ONLINE APPENDIX

for

Advertising and Competition in Privatized Social Security: The Case of Mexico*

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A.1 Main Tables

A.1.1 Appendix Table 1

Appendix Table 1 presents the first stage regression results for the instrumental variables regressions presented in Table IV from the main text. It shows the relationship between the municipality-level concentration of agentes for each Afore and our two instruments. The first three columns present results for the "neighbors' revenues" instruments; the last three show the "neighbors' wages".

The instrument enters positively into the regression in all cases, consistent with a model in which a demographic group's exposure to agentes in their market grows with the potential revenue for an Afore or the average wage in other demographic groups in the same municipality. Note that all regressions include demographic-geographic cell fixed effects, so the positive relationship between the instruments and the number of agentes holds across Afores even within a narrow slice of the market. Thus the first stage is not merely driven by aggregate profitability shocks (e.g., a particular Afore is in high demand across all groups and hires a large number of agentes to handle this client base). Rather, when a particular demographic group happens to be in a market full of other groups that are idiosyncratically profitable for an Afore relative to other Afores, that demographic will be exposed a larger number of *that* Afore's agentes in that particular market, but this need not be true in other markets. The narrowness of our identification improves our confidence that broader common demand shocks are confounding our instrumental variables estimates.

We further examine the relationship between our instruments and sales force exposure by allowing for nonlinearities (shown in the second columns of the respective instruments' panels in Table 5) and allowing the relationship between agentes and potential revenues/wages to vary across Afores (the third columns of the panels). The basic patterns hold. The revenue instruments might have nonlinear effects, with a stronger marginal impact at higher revenue levels. Both instruments see notable differences across Afores in the magnitudes of their relationships to agente sales force deployment. However, the Afore-specific relationships, when taking into account the baseline relationship, are still positive in every case.

A.1.2 Appendix Table 2

In Appendix Table II we explore some of these other possible factors that may have influenced brand value. These include foreign ownership, insurance vs. financial firm ownership, and ex-post realized first year returns. We note that the variation key to our simulations and results – the impact of sales force on price sensitivity and brand value – are identified separately from these factors. In addition these factors

may be endogenous and correlated with other factors. Indeed, for many of these factors, such as foreign ownership, there is effectively only one observation per Afore and therefore 17 effective observations in the data set.

We focus on a handful of factors that we could get data on. Appendix Table II shows two specifications; one in which the dependent variable is the residual brand value from our main specification in the text (column 2), and one in which we include agentes as we do in our main specification and add further independent variables (column 3). Column 1 presents our main specification from the text (Table IV column 3). Note that the coefficient on agentes concentration does not change between column 1 and column 3 of Appendix Table 3, speaking to the stability of our main IV estimates and robustness to inclusion of additional afore characteristics as dependent variables.

Columns 2 and 3 indicate that foreign-ownership has a negative impact on mean brand value as does an increase government owned assets. Column 2 shows that ex-post first year returns have a positive but insignificant impact on brand value. Column 3 allows ex-post first year returns to interact with sales force concentration. When we do this we find that in areas where an Afore had no sales force, the impact of first-year sales was negative and small. However, increased sales force increased the weight placed on this return measure, suggesting that agentes may have increased brand value by focusing investors on expected returns rather than fees. We note thought that these are ex-post one year returns, so it is unclear how agentes would have communicated this information ex-ante. It is the only measure available to us, and it does suggest a reasonable story.

A.1.3 Appendix Tables 3 through 6

Appendix Table 3 presents the mean elasticity calculations for Figure IV of the main text.

Appendix Table 4 presents changes in market shares and costs in the Neutral Agentes model as compared to the baseline model. This presents the statistics underlying Figure V in the main text.

Appendix Tables 5A and 5B present in table form the counterfactual simulations for prices, revenues and market shares with a Competitive Government Player assuming baseline and neutral impact of agentes on preferences, respectively.

Appendix Table 6 presents in table form counterfactual simulation results for the demand-side policy of increasing elasticity of the most inelastic quartile of the preference distribution.

APPENDIX TABLE I: OLS FIRST-STAGE ESTIMATES OF IMPACT OF INSTRUMENTS ON LOCAL AGENTE CONCENTRATION

Potential Instrument:	Neighbor Cell Revenues			Neighbor Cell Wages		
	(1)	(2)	(3)	(4)	(5)	(6)
Instrument	7.70e-05***	4.37e-05***	8.37e-05***	0.00331***	0.00269**	0.00421***
Instrument Squared		3.40e-09***			3.39e-06	
Instrument*Zurich			-5.74e-05***			-0.00293***
Instrument*Tepeyac			-5.59e-05***			-0.00252***
Instrument*XXI			-7.61e-05***			-0.00373***
Instrument*Banorte			-3.65e-05*			-0.00187*
Instrument*Dresdner			-4.24e-05***			-0.000783
Instrument*Profuturo			-4.00e-05***			-0.00151***
Instrument*Atlantico			-6.57e-05***			-0.00311***
Instrument*Principal			-6.25e-05***			-0.00337***
Instrument*Santander			3.96e-05***			0.00438***
Instrument*Previnter			2.60e-05*			0.00116
Instrument*ING			5.15e-05**			0.00313***
Instrument*Capitaliza			-5.74e-05***			-0.00295***
Instrument*Garante			4.47e-05***			0.00221***
Instrument*Inbursa			2.80e-05			-0.00102**
Instrument*Banamex			-5.01e-05***			-0.00214***
Instrument*Bancomer			-8.51e-06			-0.000258
Constant	-0.0396***	0.0293	-0.192***	0.0271	0.0516	-0.176***
Observations	62,883	62,883	62,883	62,883	62,883	62,883
R-squared	0.432	0.452	0.495	0.455	0.457	0.497
Number of cells	3,699	3,699	3,699	3,699	3,699	3,699
Afore Fixed Effects			Y			Y

Note: Standard errors are clustered at the Municipio level. Significance levels denoted by: ***p<0.01,**p<0.05,*p<0.1. Reported R-squared for columns (1), (2), (4) and (5) are the between R-squared estimates. For columns (3) and (6), within R-squareds are reported.

APPENDIX TABLE II: FIRM CHARACTERISTICS ON BRAND VALUE

	(1)	(2)	(3)
Dependent variable:	$\delta_{c,j}$	$\delta_{c,j}$-$\hat{\delta}_{c,j}$	$\delta_{c,j}$
Municipality agentes for Afore j per	10.37***		10.09***
1000 social security accounts	(0.221)		(0.388)
Municipality agentes for Afore j per			2.006***
1000 social security accounts X one-year return			(0.200)
Foreign owned		-2.538**	-2.650***
		(1.003)	(0.0592)
Insurance owned		0.0947	-0.009
		(0.957)	(0.0525)
Government owned assets		-0.340**	-0.235***
		(0.143)	(0.0108)
One-year return		0.138	-0.255***
		(0.422)	(0.0578)
Constant	-5.612***	34.60**	18.65***
	(0.0606)	(14.00)	(1.048)
Observations	59,184	59,184	59,184
R-squared	0.145	0.087	0.0894
Number of cells	3,699		3,699
Cell FEs	Y		Y
Instrument	Neighbor Cell Revenue by Afore		Neighbor Cell Revenue by Afore Interacted with Afore FEs, Afore FEs

Note: Significance levels denoted by: ***p<0.01, **p<0.05, *p<0.1. ($\delta_{c,j} - \hat{\delta}_{c,j}$) is the residual from the regression in column (1). Standard errors in column (2) are clustered at the Afore level. The model in column (3) instruments both the agentes concentration and the interaction term between agentes concentration and return. Reported R-squared for columns (1) and (3) are the R-squared from the mean-deviated regression. Firm characteristics are de--fined as follows:
Government owned assets is the mean proportion of government assets (BONDES91, UDIBONO, CETES, BONOS, PIC BONDES182, BONDES, BPA, UMS, and DEPBMX), measured in percentage terms, in the Afore's portfolio as reported by *CONSAR* from the periods August 1998- December 2000.
One-year return is the 12-month gross return from inception based on *CONSAR*'s August 1998 calculation of return.
Foreign owned and Insurance owned are dummy variables equal to 1 if at least one of the afore sponsor is a foreign owner and an insurance company, respectively.

APPENDIX TABLE III: CHANGE IN ELASTICITY WITH RESPECT TO COST UNDER DIFFERENT LEVELS OF SALES AGENTS

	Mean Sales Agent Concentration	SD Sales Agent Concentration	Mean Elasticity	Mean Elasticity with Neutral Agents
Genesis Metropolitan	0.146	0.194	-0.775	-1.922
Zurich	0.045	0.067	-0.747	-1.843
Tepeyac	0.202	0.167	-0.787	-1.976
XXI	0.148	0.142	-0.915	-2.127
Banorte Generali	0.351	0.372	-0.767	-2.046
Bancrecer Dresdner/HSBC	0.466	0.404	-1.076	-2.775
Profuturo GNP	0.397	0.207	-0.825	-2.274
Atlantico Promex	0.096	0.089	-0.873	-2.082
Principal	0.088	0.102	-0.556	-1.166
Santander	0.669	0.446	-0.911	-2.577
Previnter	0.22	0.233	-0.714	-1.785
ING/Bital	0.367	0.33	-0.708	-1.889
Capitaliza	0.041	0.069	-0.756	-1.847
Garante	0.6	0.381	-0.711	-1.993
Inbursa	0.222	0.198	-0.384	-0.78
Banamex	0.314	0.201	-0.682	-1.818
Bancomer	0.385	0.241	-0.63	-1.877

Note: Elasticities are calculated at the observed fee levels and individual characteristics. Elasticities in the Baseline Agentes model are calculated using estimates from equation 2 to generate the logit choice probability for each individual for each Afore. Elasticities for Neutral Agentes model use estimates for demand parameters with neutral agentes from equations 2, 3, and 4. Calculations are based on a 10% random sample of system affiliates.

APPENDIX TABLE IV: SIMULATED CHANGE IN COSTS BY AFORE FROM BANNING SALES AGENTS, HOLDING PRICES CONSTANT

Afore	Actual Market Share	Predicted Market Share with Baseline Agents	Predicted Market Share with Neutral Agents	Expected Revenues with Baseline Agents (1997 Pesos)	Expected Revenues with Neutral Agents (1997 Pesos)	Predicted Change in Revenue
Genesis Metropolitan	0.009132	0.009334	0.038051	26,908,734	84,489,150	213.98%
Zurich	0.002044	0.002034	0.028395	8,764,801	94,580,195	979.09%
Tepeyac	0.005518	0.005563	0.015601	17,270,717	38,944,346	125.49%
XXI	0.027344	0.027378	0.114794	182,257,169	500,087,617	174.39%
Banorte Generali	0.07703	0.077212	0.037213	238,983,409	81,990,346	-65.69%
Bancrecer/Dresdner/HSBC	0.045476	0.045406	0.024776	176,514,903	66,856,107	-62.12%
Profuturo GNP	0.113053	0.112004	0.036271	333,813,595	81,146,596	-75.69%
Atlantico Promex	0.01525	0.015133	0.097651	54,665,991	252,849,967	362.54%
Principal	0.009372	0.009405	0.145661	24,300,668	413,195,552	1600.35%
Santander	0.133964	0.134196	0.019314	457,387,405	46,856,742	-89.76%
Previnter	0.025698	0.025725	0.048282	100,759,317	128,244,899	27.28%
ING / Bital	0.091915	0.092364	0.06314	312,665,808	157,782,941	-49.54%
Capitaliza	0.002179	0.002133	0.03741	7,605,920	102,178,405	1243.41%
Garante	0.108248	0.107922	0.011832	363,166,277	28,087,499	-92.27%
Inbursa	0.029482	0.029422	0.107751	128,750,361	505,329,236	292.49%
Banamex	0.130994	0.131165	0.11341	555,406,220	367,072,786	-33.91%
Bancomer	0.173302	0.173604	0.060448	825,535,038	199,395,311	-75.85%
			Total	3,814,756,333	3,149,087,695	
				Total Revenue Change:		-17.45%

Note: Market shares in the Baseline Agentes model are calculated using the estimates from equation 2 to generate the logit choice probability for each individual for each Afore. Market shares for Neutral Agentes model use estimates for demand parameters with neutral agentes from equations 2, 3, and 4. Expected revenues are calculated using the predicted market share and expected costs. For each worker, expected costs are calculated by averaging projected costs, calculated using actual contributions, initial balance and wages over a 10 year period, in each year over workers with similar baseline characteristics. All calculations are based on a 10% random sample of system affiliates. Exchange rate in 1997 was 0.12 Pesos/USD.

APPENDIX TABLE VA: COUNTERFACTUAL SIMULATIONS WITH A GOVERNMENT COMPETITIVE FIRM AND BASELINE AGENT

				Govt. Player and Base Model				Govt. Player and Base Model				Govt. Player and Base Model			
	Base Model			Advertising (Cap I at 2.00,4.75)				Advertising (Cap II at 3.20, 5.00)				Advertising (Cap III - 3.20, 10.00)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Afore	Flow	Balance	Share	Flow	Balance	Share	% △cost Base Model	Flow	Balance	Share	% △cost Base Model	Flow	Balance	Share	% △cost Base Model
Genesis Metropolitan	2.00	0.00	0.93	2.00	0.00	0.98	5.56	2.20	0.00	0.97	15.28	2.15	0.00	1.01	20.41
Zurich	0.93	0.22	0.26	1.12	0.55	0.24	-8.16	1.30	0.00	0.26	2.72	1.15	0.40	0.26	8.55
Tepeyac	0.62	1.00	0.72	2.00	4.75	0.42	-0.69	3.20	5.00	0.39	7.09	3.20	10.00	0.36	12.06
XXI	1.90	0.00	2.87	0.00	0.01	6.08	-99.02	0.00	0.01	6.54	-98.91	0.00	0.01	6.74	-98.88
Banorte Generali	2.00	0.00	7.82	2.00	0.57	7.76	5.89	2.80	0.00	7.21	13.65	2.80	0.00	7.44	18.85
Bancrecer/ Dresdner/HSBC	0.03	4.75	5.49	2.00	4.75	4.26	1.07	0.30	5.00	5.48	10.85	0.05	5.85	5.55	15.05
Profuturo GNP	2.00	4.75	9.01	2.00	1.62	11.10	4.09	2.45	0.00	11.92	9.60	2.40	0.00	12.50	14.83
Atlantico Promex	1.72	0.00	1.70	2.00	0.00	1.67	2.05	2.15	0.00	1.66	11.81	2.10	0.00	1.73	16.63
Principal	2.00	0.00	0.80	2.00	0.00	0.83	2.56	3.20	5.00	0.58	24.90	3.20	10.00	0.53	32.79
Santander	1.50	1.78	15.54	2.00	2.75	13.81	2.16	2.10	1.50	15.16	10.25	1.85	2.05	15.76	16.20
Previnter	1.52	0.00	2.70	2.00	0.00	2.49	-0.67	2.10	0.00	2.53	10.05	2.10	0.00	2.62	14.56
ING/Bital	2.00	0.00	9.27	2.00	1.27	8.68	5.40	2.35	0.00	9.27	13.08	2.30	0.00	9.68	18.05
Capitaliza	1.48	0.00	0.24	2.00	0.00	0.22	3.01	1.90	0.00	0.24	15.09	1.85	0.00	0.25	20.15
Garante	1.92	0.00	10.94	2.00	0.80	10.45	4.18	2.45	0.00	10.52	11.62	3.20	10.00	6.98	19.74
Inbursa	0.25	2.83	1.90	0.25	4.62	1.61	-4.53	0.10	5.00	1.70	5.74	0.40	3.85	1.81	9.92
Banamex	2.00	0.00	12.86	2.00	0.62	12.57	1.79	3.00	0.00	11.29	6.65	2.80	0.00	12.05	11.58
Bancomer	2.00	0.00	16.96	2.00	0.45	16.81	1.06	3.20	0.00	14.31	5.18	3.20	0.00	14.73	8.91
Cap Total				2.75	4.75		-2.34	3.20	5.00		4.10	3.20	10.00		8.98

Note: Equilibrium and market share calculations are based on a 80,299 random sample plus a proportional random sample of new workers who entered the market over time, to capture growth forecasts in market size. Equilibrium fees and shares are calculated from an iterated best response method where best response functions are calculated over a 0.00025 grid-level increment in columns (1), (2), and (3), and over a coarser 0.0005 grid in columns (4) through (15). Market shares are calculated using estimates from equation 2 with costs calculated over the whole account horizon and discounted at a 5% rate.

APPENDIX TABLE VB: COUNTERFACTUAL SIMULATIONS WITH A GOVERNMENT COMPETITIVE FIRM AND NEUTRAL AGENT

				Govt. Player and Neutral Model Advertising (Cap I at 2.00,4.75)				Govt. Player and Neutral Model Advertising (Cap II at 3.20, 5.00)				Govt. Player and Neutral Model Advertising (Cap III - 3.20, 10.00)			
	Base Model														
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Afore	Flow	Balance	Share	Flow	Balance	Share	% △cost Base Model	Flow	Balance	Share	% △cost Base Model	Flow	Balance	Share	% △cost Base Model
Genesis Metropolitan	2.00	0.00	0.93	2.00	0.00	4.17	242.45	2.10	0.00	4.42	290.00	2.15	0.00	4.57	308.80
Zurich	0.93	0.22	0.26	1.70	1.10	2.78	922.41	1.95	0.45	3.05	1,037.20	1.80	0.95	3.13	1,095.90
Tepeyac	0.62	1.00	0.72	2.00	4.75	1.14	124.50	1.60	0.45	1.96	151.37	1.40	0.95	2.04	166.49
XXI	1.90	0.00	2.87	0.00	0.01	28.83	-97.05	0.00	0.01	30.76	-96.90	0.00	0.01	31.73	-96.84
Banorte Generali	2.00	0.00	7.82	2.00	0.00	4.36	-59.76	2.25	0.00	4.44	-54.24	2.30	0.00	4.58	-52.24
Bancrecer/ Dresdner/HSBC	0.03	4.75	5.49	0.57	3.50	3.56	-48.64	0.80	3.10	3.83	-42.40	0.75	3.15	4.01	-40.06
Profuturo GNP	2.00	4.75	9.01	2.00	0.20	4.41	-72.75	2.15	0.00	4.72	-69.10	2.15	0.00	4.91	-67.79
Atlantico Promex	1.72	0.00	1.70	2.00	4.75	8.57	549.97	3.20	5.00	7.82	619.16	3.20	10.00	7.08	683.20
Principal	2.00	0.00	0.80	2.00	4.75	7.33	1,051.50	3.20	5.00	6.71	1,205.40	3.20	10.00	6.11	1,358.60
Santander	1.50	1.78	15.54	1.65	0.82	2.52	-88.91	1.95	0.25	2.70	-87.60	1.75	0.75	2.76	-87.08
Previnter	1.52	0.00	2.70	2.00	0.00	4.69	23.54	3.20	0.00	3.86	36.21	3.20	0.00	4.02	41.55
ING/Bital	2.00	0.00	9.27	2.00	0.75	6.20	-45.34	2.60	0.00	6.35	-38.60	2.60	0.00	6.60	-35.83
Capitaliza	1.48	0.00	0.24	2.00	4.75	2.81	1,460.60	3.20	5.00	2.57	1,663.80	3.20	10.00	2.34	1,860.50
Garante	1.92	0.00	10.94	1.95	0.00	1.29	-91.68	1.85	0.00	1.46	-90.33	1.90	0.00	1.49	-89.98
Inbursa	0.25	2.83	1.90	2.00	4.75	2.32	41.21	3.20	5.00	2.15	58.87	3.20	10.00	1.99	75.64
Banamex	2.00	0.00	12.86	2.00	4.75	8.42	-25.46	3.20	5.00	7.70	-18.61	3.20	10.00	6.93	-14.08
Bancomer	2.00	0.00	16.96	2.00	0.00	6.60	-74.29	3.20	0.00	5.50	-70.94	3.20	0.00	5.70	-69.81
Cap Total				2.75	4.75		-36.51	3.20	5.00		-29.02	3.20	10.00		-24.18

Note: Equilibrium and market share calculation are based on a 80,299 random sample plus a proportional random sample of new workers who entered the market over time, to capture growth forecasts in market size. Equilibrium fees and shares are calculated from an iterated best response method where best response functions are calculated over a 0.00025 grid-level increment in columns (1), (2), and (3), and over a coarser 0.0005 grid in columns (4) through (15). Market shares in the Base Model are calculated using estimates from equation 2. Market shares for the Neutral Model are calculated using estimates for demand parameters with neutral agentes from equations 2, 3, and 4. Costs are calculated over the whole account horizon and discounted at a 5% rate.

APPENDIX TABLE VI: COUNTERFACTUAL SIMULATIONS WITH DEMAND-SIDE POLICIES

	Base Model			Increased Price Sensitivity + Basemodel Advertising				Increased Price Sensitivity + Neutral Model Advertising			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Afore	Flow	Balance	Share	Flow	Balance	Share	% △cost Base Model	Flow	Balance	Share	% △cost Base Model
Genesis Metropolitan	2.00	0.00	0.93	1.35	0.00	0.92	-37.20	1.50	0.00	3.48	90.36
Zurich	0.93	0.22	0.26	0.68	0.00	0.26	-33.70	1.35	0.00	2.61	488.64
Tepeyac	0.62	1.00	0.72	0.93	0.00	0.62	-39.43	1.23	0.00	1.57	33.63
XXI	1.90	0.00	2.87	0.85	0.00	3.66	-27.94	1.15	0.00	15.63	169.3
Banorte Generali	2.00	0.00	7.82	1.90	0.00	6.73	-37.88	1.25	0.00	3.97	-77.47
Bancrecer/Dresdner/HSBC	0.03	4.75	5.49	0.28	2.07	5.66	-38.52	0.28	2.23	3.31	-70.01
Profuturo GNP	2.00	4.75	9.01	1.98	0.00	10.28	-40.11	1.48	0.00	3.86	-84.49
Atlantico Promex	1.72	0.00	1.70	1.00	0.00	1.78	-35.30	0.85	0.00	14.03	324.17
Principal	2.00	0.00	0.80	0.77	0.00	1.10	-23.39	1.88	0.00	8.19	462.57
Santander	1.50	1.78	15.54	1.72	0.70	13.53	-40.58	1.20	0.10	2.38	-93.47
Previnter	1.52	0.00	2.70	0.75	0.00	3.12	-28.25	0.77	0.00	5.42	-15.00
ING/Bital	2.00	0.00	9.27	1.5	0.00	8.74	-38.34	1.32	0.00	5.95	-71.12
Capitaliza	1.48	0.00	0.24	0.52	0.00	0.32	-17.42	0.70	0.00	5.16	1,096.80
Garante	1.92	0.00	10.94	1.08	0.00	11.7	-34.71	0.62	0.00	1.60	-94.24
Inbursa	0.25	2.83	1.90	0.47	0.50	2.49	-21.96	0.47	0.45	4.45	8.46
Banamex	2.00	0.00	12.86	1.25	0.00	13.09	-37.59	1.00	0.00	12.54	-55.60
Bancomer	2.00	0.00	16.96	1.45	0.00	15.98	-40.48	1.35	0.00	5.84	-85.59
Total % change in cost:							-37.33				-49.09

Note: Equilibrium fees are calculated from an iterated-best response method using a random sample of 80,229 workers plus a proportional random sample of new workers who entered the market over time, to capture growth forecasts in market size. These calculations use a new price-sensitivity parameter,$\alpha_c^{new} = \alpha_c - \sigma_\alpha I_{\{\alpha_c \geq \alpha_{75}\}}$; where, σ_α is the standard deviation of the estimated price sensitivity parameter, α_{75} its 75-th percentile and I denotes the usual indicator function. Cost calculations are discounted at a 5% rate in the equilibrium-fee calcula-tion, and are calculated over the full account horizon.

A.2 Investment Regulations and Performance

We compile Siefore share prices from CONSAR website and calculate 30 day returns by Afore. We use the interest rate on a 28 day CETES federal treasury certificates as the short-term risk-free rate, the 30 day return on the Mexican stock exchange index (Mexbol), and the Mexico fixed bond auction rate for 10 year bonds, all available from Bloomberg. Mexbol and Mexican bond rate data series begin in 2000, so we restrict our analysis from 2000 through 2011. We regress monthly Siefore returns net the risk free returns on Mexican stock market and bond returns net the risk free rate by Afore for each Siefore. Tables A1.1 and A1.2 below show the coefficients of this regression for each of the Afores for Siefore Basíca 1 and Siefore Basíca 2. We try a handful of alternate specifications that allow the coefficients on bond and equity indices to vary with regulatory changes in caps on various investment vehicles. The estimates for Alpha are similar across the specification checks.

APPENDIX TABLE VII: PERFORMANCE OF MONTHLY RETURNS TO SIEFORE BASÍCA 1 BY AFORE

	Alpha		Beta Bonds		Beta Equity Index		N
Actinver	-0.0070	(0.004)	0.393	(0.052)**	0.544	(0.051)**	57
Azteca	-0.0030	(0.003)	0.358	(0.047)**	0.505	(0.042)**	98
Banamex	0.0000	(0.003)	0.362	(0.042)**	0.521	(0.036)**	118
Bancomer	0.0000	(0.003)	0.369	(0.042)**	0.514	(0.036)**	118
Banorte Generali	-0.0010	(0.003)	0.364	(0.041)**	0.520	(0.035)**	118
HSBC	-0.0010	(0.003)	0.379	(0.041)**	0.504	(0.036)**	118
Inbursa	0.0000	(0.003)	0.432	(0.038)**	0.447	(0.033)**	118
ING	0.0000	(0.003)	0.378	(0.042)**	0.509	(0.036)**	118
Invercap	0.0040	(0.004)	0.145	(0.066)*	0.467	(0.054)**	75
Ixe	0.0030	(0.005)	0.202	(0.073)**	0.365	(0.058)**	58
Metlife	0.0050	(0.004)	0.194	(0.062)**	0.408	(0.050)**	75
Principal	0.0000	(0.003)	0.378	(0.041)**	0.507	(0.036)**	118
Profuturo GNP	-0.0010	(0.003)	0.373	(0.042)**	0.513	(0.036)**	118
Santander	-0.0030	(0.003)	0.393	(0.045)**	0.528	(0.039)**	77
XXI	0.0000	(0.003)	0.375	(0.041)**	0.510	(0.036)**	118

Notes: Standard errors in parentheses. * significant at 5%; ** significant at 1%

APPENDIX TABLE VIII: PERFORMANCE OF MONTHLY RETURNS
TO SIEFORE BASÍCA 2 BY AFORE

	Alpha		Beta Bonds		Beta Equity Index		N
Actinver	-0.0010	(0.003)	0.210	(0.059)**	0.351	(0.054)**	44
Azteca	0.0010	(0.004)	0.213	(0.055)**	0.432	(0.047)**	84
Banamex	0.0010	(0.004)	0.173	(0.055)**	0.473	(0.048)**	84
Bancomer	0.0000	(0.004)	0.203	(0.056)**	0.459	(0.049)**	84
Banorte Generali	0.0000	(0.004)	0.208	(0.055)**	0.449	(0.048)**	84
HSBC	0.0010	(0.004)	0.216	(0.056)**	0.435	(0.049)**	84
Inbursa	0.0020	(0.003)	0.290	(0.049)**	0.355	(0.042)**	84
ING	0.0010	(0.004)	0.202	(0.056)**	0.464	(0.049)**	84
Invercap	0.0030	(0.004)	0.093	(0.066)	0.546	(0.054)**	75
Ixe	0.0010	(0.005)	0.164	(0.072)*	0.421	(0.057)**	58
Metlife	0.0040	(0.004)	0.156	(0.063)*	0.460	(0.051)**	75
Principal	0.0010	(0.004)	0.213	(0.054)**	0.449	(0.047)**	84
Profuturo GNP	0.0010	(0.004)	0.187	(0.057)**	0.485	(0.050)**	84
Santander	-0.0040	(0.003)	0.169	(0.061)**	0.413	(0.056)**	43
XXI	0.0010	(0.004)	0.215	(0.056)**	0.449	(0.048)**	84

Notes: Standard errors in parentheses. * significant at 5%; ** significant at 1%

A.3 Numerical Calculation of the Nash-Bertrand Game in Balance and Flow Fees

This section details the computational techniques to solve for a Nash equilibrium in flow and balance fees. We begin by formalizing the Bertrand game on balance and flow fees. Afore j's expected revenue as a function of flow fees, balance fees (f_j and b_j), horizon expectations, and a vector of advertising levels $(A_j)_{j\in J} \equiv \left(A_j^{(i)}\right)_{i\in I, j\in J}$ is given by

$$\pi_j(f_j, b_j, A_j, f_{-j}, b_{-j}, A_{-j}|h_j) = \sum_{i\in I} \rho_{ij}(f_j, b_j, A_j, f_{-j}, b_{-j}, A_{-j})\, p_i(f_j, b_j|h_j)$$

Where $A_j^{(i)}$ is the agente concentration that individual i is exposed to, I denotes the set of individuals and J is the set of all seventeen afores. $\rho_{ij}(f_j, b_j, A_j, f_{-j}, b_{-j}, A_{-j})$ is the logit demand estimate (i.e., the probability that the i chooses afore j) and is given by

$$\rho_{ij}(f_j, b_j, A_j, f_{-j}, b_{-j}, A_{-j}) = \frac{\exp\left[\lambda_{ij}\left(A_j^{(i)}, A_{-j}^{(i)}\right) c_i(f_j, b_j) + \delta_{ij}\left(A_j^{(i)}, A_{-j}^{(i)}\right)\right]}{\sum_{\mathrm{j}\in\mathrm{J}} \exp\left[\lambda_{ij}\left(A_j^{(i)}, A_{-j}^{(i)}\right) c_i(f_j, b_j) + \delta_{ij}\left(A_j^{(i)}, A_{-j}^{(i)}\right)\right]}$$

Here $p_i(f_j, b_j|h_j)$ is the present value of the revenue stream generated by the ith individual conditional this individual staying with the afore for at least h_j horizons, and $c_i(f_j, b_j)$ is the present discounted total fees that i pays j for management services (c_i equals p_i if the account holder's and the afore's time horizons).[1]

Given a vector of advertising level A and a vector of expected account horizons $(\mathrm{h_j})_{\mathrm{j}\in\mathrm{J}}$, a Nash-Bertrand equilibrium in this game is a vector of fees such $(f_j, b_j)_{\mathrm{j}\in\mathrm{J}}$ that

$$(f_j, b_j) \in argmax_{(f_j, b_j)\in[0,\bar{f}]\times[0,\overline{b_j}]}\, \pi_j(f_j, b_j, A_j, f_{-j}, b_{-j}, A_{-j}|h_j)$$

for each afore $j \in J$. This Bertrand game differs from the standard logit-bertrand pricing game in a couple of nontrivial manner that complicates numerical calculation of an equilibrium. First, some firm's maximization problems need not be convex. The lack of concavity in the profit function arises from the fact that afores compete over a substantial number of individuals who are price insensitive (those with low or positive price elasticities) causing some afores to best-respond by focusing their attention to these

[1] $p_i(f_j, b_j|h_j) = \left(\frac{1}{1.05}\right)^{\min\{T_i, h_j\}}\left(F_{i,h_j} - R_{i,h_j}\right)$. R_{i,h_j} is the value of i's account in h_j after deducting management fees and is given by $R_{i,h_j} = \sum_{t=1}^{\min\{T_i,h_j\}}\left[(0.065 - f_j)s_{it} + cs_{it}\right]\left(1 + \frac{.05-b_j}{2}\right)(1.05 - b_j)^{\min\{T_i,h_j\}-t} + sar92_i(1.05 - b_j)^{\min\{T_i,h_j\}}$, where T_i is the years to retirement for person i, s_{it} is i's salary in year t, cs_{it} is the government contribution given to the individual in date t, and $sar92_i$ is the individual's account balance at inception. Here F_{i,h_j} is the value of i's account in h_j years if fees were set to zero.

individuals and charging high fees.

Appendix Figure I.A illustrates this scenario for XXI, which shows regions of con- cavity (low fee levels) and convexity (high fee levels) for XXI's profit function, and Appendix Figure I.B graphs XXI's profit function when agents with positive price elasticity are eliminated from the sample.[3] These surface plots further suggest that afores possibly best-respond on the boundaries. In particular, firms that find it optimal to compete for the agents with inelastic demand charge the largest possible fees while other firms may choose to set only one type of fee (i.e., either balance fee or flow fee is set to zero).

Given that some afores best respond by charging fees on the boundary, solutions to the zeros of the gradient of the profit functions may not exist. Admittedly, one can include the appropriate equations that (necessarily) characterize the boundary solution (i.e., Karush-Kuhn-Tucker (KKT) complementary slack-ness conditions) in the system of gradient equations; however, solutions to these conditions need not be an equilibrium given the nonconvexity of the afores' profit functions. In other words, if one were to use variants of the newton method to solve for zeros of the afores' KKT optimality conditions then the solver may converge to a solution that satisfies this condition, but the calculated fees for some afores need not be the best-response fees. For example, if there is a unique equilibrium solution in which *k* afores find it optimal to set fee equal to the high-fee boundary and exhibit profit functions similar to Appendix Figure I.A, then any Newton-like solver could potentially converge to $\sum_{i=o}^{k} \binom{k}{i} 2^i$ and at least 2^k points.

For the reasons outlined above, our numerical strategy disposes of the (necessary) gradient characterization of an equilibrium. We employ a best-response iteration algorithm (henceforth, BR iteration) to solve for the equilibrium fees, and we find an intuitively appealing solution that survives the iterative best-response test. To be exact, we use a Gauss-Seidel BR-iteration algorithm, in which afores simultaneously best respond at every iteration, and find no converges issue in all of our numerical implementation.[2] We suspect that convergence of the algorithm is largely attributed to the fact that the game roughly exhibits Nash diagonal dominance. [3] Our calculations suggest that the solution found under

[2] The simultaneous best-response iteration (Jacobi) method fails to converge and oscillates be- tween high and low fee best responses in some of our computations. Given that afores could possibly compete for two different type of consumers such oscillating behavior is unsurprising. When firms best-respond simultaneously from a low-fee iteration, many firms find it optimal to charge high fees and focus on the price-inelastic consumers. Since competition for the price- intensive consumer is strong at this iteration, firms find it optimal to compete for majority of the accounts/agents and best respond by charging low fees in the next iteration.

[3] We do not claim that the Hessian of the revenue functions satisfy diagonal dominance everywhere on the interior of the box $[0, \bar{f}]^{17} \times [0, \bar{b}]^{17}$. Though diagonal dominance is a sufficient condition for the BR-iteration algorithm to converge (the mutual best-response function form con-traction under Nash diagonal dominance) it is by no means a necessary condition. We conjecture that there is enough diagonal dominance in the Hessian in some regions that increases the likelihood of the BR-iteration algorithm converges. For example, Table AIII.1 lists the absolute values of the flow-fee gradient of the first-order conditions with respect to flow fees evaluated at the observed fee levels.

this sequential best-response algorithm appears to be robust across changes in the order by which firms best respond and initial starting value, leading us to suspect that no other equilibria of this game exists where some firms best respond by setting fees equal to the upper boundary.

Our numerical solution does not preclude the existence of other equilibria that are not found under the sequential best-response algorithm. We argue, however, that the existence of an equilibrium where some afores choose to compete for the individuals with inelastic demand and charge the highest possible fees eliminates the possibility of an equilibrium where firms compete for the majority of the account (i.e., an equilibrium where no firms best respond on the upper boundaries). To see this, suppose on the contrary that there are two such equilibrium, say $\left(f_j^*, b_j^*\right)_{j\in J}$, where firms set J^* play on the upper boundary, and $\left(f_j', b_j'\right)$ where no firm plays on the boundary in this equilibrium (i.e, $f_j < \bar{f}$ and $b_j < \bar{b}$ for every afore $j \in J$). In the equilibrium $\left(f_j', b_j'\right)_{j\in J}$, firms compete for the majority of the account, say individuals with $\lambda_i < 0$, so that an afore's payoff exhibits strictly increasing differences in the other afores' fees (i.e., the game exhibits strategic complementarity). Hence, it must be the case that in such an equilibrium $f_j' < f_j^*$ and $b_j' < b_j^*$, which imply stronger competition in the market for consumers with elastic demand. In this equilibrium, the incentive for firms in J^* to focus on the niche market (the $\lambda_i \geq 0$ individuals) increases relative to its incentive in the equilibrium $\left(f_j^*, b_j^*\right)_{j\in J}$, which contradicts the statement that $\left(f_j', b_j'\right)_{j\in J}$ for afore $j \in J^*$ are best-response fees against the fee levels $\left(f_j', b_j'\right)_{j\in J\setminus\{j\}}$.

As an additional robustness check, we use the KKT conditions to numerically formulate the problem as a square complementary problem and employ the PATH algorithm (Ferris and Munson, 1998) through AMPL to solve for these conditions. As previously discussed, the solver may converge to flow fees that satisfy the KKT conditions but are not equilibrium fees. To aid the direction of the solver, we impose a higher lower bound on fees for firms that we find best responding on the upper boundaries in the equilibrium found under the sequential best-response algorithm.[4] Using this approach, we find that the

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With the exception of three firms, the marginal effects on the Afores' first-order conditions in fees are dwarfed by the marginal effect to changes in its own flow fees. We calculated the Hessian in various points and surmise that this feature is not fee specific.

[4] To be exact, the complementary condition for the firms that set the highest possible fees in equilibrium admit the following expression:

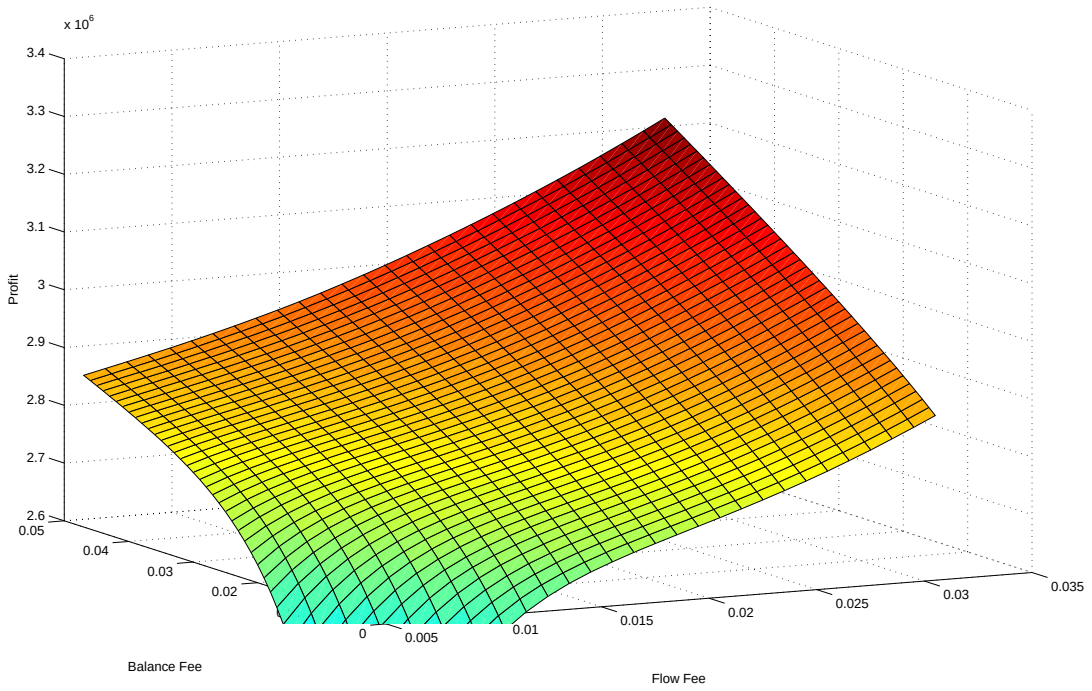
$$\nabla_{(f_j,b_j)}\pi_j(f_j,b_j)+\lambda_L-\lambda_H = 0$$

$$0_2 \leq \lambda_L \perp ((f_j,b_j)-(f_L,b_L)) = 0_2$$

$$0_2 \leq \lambda_H \perp ((f_j,b_j)-(\bar{f}_j,\bar{b}_j)) = 0_2$$

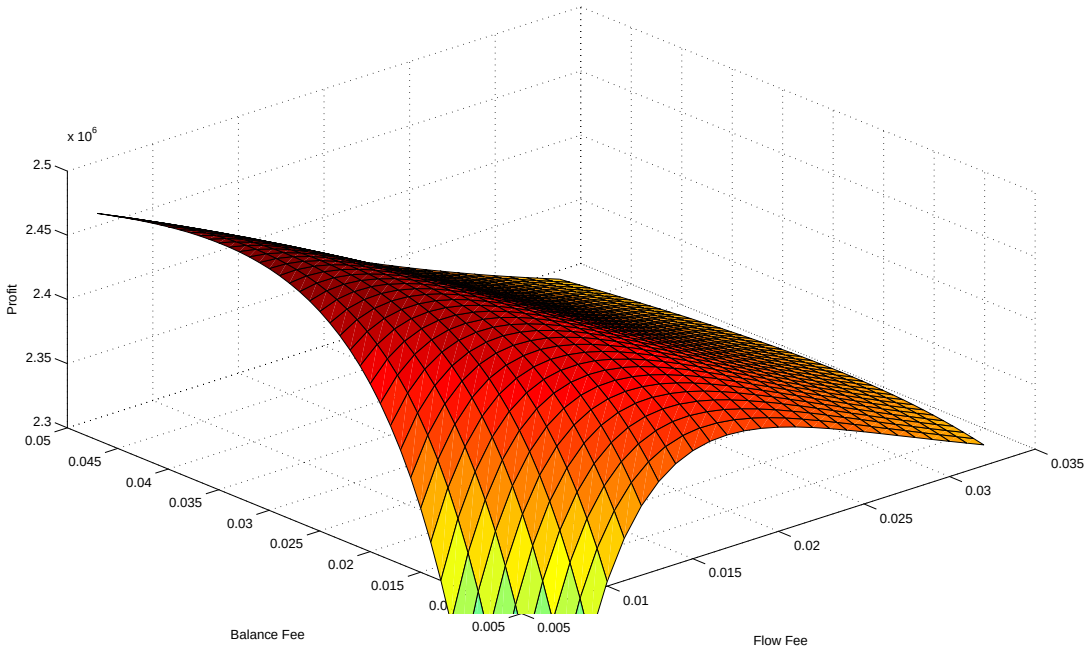
solver converges to a solution that is approximately equal to the equilibrium fees calculated using the sequential best-response iteration.

APPENDIX FIGURE 1.A:
ILLUSTRATION OF NON-CONVEXITIES
IN AFORE PROFIT FUNCTION, BASELINE DEMAND MODEL



for some $(fL,bL) \gg 0$. The lower bound of the fees is set to zero for the other firms.

APPENDIX FIGURE 1.B:
ILLUSTRATION OF CONVEX AFORE PROFIT FUNCTION,
MODEL WITH NEUTRAL AGENTES AND DEMAND-SIDE POLICY



A.4 Construction of Expected Costs

To estimate demand as a function of management fees, when there are multiple fees charged to account holders, we calculated the cost over 10 years using each individual's contribution history from 1997 through 2007. However, if individuals do not perfectly forecast their labor force participation and earnings at the point of choosing a fund manager in 1997, using this measure of management cost may introduce measurement error that is correlated with the true underlying cost expectations individuals use to choose an Afore. This measurement error bias would lead us to understate the weight that individuals place on costs when choosing fund managers. Hyslop and Imbens (2000) show that measurement error generated by using a prediction of cost as the cost measure of interest (the Optimal Prediction Error) circumvents this source of estimation bias, as prediction error is orthogonal to the cost itself and the error term.

In addition, if plan or product choice causes subsequent usage, perfect foresight costs may be endogenous (See for example, Miravete 2003, Heiss McFadden and Winter 2010, Abaluck and Gruber 2011, Handel 2011, Einav et al. 2011, Grub and Osborne 2012, and Jiang 2012, Duarte and Hastings 2012). A priori, fund manager choice is much less like likely to cause future labor force participation than health care plan choice is likely to cause subsequent use of different health services or cell phone plan is likely to cause calling behavior. However, we find that our estimated demand elasticities calculated using actual (perfect-foresight) costs are smaller in absolute value than those using predicted costs.

Our rich individual-level data, variation in management costs across individuals, and incredibly large sample size allus to calculate an expected cost for each individual in each year using a predicted number of days worked each year and the expected wage earned over people with very similar characteristics at the start of the system. We can then re-estimate our model using this alternative cost measure free from the potential measurement error bias outlined above. Our predicted cost is constructed by taking cell-level means (or expectations since cell means are equivalent to regression predictions from regressions of costs on cell dummies) over finely defined cells by state of residence, age, wage, gender, starting SAR92 balance, wage and number of days worked in the first year of the system.[1] We broke these categories into fine

[1] We also explored more parametric regression functions using linear, quadratic and cubic terms of characteristics and their interactions. Taking cell level means avoids overshooting predictions in tails often resulting from

enough cells to have approximately 100 workers per cell (the median cell has 97 workers). We then took the average number of days worked and wage level in each subsequent year over all workers in each cell, and assigned to each worker this cell-level mean. We then used these two means and the initial SAR92 balance to mechanically calculate management fees for each worker with each Afore given the Afore fee structure in 1997.[2] We then re-estimate our demand model using this expected cost measure.

Overall, the results using expected costs differ in predictable ways from results using perfect foresight/realized labor market outcomes. When calculating price elasticities, we find that demand is more elastic overall than it is in the perfect foresight mode, however the the change in elasticity from the model estimated on the actual data and the simulated model imposing zero impact of agente promotores is very similar. We find slightly lower demand-side cost savings in our counterfactual - 14% relative to 17%, since demand elasticity levels are lower using the perfect foresight cost measure.

Additional References:

Hyslop, Dean R. and Guido Imbens. (2000). "Bias from Classical and Other Forms of Measurement Error." National Bureau of Economics Technical Working Paper #T0257.

estimating regressions with many cubic and quadratic terms, and since we have the sample size to do it we decided on the cell means approach.

[2] Note we still assume workers assume current fees to hold going forward, though this seems a reasonable assumption.

A.5 Sample Television Advertisements from the Market Inception

A.5.1 Example 1

Video[1]: http://www.youtube.com/watch?v=lieVrXkZ3G8&feature=player_detailpage#t=253s

En Español:

Desorientada?

Te preocupa el futuro?

No te hagas bolas, llama al servicio telefónico de Afore Banamex

Ellos te van a orientar,

Llámalos! se trata de tu retiro

Contestadora: Afore Banamex a su servicio?

Por sus accionistas y empleados

Afore Banamex nace con experiencia

In English:

Confused?

Are you concerned about the future?

Don't get confused! Call the Afore Banamex's call center

They are going to guide you

Call them! it's your retirement!

Call center: Afore Banamex, how can I help you?

For its stakeholders and employees

Afore Banamex born with experience.

A.5.2 Example 2

Video[2]: http://www.youtube.com/watch?v=BUv3SL5VsOU

En Español:

Aja! Con que ya se enteraron del Afore Banamex,

[1] Last accessed on February 24, 2013.
[2] Last accessed on February 20, 2011.

Psss, Hey tu, que no piensas retirarte?

Hormiga: Yo? No!

Te da flojera pensar en tu futuro?

Todos ya están listos

Si pierdes tiempo, pierdes dinero

Tu futuro depende de ti

Afíliate ya, que si no te apuras… se te va el camión

Por sus accionistas y empleados

Afore Banamex nace con experiencia

In English:

Aha! So you already know about Afore Banamex,

Psss, Hey you, aren't you planning on your retirement?

Ant: me? No!

Are you lazy to think of your future?

Everybody is ready

If you lose time, you lose money.

Your future relies on you

Enroll now! 'cause if you don't hurry up… you will miss the train.

For its stakeholders and employees

Afore Banamex born with experience.

A.5.3 Example 3

Video[3]: http://www.youtube.com/watch?v=SX6l_mcAE1I

En Español:

Ajaja, todas con afore Banamex, y tú qué?

Guardaras ahí tu lana? Para el futuro?

No confías en nadie eh?

Ten confianza de que en Afore Banamex, tu dinero para el retiro está seguro

[3] Last accessed February 24, 2013.

Ándale! Decídete ya, la experiencia de afore Banamex da seguridad

Por sus accionistas y empleados

Afore Banamex nace con experiencia

In English:

Ahaha, everybody (female) with Afore Banamex, and you?

Are you going to put your money there? For your future?

You don't trust in anybody, eh?

You should trust that in Afore Banamex, your money for your retirement is protected

Como on! Make your mind up now! The Afore Banamex's experience provides security.

For its stakeholders and employees

Afore Banamex born with experience.

A.6 System Background: Further Details

A.6.1 Applicants and the Application Process

Mexico instituted its current privatized social security system on July 1, 1997. The system established individual ownership over retirement account contributions, and was designed to reform the previous pay-as-you-go system in a way that would increase financial viability, reduce inequity, and increase the coverage and amount of pensions.[4] The government approved private investment managers, the Afores mentioned in the text, to manage the individual accounts and established CONSAR (*Comision Nacional del Sistema de Ahorro para el Retiro* [National Commission of the System of Savings for Retirement]) to oversee this new *Sistema de Ahorro para el Retiro* (SAR – System of Savings and Retirement).

Firms that applied to be Afores needed to meet minimum capital requirements and have experience in the financial sector in Mexico. Potential Afores submitted feasibility studies to demonstrate a viable business plan that would be profitable in ten years at a rate of return for a competitive insurance company. These feasibility studies included fee schedules, advertising expenditures and projected client size, assets under management, and monthly flows into accounts. Twenty-four firms submitted applications and feasibility studies, and of those seventeen were approved to operate. Appendix Table 10 lists the firms who applied.[5]

Two of the rejected applicants, IXE and Scotia (Inverlat) entered the market several years later. Both exited not long after entering (see table entries). Since this initial group of successful applicants began operation at the inception of the system, several Afores have exited and/or entered the market. At most there have been twenty-one Afores in the market, and at a minimum there have been eleven. The peak occurred in December of 2006 after a handful of firms entered the market (see Duarte and Hastings (2009)), and the trough occurred in July of 2002, right before the reforms to the switching rules that gave the Afore who a person wanted to switch to the authority to complete the registration and switch the account (as opposed to the right residing with the Afore who was to lose the account).

[4] PowerPoint presentation by CONSAR on "Modernization of the Mexican Pension System," New York, February, 2005.

[5] Source: Historical records from CONSAR.

A.6.1 Assessing the Competitiveness of Fees

At the end of the first year, CONSAR conducted an internal study to demonstrate the success of the system to congressional and executive overseers. [6] The study outlined CONSAR's approach to ensure competition in the system as well as their evaluation of how well the system operated in the first year. The following are some key points from this study.

First, when the system started in 1997, CONSAR did not enforce an explicit upper limit for the Afore fees, but trusted that fees would reduce to competitive levels given the large number of firms in the market.[7] CONSAR's position was that firms would enter, advertize and compete on fees, for customers who would choose a fund manager with low fees to save more money for retirement. Enrollments were much higher than predicted in the viability models submitted by the Afores. This was seen as a major success of the system. It also implied that Afores were more profitable than the original business models suggested. CONSAR expected competitive pressures described above to quickly erode fees to competitive levels.

Second, the report compared fees in Mexico to the main benchmark for pension reform in Latin America – the Chilean system which was established in 1984. At the time the Mexican System started, there were thirteen fund managers in Chile (called AFP's in Chile). At that time, AFP's charged flow fees and annual enrollment fees and a fixed fee per contribution. A list of these firms and their fees appears in Appendix Table 11.

Chileans must contribute 10% of their wage to the social security account, and the fee is taken out of their wage in addition to the mandatory 10% contribution. In other words, all Chileans deposit 10% of their taxable earnings to their social security account. A worker in an AFP charging a 2.85% fee would then have an additional 2.85% of his salary deducted from his paycheck.

To make the comparison between fees in Chile and fees in Mexico, CONSAR constructed an Equivalent Fee on the Wage (as opposed to the later defined Equivalent Fee on the Balance studied in Duarte and Hastings (2009)). This was a single fee taken as a percent of wage that would result in the same balance at the end of a 25 or 40 year holding period that the

[6] August, 1998 report on the system. CONSAR. The report was internally produced and used and does not have an official publication title.
[7] Page 4, 4th paragraph, chapter "*Evolucion de las comisiones de las Afores durante el primer ano de operacion*" in August 1998 report on the system, CONSAR *Agosto 1998*.

Afore's actual combination of balance and flow fees would yield. CONSAR chose a wage, balance and tenure length for this calculation, and then calculated using the Chilean fees and the Mexican Fees. The straight (not market share weighted) average across firms in each country was roughly the same – 1.98% for Chile and 1.92% for Mexico. [8] This calculation was taken as evidence that fees in the first year of the Mexican system were not too high when compared to an established system in Chile. However, Chileans contribute almost twice as much to their accounts from their wage as Mexicans do (10% versus 6.5%). Thus, if this calculation had been reported as a percent of contributions rather than as a percent of wage, the fees in Mexico would have been nearly twice the size as those in Chile (1.92/6.5=0.295 versus 1.98/11.98=0.165). Interestingly, one comparison that does not appear in the initial report is a calculation of the real annual rate of return earned on the Afore accounts at the current fee levels under different assumptions of contribution levels and rates.

It was not until later in the subsequent administration that the size of fees and lack of competition in the system became a prominent focus. This was in part due to the slower-than-expected growth of revenues in the system accounts. This led to several reforms to increase competition starting in 2002.[9] One of the later reforms introduced a voluntary contribution account in which workers could invest in SEIFORES for their supplemental retirement savings. They also introduced voluntary retirement savings accounts for Independent Workers; workers who own their own businesses (independent contractors).

Several Afores offered these voluntary accounts as well as accounts for Independent Workers. Afores were allowed to charge different fees for these accounts than they did for the required pension accounts, even though all of these accounts are held in the same investment. Appendix Table 12 shows these relative fees as of December 2006. Though these accounts are held in the same investment fund, the fees vary greatly between the social security accounts and those for Independent Worker or Voluntary accounts, with the fees for the latter often much smaller than the fees for the traditional social security accounts.

A.6.3 Assessing the Effectiveness of Sales Agents

[8] Page 9, last paragraph, page 10, 1st paragraph and figure 10, chapter "Analisis comparativo de las comisiones que cobraran las Afores," August 1998 report on the system.

[9] For example, reframing fees and requiring worker signatures that they had seen an official table of comparative Afore fees with each switching application was one such effort. The effects of this policy are discussed in Duarte and Hastings (2009).

The August 1998 report also examined enrollment and the role of sales agents. For enrollment, CONSAR noted that the enrollment to the Afores during the first months of the system greatly exceed the expectations set out in the viability studies.[10] This in turn implied that on later evaluation, the Afores would post much larger profits than they had presented as part of the feasibility studies that justified the fees implemented and a rate of return equivalent to a competitive insurance company.

Interestingly, the report also analyzed the role of Sales Agents in the recruiting process. CONSAR analyzed the relationship between market share and fees charged. They found that that the Afores with higher fees also had higher enrollment.[11] CONSAR concluded that Afore fees were not the critical factor in a worker's decision of which Afore to choose, and that the marketing by Sales Agent was likely an important matter in Afore choice. According to the results of regressions of an Afore's total enrollment on a 15 year equivalent fee on an assumed salary and the number of sales agents the Afore employed in the first year, CONSAR found that the number of Sales Agents was a significant determinant of Afore market share, but the equivalent fee on the salary was not. [12] They also then calculated the Afore market share for the population with income equal or lower than 3 minimum wages and the population of affiliates with income higher than 3 minimum wages, and reran the regression. Using Afore market share from lower income, they found that the number of sales agent was the stronger and highly significant, but when using the Afore share from high income workers as the dependent variable, neither the equivalent fee nor the relative level of Sales Agents explained Afore overall market share. While this seems to contradict the overall conclusion of the report that competition was successful in the first year of the system, no further conclusions were drawn based on these results for state of competition and potential evolution of fees going forward.

[10] Page 15, 2nd paragraph, chapter "*Evolucion de las comisiones de las Afores durante el primer ano de operacion,*" August 1998 report.
[11] Page 15, 3rd paragraph, chapter "*Evolucion de las comisiones de las Afores durante el primer ano de operacion,*" August 1998 report.
[12] Pages 1-5 of chapter "Afiliación al Nuevo Sistema de Pensiones: Principales Resultados," August 1998 report. Each regression had 17 observations; one for each Afore.

APPENDIX TABLE IX: APPLICATIONS AND SURVIVAL OF AFORES FROM SYSTEM INCEPTION

Name	Partners	Filed Authorization	Submitted Plan?	Authorized?	Survived to 01/08?	Operating in 02/11?*
Banamex	Banamex-Accival	Y	Y	Y	Y	Y
Bancomer	Bancomer, Aetna, Santa Maria International	Y	Y	Y	Y	Y
Bital	ING America Insurance Holding	Y	Y	Y	N - 11/02	N - 11/02
Garante	Banca Serfin, Citibank, AFP Habitat	Y	Y	Y	N - 02/02	N - 02/02
Genesis Metropolitan	Seguros Genesis; Metropolitan Life Insurance	Y	Y	Y	N - 09/99	N - 09/99
Inbursa	Banco Inbursa; Cia de Servicios Inbursa	Y	Y	Y	Y	Y
Previnter	Inverlat, AIG Co., Bank of Nova Scotia; Bank of Boston	Y	Y	Y	N - 10/98	N - 10/98
Tepeyac	Seguros Tepeyac; MAPFRE International	Y	Y	Y	N - 03/03	N - 03/03
Bancrecer-Dresdner	Bancrecer, Dresdner, Allianz Mexico Insurance Co.	Y	Y	Y	Y**	Y**
Profuturo GNP	Grupo Nacional Provincial, Provida Internacional, Banco Bilbao Vizcaya	Y	Y	Y	Y	Y
Santander	Santander Investment, Banco Santander Mexicano	Y	Y	Y	N - 01/08	N - 01/08
Banorte	Banorte, Belgica, Maatschappij Graafschap Holland N.V.	Y	Y	Y	Y	Y
Capitaliza	GE Capital Assurance, GE Capital de Mexico	Y	Y	Y	N - 12/98	N - 12/98
XXI	Mexican Social Security Institute (IMSS), Aseguradora Hidalgo, IXE grupo financier	Y	Y	Y	Y	Y
Principal***	Banca Confia, Principal International	Y	Y	Y	Y	Y
ING	ING America Insurance Holding;	Y	Y	Y	Y	Y
Atlántico Promex	Banca Promex, Banco del Atlantico; GBM, Valores Finamex	Y	Y	Y	N - 10/98	N - 10/98
Zurich	Zurich Life Insurance Co., private investors, Gabriel Monterrubio	Y	Y	Y	N - 07/02	N - 07/02
NCC – Pepsico	National Chamber of Commerce - Pepsico	Y	Y	N	--	--
IXE	IXE	Y	N	N	Entered - 07/04	N - 06/09
Cablevision	Cablevision	Y	N	N	--	N
Inverlat	Grupo financiero Scotia Inverlat	Y	N	N	Entered - 11/06^{+}	N - 01/10
Pulsar – Asemex	Pulsar – Asemex	Y	N	N	N	N

Source: Historic documents from CONSAR. * Several Afores have entered and exited over the years. As of February 2011 there were 14 Afores in the market. ** Operating as HSBC.*** Applied as Confia-Principal. $^{+}$ Entered as Scotia Afore.

APPENDIX TABLE X:
MANAGEMENT FEES OF CHILEAN FUND MANAGERS (AFPS),
NOVEMBER 1997

AFP	Fee as % of worker's salary	Fixed Fee in pesos	Fixed Fee in equivalent US$ *
APORTA	3.40%	$ 0	$0.00
BANSANDER	2.99%	$ 0	$0.00
CUPRUM	2.99%	$ 0	$0.00
FOMENTA	3.25%	$ 0	$0.00
HABITAT	2.84%	$ 0	$0.00
MAGISTER	2.99%	$ 500	$1.18
PLANVITAL	2.55%	$ 1,495	$3.52
PROTECCION	2.94%	$ 0	$0.00
PROVIDA	2.85%	$ 195	$0.46
QUALITAS	2.89%	$ 0	$0.00
SANTA MARIA	2.93%	$ 100	$0.24
SUMMA	3.15%	$ 230	$0.54
UNION	2.98%	$ 290	$0.68

Source: Statistics Office, Department of Pensions of Chile.* In November 1997, US$1 was equivalent to $424.96 Chilean pesos.

APPENDIX TABLE XI:
FEES CHARGED BY AFORES ON DIFFERENT TYPES OF ACCOUNTS IN THE SAME INVESTMENT FUND (DECEMBER 2006)

	Social Security Accounts		Independent Worker Accounts		Voluntary Accounts	
Afore	Flow Fee[1]	Balance Fee[2]	Flow Fee	Balance Fee[2]	Flow Fee	Balance Fee[2]
Actinver	1.02	0.20	0.0	1.25	0.0	1.25
Afirme Bajío	0.62	0.24	0.0	0.24	0.0	--
Ahorra Ahora	0.90	0.20	0.0	0.20	0.0	--
Argos	1.07	0.33	0.0	0.33	0.0	--
Azteca	0.90	0.40	0.0	--	0.0	--
Banamex	0.75	1.48	0.0	--	0.0	1.00
Bancomer	1.20	0.50	0.0	1.00	0.0	1.00
Banorte Generali	1.25	0.40	0.0	0.40	0.0	--
Coppel	0.92	0.30	0.0	0.30	0.0	--
De la Gente	0.90	0.31	0.0	0.31	0.0	--
HSBC	1.40	0.40	0.0	--	0.0	--
Inbursa	0.50	0.50	0.0	--	0.0	--
ING	1.32	0.30	0.0	--	0.0	--
Invercap	1.03	0.20	0.0	--	0.0	--
IXE	1.10	0.33	0.0	--	0.0	--
Metlife	1.23	0.25	0.0	1.725	0.0	1.725
Principal	1.60	0.35	0.0	--	0.0	--
Profuturo GNP	1.64	0.50	0.0	1.25	0.0	1.25
Santander	1.28	0.50	0.0	--	0.0	--
Scotia	1.22	0.26	0.0	0.26	0.0	--
XXI	1.30	0.20	0.0	--	0.0	--

Source: Consar. [1] SBC: basic salary for calculations is defined as 6.5% of the wage. Thus a Flow Fee of 1.02% charges (1.02/6.5)% of each contribution as an up-front load fee. [2] Annual percentage rate charged on assets under management.