Investor Decisions and the Financial Crisis in Mexico's Privatized Social Security Market

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Motivation

- Movement to give workers greater control over their pensions, personally manage their retirement wealth

    - Principle-agent problems, inefficiencies and looming solvency issues provide support for privatized, fully funded systems over government-managed pay-as-you-go social security systems

- Growing evidence that individuals may not make substantially wiser decisions when they manage their own accounts

    - Financial literacy research – evidence that many cannot demonstrate basic numeracy and economic skills to make basic investment –related calculations

    - Demand is sensitive to advertising, products are differentiated on non-price dimensions, system is not more efficient (Duarte and Hastings (2010), Hastings, Hortacsu and Syverson (2010))

- Financially literate also face decision-making errors that may negatively impact wealth at retirement

    - Overconfidence, return chasing, among others

        [See 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], among others]

Motivation

- Empirical evidence suggests that people may not be sufficiently adept decision makers to incentivize efficient markets
  - Be overly sensitive to default investment rules
    - Madrian and Shea (2001), Cronqvist and Thaler (2004), Choi, Laisbon and Madrian (2006), Beshears et al. (2008).
  - Influenced by advertising and irrelevant information
    - Cronqvist (2006), Choi, Laibson and Madrian (2007).
  - Overly-reliant on easily-available information as proxies for utility maximization
    - Brand name: McFadden (2006), Schleifer, Mullainathan and Schwartzstein (2008), Kling et al. (2008), Abaluck and Gruber (2009).
    - More salient/obvious/easy-to-calculate prices: Ausubel (1991), Liebman and Zechauser (2004), Chetty, Loney and Kroft (2008), Abaluck and Gruber (2009).
    - Peer opinion: Duflo and Saez (2003).
- Each short-cut may mitigate market incentives for efficiency; however little empirical evidence linking consumer behavior, firm response in above policy arenas

Overview of Project

☐ Use market crash, policy change, administrative and survey data to examine:

- ◘ How do account holders in Mexico's privatized social security system understand investment risk?
  - ■ How does this vary with financial literacy , education, age, income?
- ◘ How are their investment decisions affected by exposure to higher risk, negative returns?
  - ■ Does this vary with demographics
- ◘ How does experience of negative returns affect their value of savings for retirement?
  - ■ Measured through changes in formal/informal labor force participation

Background on Mexican Social Security System

- Privatized market in 1997 (SAR)
  - Objectives: make system financially viable, reduce inequality, increase retirement benefits given contributions through privatization
  - 6.5% of wages contributed to account, retirement at 60/65
  - Overseen by CONSAR
  - Over 25 million accounts in the system
- Government approved AFORES to administer individual accounts
  - 11-21 Afores competing for investor accounts at any point in system history, between 14 and 18 from March 2008 – Dec 2009 (our sample period)
  - Within Afore, Siefores are offered with restriction in investment risk

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

Afore Name	Entry Date	Exit Date	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

Background on Investment Regulations

- Since inception, several reforms on investment regulation of Siefores
  - 1 Siefore system - Siefore Basica 1 (SB1)
    - Could invest 100% in Mexican government bonds, up to 35% in Mexican corporate bonds with AA- rating or higher
  - 2 Siefore system – move in 2004 – SB1, SB2
    - Age based system – SB1 was 'low risk' for those over 55, and SB2 was 'high risk' for those 55 and under
  - Several investment restriction changes implied that by end of 2007, SB2 could invest up to 15% of net assets in major stock indexes (as ETFs and PPNs) and 20% in foreign debt with high rating.
- However, lack of performance relative to other investments, desire to increase account values led to new 5 Siefore system with investment possibilities in Structured Assets, real estate derivatives
  - SB1 – SB5, with SB5 the 'riskiest'
  - Age cutoffs at 25, 35, 45, 55
  - Workers were moved by age default into SB3-SB5 within their current Siefore in March of 2008

Background on Investment Regulations

- SB1 – SB5, allowed 15, 20, 30, 40% investment in equity indexes, up to 10% in structured assets
- Nearly 100% of account holders complied with default move to new Siefore
  - Hastings (2010) uses detailed household survey and finds that 24% of households had heard of Siefores, 8% of those knew that Siefores were meant to offer different investment risks
    - Those who knew both had over twice the average income and education as the sample (representative of population)
    - X% of sample are risk averse in hypothetical investment questions.
- Also, introduced new information format that presented 36 month past net returns in 1 column followed by fees, and gross returns in columns 2 and 3. Effort to emphasize choice on net returns to increase competition on net returns.
- Important to note that while this is a retirement account, it also serves as a unemployment insurance. Increased pro-cyclical risk for those most likely to need unemployment insurance.

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

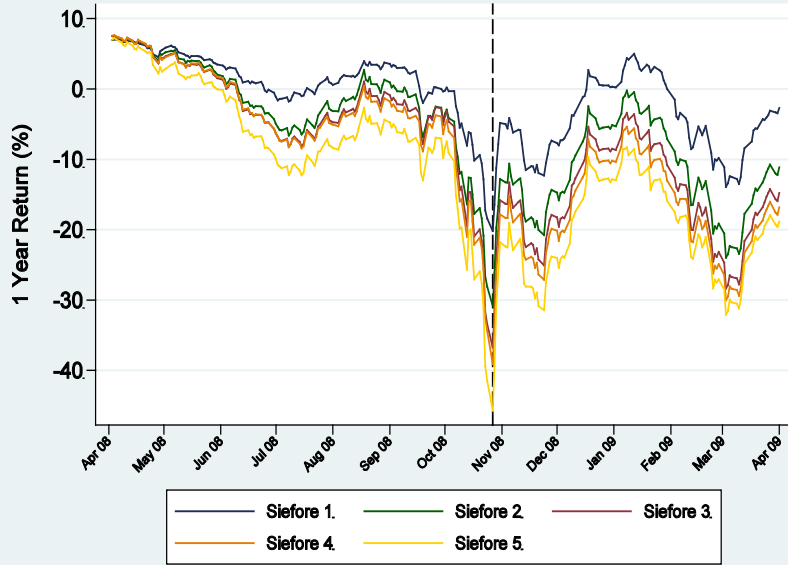Notes: Calculations by author based on investment category data from CONSAR.
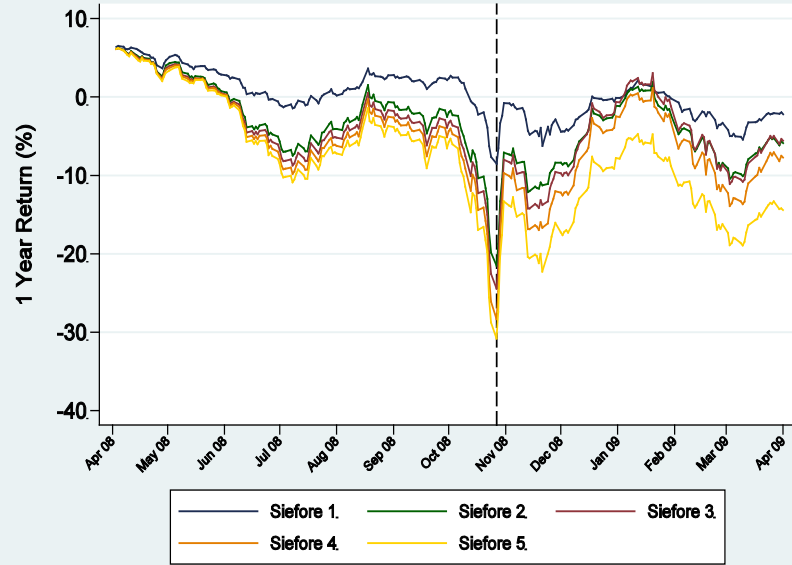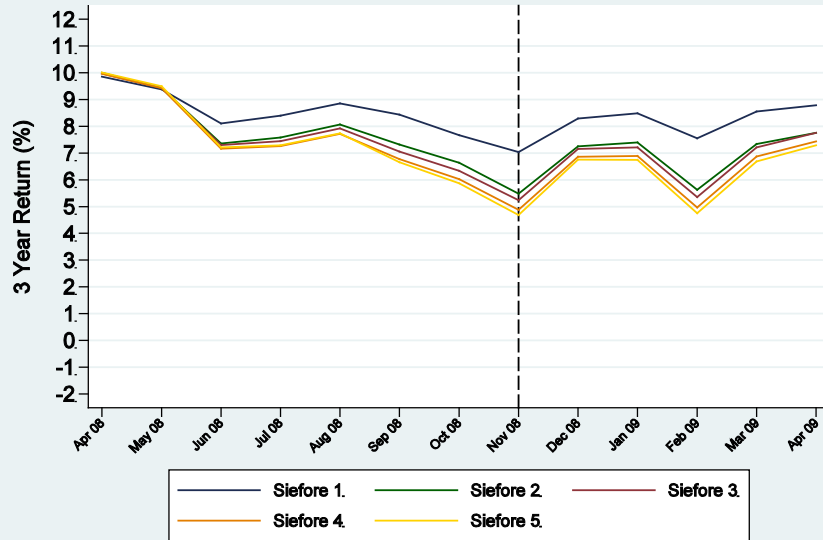
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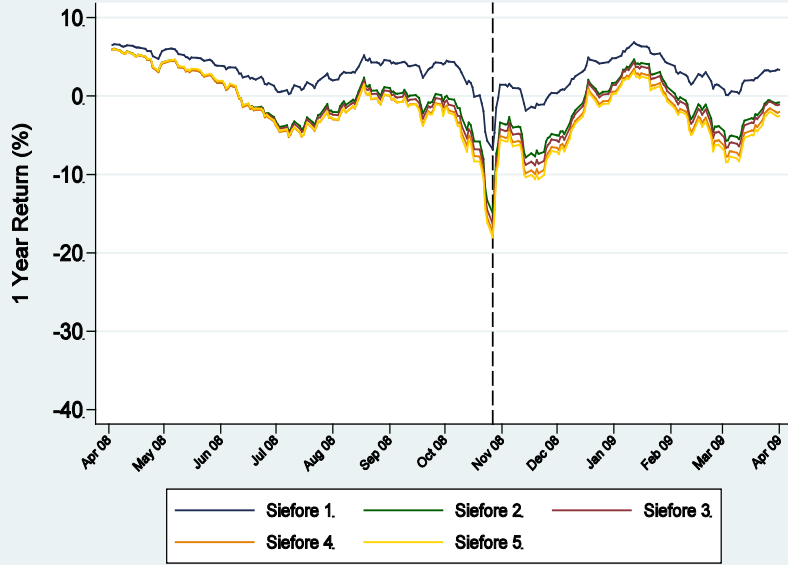
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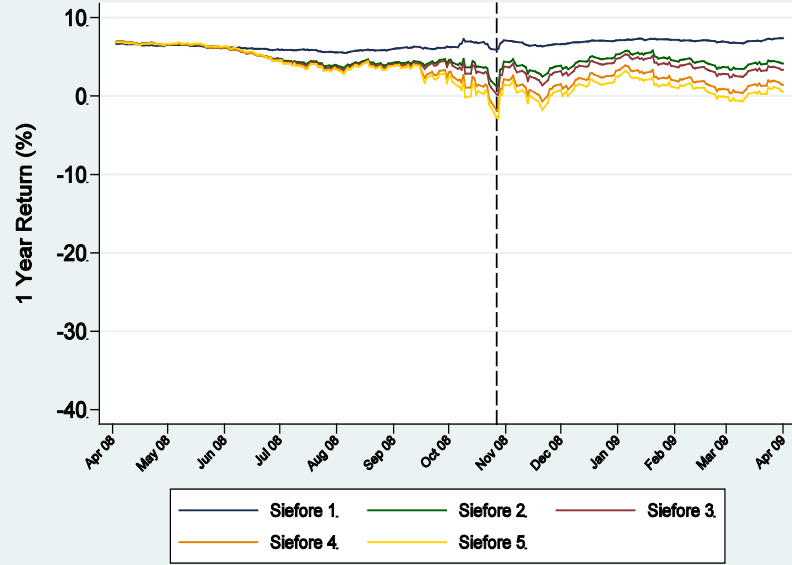
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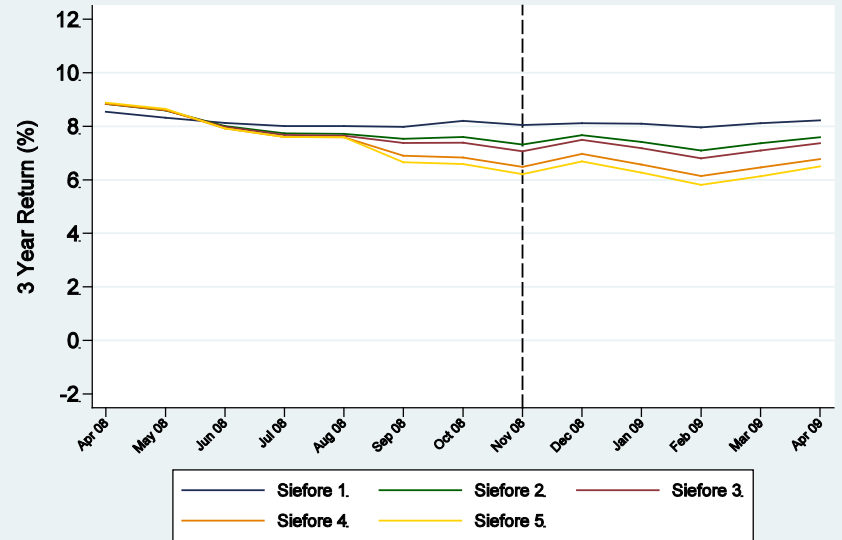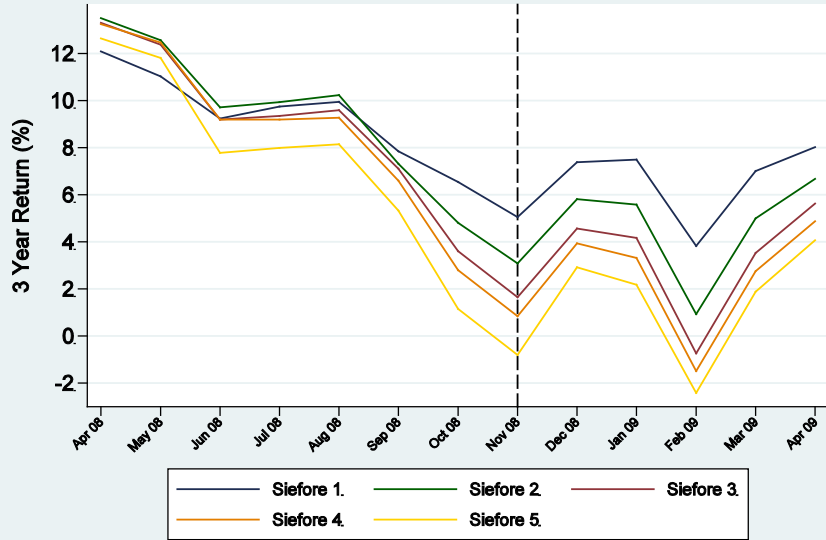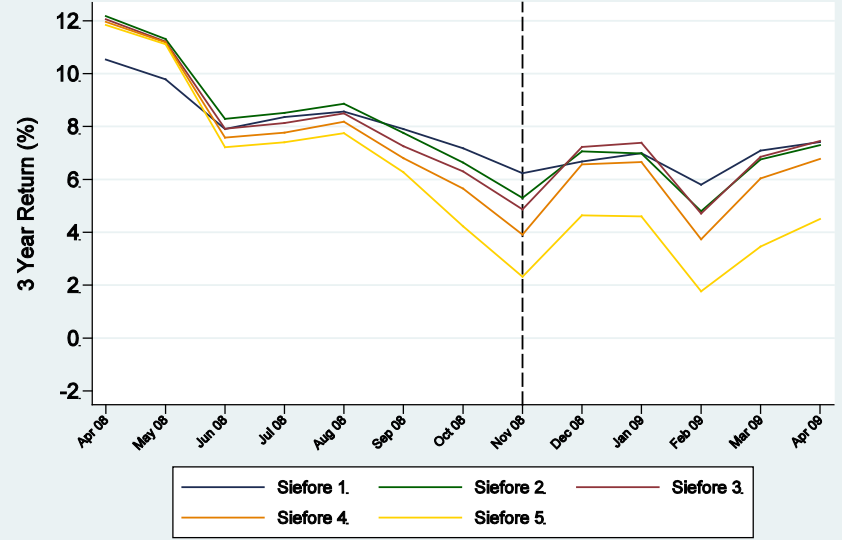
Data Description

- Combine several data sets
  - Administrative recording of all switches betweens funds/fund managers
  - Balances, demographics
  - Labor history, wages, contributions
  - New survey data from social security system in Mexico (not completely added yet)
- Use these data to examine how workers choose funds, how these choices vary with demographics, how workers choices changed after market crash

Summary Stats

Table 3: Demographic Characteristics of Mexican Pension System Affiliates

	Mean	10%	25%	50%	75%	90%	N
January 2007 - 25,876,210 Accounts							
Daily Wage[1]	196.1	58.4	77.7	119.4	207.3	404.9	23,783,000
Balance[2]	19,969	244	2,228	9,388	23,991	49,356	25,876,210
Percent Male	62.1%	-	-	-	-	-	25,876,207
Time in the System[3]	7.26	3.18	5.52	8.38	9.42	9.64	25,876,210
Time with Afore[4]	5.44	0.35	1.45	6.17	9.25	9.56	25,876,210
November 2009 - 26,292,010 Accounts							
Daily Wage[1]	194.8	58.7	77.3	117.4	205.1	407.5	25,284,702
Balance[2]	26,904	845	3,275	10,792	28,557	66,727	24,965,695
Percent Male	61.4%	-	-	-	-	-	26,292,010
Time in the System[3]	6.46	0.82	2.06	5.60	11.52	12.40	26,292,008
Time with Afore[4]	9.59	4.58	8.27	10.58	12.29	12.53	26,292,010

Notes: [1] Daily wage in Jan. 2009 Pesos. [2] RCV (Retirement & Disability) account in Jan. 2009 Pesos. [3] Years in the SAR system. [4] Years with current Afore.

How important are fees and returns?

$$U_{icjt} = \beta_c X_{icjt} + \varepsilon_{icjt}$$

- ☐ Construct choice set at time of choice
- ☐ Workers to choose funds based on fund characteristics:
  - ◻ Fees
  - ◻ Past returns
  - ◻ Afore 'quality' – time invariant brand dummies
  - ◻ Allow past returns to vary with pre-post market crash
- ☐ Estimate pooled model and by demographic cell

Table 4: Pooled Conditional Logit Results of Afore Choice at Time of Switching Between Afores

	Parameter Estimates
Lagged Fee[1]	-109.617
	(0.8689)**
Lagged 3 Yr Return[2]	26.879
	(0.3169)**
Post Market Crash*Lagged 3 Yr Return[3]	-3.974
	(0.4107)**
Observations	6067616
Mean Lagged Fee	0.0182
Mean Lagged Return	0.0762

Notes: Results from a conditional logit regression of afore chosen on fees and returns from the previous month, an interaction term, and afore dummies. Sample is all Afore switches between March 2008 and December 2009. [1]Balance fees charged at the afore level. [2]Three yr. nominal returns reported by CONSAR at the afore siefore level from the month prior to the date of the switch. [3] Lagged 3 yr. return interacted with a dummy variable for whether the switch occurred after November 2008 when the stock market crashed. Robust standard errors in parentheses. Std. errors clustered at the switching choice set level. * significant at 5%; ** significant at 1%.

Table 5: Ratio of Implied Preferences for Management Fees to Preferences for 36 Month Past Returns by Demographic Cell

Wage Quartile	Age	Male		Female	
		Pre-Market Crash	Post-Market Crash	Pre-Market Crash	Post-Market Crash
1	<=35	-8.846	-7.132	-8.769	-7.669
1	(35, 50]	-5.571	-8.198	-6.498	-6.917
1	> 50	-5.366	-6.718	-5.681	-6.298
2	<=35	-6.243	-6.672	-6.374	-8.143
2	(35, 50]	-4.693	-8.650	-4.981	-8.659
2	> 50	-4.093	-10.584	-4.100	-3.637
3	<=35	-3.698	-4.662	-3.663	-3.521
3	(35, 50]	-3.011	-4.666	-3.036	-4.027
3	> 50	-3.110	-4.432	-1.673	-2.385
4	<=35	-0.901	-1.309	-0.561	-0.625
4	(35, 50]	-0.842	-1.348	-1.023	-1.253
4	> 50	-1.435	-2.286	-0.232	-0.287

Notes: Each cell represents the coefficient on management fees divided by the coefficient on past returns from a conditional logit model of Afore choice. Each conditional logit model included Afore fixed effects, management fees, 36 month past returns as reported by CONSAR for the default Siefore for each individual as well as an interaction between past returns and an indicator for post-financial market crash time periods. The ratio can be interpreted as the decrease in management fees needed to offset the utility loss from a 1 percentage point increase in 36 month past returns

Concluding Thoughts

- High-income workers are more likely to chase past returns:
  - Hastings & Tajeda-Ashton (2008), Hastings (2010) both find that 25% of affiliates state "Past Returns" as primary reason for Afore choice
    - Significantly higher incomes and education levels
  - Both surveys also use a past returns question as a component of financial literacy measure
    - High income are much more likely to answer correctly, but also then say that they chose Afore based on past returns
    - Consistent with Choi, Laibson Madrian (2006).
- Important to understand if high-income workers have market-equilibrium spillovers to low-income workers
  - In Afore profit function, their demand is weighted by balance and flow into account.

Next Steps

- Use linkages to labor data to understand how account returns affect value of formal labor force participation
  - Are people who had exogenously large drops in account value more or less likely to continue employment in formal sector?
  - And if they attempted to withdraw UI post-crash?
- Completed survey data
  - Does risk experience change risk preferences, reasons for Afore choice, knowledge of the system?