was constructed.

Table 6: Discrete Time Hazard Model of Switching Afores by Employed Wage Category

	Wage < 25 th pctl.		Wage in 25-50 th pctl.		Wage in 50-75 th pctl.		Wage in 75-90 th pctl.		Wage >90 th pctl.	
	Coeff.	St.Error	Coeff.	St.Error	Coeff.	St.Error	Coeff.	St.Error	Coeff.	St.Error
<i>Demographics</i>										
Ave. Employed Wage (thousand pesos)	2.640**	0.216	1.178**	0.060	1.216**	0.024	1.070**	0.010	1.001	0.002
Male	1.034	0.058	0.984	0.032	1.060*	0.027	1.134**	0.033	1.204**	0.039
Age	1.038*	0.015	1.011	0.010	1.005	0.008	0.995	0.009	1.014	0.011
Age squared	0.999**	0.000	1.000**	0.000	1.000	0.000	1.000	0.000	1.000*	0.000
<i>Employment Status</i>										
Recently Unemployed	0.636**	0.081	0.773**	0.049	1.207**	0.058	1.899**	0.096	3.102**	0.168
Unemployed	0.124**	0.011	0.153**	0.008	0.157**	0.007	0.137**	0.007	0.115**	0.008
Entered Formal Sector	0.869	0.141	0.939	0.076	1.062	0.072	1.171	0.108	0.928	0.143
Switched Employers	0.838	0.260	1.124	0.118	1.112	0.088	1.047	0.114	0.793	0.119
<i>Peers and Employers</i>										
Afore Share at Employer	0.320**	0.057	0.320**	0.039	0.244**	0.027	0.258**	0.023	0.282**	0.023
Popularity of Initial Afore	0.534*	0.145	0.479**	0.088	0.867	0.126	0.939	0.138	1.251	0.207
Local Sales Force Concentration	1.144**	0.031	1.041*	0.018	1.044**	0.015	0.996	0.015	1.007	0.016
<i>Measures of Prices</i>										
Personal Flow Fee	0.950**	0.014	0.964**	0.008	0.982**	0.006	0.995	0.006	1.015*	0.007
Balance Fee	1.005	0.012	1.009	0.007	1.015**	0.005	1.008	0.005	1.017**	0.006
CEF	0.924**	0.016	0.908**	0.009	0.951**	0.007	0.965**	0.008	1.002	0.009
CEF* Post Info. Reform	1.233**	0.026	1.223**	0.015	1.147**	0.011	1.081**	0.011	1.027**	0.010
Mean Wage	1,072		2,405		3,872		6,981		19,278	
Dep. Variable Mean:	0.0020		0.0060		0.0102		0.0165		0.0215	
Log Likelihood:	-8,458		-23,181		-36,190		-32,212		-26,175	
N Obs.	688,597		688,532		688,675		413,278		275,561	

Notes: Results from a logistic discrete time hazard model. All regressions include Afore fixed effects, monthly fixed effects and dummies for length of time in current Afore at time t . Standard errors are clustered at the affiliate level.

Table 7: Estimated Elasticities with respect to Two Fee Measures

	CEF Elasticity	Cost Elasticity
Male	-0.265** (0.001)	0.066** (0.000)
Monthly Wage (1000 pesos)	-0.018** (0.000)	-0.005** (0.000)
Unemployed	-0.224** (0.001)	0.365** (0.000)
Post-Information Change	-0.821** (0.001)	0.116** (0.000)
Local Sales Force Concentration	-0.378** (0.005)	0.446** (0.003)
Sales Force* Post-Information Change	-0.011* (0.005)	-0.177** (0.003)
Mean in pre-period	0.16	-0.42
Mean in post-period	-0.65	-0.25
Observations	6,069,222	6,069,221

Notes: * significant at 5%; ** significant at 1%. All regressions include Afore fixed effects.

Appendix Table A.1. Entry Date and Description for Afores

Afore Name	Entry Date	Firm Description and Brand Perception
Actinver	Apr-03	Mexican financial group
Afirme Bajío	Dec-05	Mexican financial group
Ahorra Ahora	Aug-06	Owned by Mexican financial group Monex
Argos	Dec-06	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
De la Gente	Nov-06	Joint venture of small savings institutions and government bank (BANSEFI)
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	Mexican financial group
Metlife	Feb-05	International insurance company
Principal	Jul-97	International financial group
Profuturo GNP	Jul-97	Mexican mutual funds administrator
Santander	Jul-97	Spanish bank that bought the Mexican Bank Serfin in 2000
Scotia	Nov-06	International banking and financial services company
XXI	Jul-97	Owned by IMSS (former pension system administrator) and Prudential

*HSBC acquired Afore Alianz Dresdner in 2004 which was Afore Bancrecer Dresdner until 2001.**ING acquired Afore Bital in 2001. Bital is a Mexican bank.