
Part I

System Design and Implications

Chapter 2

The Chilean Pension Reform Turns 25: Lessons from the Social Protection Survey

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Global aging trends pose bankruptcy threats to many conventional PAYGO social security systems around the world. Accordingly, analysts are looking with keen interest at Chile's funded individual-account DC pension plan, a system that was adopted in 1981 and remains in place after twenty-five years. Numerous other Latin-American countries followed Chile in embracing funded individual-account pensions, and the Chilean model has received substantial attention in the USA and other countries as well.¹ Commentators have showered the Chilean pension reform with both praise and criticism, and numerous studies have analyzed dimensions of the reform, including its impact on the macroeconomy, capital markets, and aggregate savings.² Despite the prominence of the Chilean approach to old-age security and continued debate about the pension system's impacts, however, there has been little attention to microeconomic aspects of the new retirement program. In part, this lack of research is attributable to the lack of longitudinal microeconomic data with which to conduct such analyses.

This chapter introduces the Encuesta de Previsión Social (EPS, or Social Protection Survey), a recently developed longitudinal survey of individual respondents that provides invaluable new information for microeconomic analyses of key aspects of the Chilean pension system, and illustrates some of the analyses possible with these data. Initiated in 2002, the EPS fielded a follow-up round in 2004; additional survey waves were scheduled for 2006 and every two years thereafter (funding permitting). In addition, the

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research team has worked to link respondent records to a wide range of historical administrative files on contribution patterns, benefit payments, and other program features. Accordingly, the EPS represents a substantial advance for analysts interested in important micro questions related to the operation of the Chilean retirement system. To illustrate some of the richness of the new information available, this chapter discusses new analyses regarding three key policy questions:

1. Who participates in the Chilean retirement system, and what do lifetime contribution patterns look like?
2. What have people accumulated in the Chilean retirement system, and what benefits may be anticipated?
3. How financially knowledgeable are Chileans about their retirement system?

These three interlinked questions are of interest as they pertain to the central purpose of a retirement system: namely, to provide adequate resources for a secure retirement. The subject of pension coverage and who contributes to their pensions over their work lives is important in the Latin-American context as well as in many other nations where pension system nonparticipation is currently a topic of active debate (see, for instance, Gill, Packard, and Yermo 2005). Whether and how individual workers and their families participate in the system can only be studied with microdata of the sort we are developing. Anticipated retirement benefits from the system are also of key policy interest, as these will vary with lifetime contribution patterns as well as socioeconomic status, retirement ages, and other factors. In the Chilean context, it is also worth recognizing that the funded individual-account program is backstopped by safety net components to protect those who accumulate little in their personal accounts. Improved projections of future financing burdens will require detailed data on patterns of contributions and assets accumulated over the lifetime. Finally, learning more about workers' financial literacy regarding their pension system is of interest in the Chilean case, as lack of knowledge may possibly explain participation and other choices related to the system, as well as whether the system favors certain types of people over others—for example, those with more rather than less schooling.

To preview, the results show:

- Over their work lives, men self-report contributing to the pension system about half the time since aged 18 years, with lower levels for women. Thus, men in their 40s report contributing for a total of about 14 years since aged 18 years; women, about 10 years.

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- Self-reports of payments into the new pension system indicate higher contribution levels than do administrative records for the same people over the same period. For instance, administrative records for men currently in their 40s indicate about 13 years of contribution since aged 18 years, and for women, about 6 years.
- Spells of noncontribution appear mainly to be periods when people held no jobs, were unemployed, or were self-employed (self-employed persons are not required to contribute to the system). In other words, contribution patterns during periods of work as employees (particularly in wage employment) are very high.
- Account balances reported by respondents who claim to know their accumulations in the AFPs (Administradoras de Fondos de Pensiones, or pension fund managers) are remarkably similar to those derived from administrative records, averaging around \$3 million Chilean pesos (~US\$5,600). However, only 40 percent of the respondents are able to provide an estimated balance—and administrative data for the entire sample suggests that those who offer estimates have larger accounts than respondents who cannot estimate their AFP assets.
- Retirement payments for those currently reaching retirement age also depend on recognition bonds (RBs) from the old PAYGO system. Those RBs are worth as much as the AFP system assets for respondents entitled to them. Accordingly, any analysis of retirement assets and eventual benefits must recognize both sources of retirement support.
- Knowledge of the new Chilean pension system is far from perfect. For instance, most workers cannot accurately report contribution requirements under the new system, how much they pay in commissions, what the rules are for minimum pensions, and how they have their funds invested. Lack of knowledge is concentrated among those employees with poorer backgrounds and less education and among women.
- Among retirees, knowledge is more satisfactory. Most people who are retired according to administrative records also self-report they are retired (84%). Some two-thirds of the retirees know what kind of pension they are receiving, and about 64 percent know the benefit amount (give or take 20%), though they tend to report smaller amounts than are indicated by the administrative data. In general, people who know their pension amounts also are those receiving larger benefits than the median.

Some of these findings appear to be matters of concern to the newly elected Chilean president, who confirms that pension reform is high on her policy agenda.

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The Evolution of Chile's Retirement System³

Chile was among the pioneers of social security in Latin America, establishing its first national social insurance fund in 1924. The subsequent evolution of Chile's social security system had three stages. The first, between 1924 and the 1970s, was based on the Bismarckian model of occupationally segmented social insurance schemes. The second, from the 1970s to 1980, reflected the Beveridge plan's proposal for universal social security coverage. The hallmark of the third, which began in 1980, was the development of a funded system with privately managed individual accounts, supplemented with a social safety net, described below.

The Chilean Retirement System before 1980

The Chilean old-age system began in the 1920s. By the mid-1950s, three main pension funds (or *cajas*) provided benefits for most salaried workers, and two separate funds covered the police and armed forces. As time went on, other funds were created and the menu of regimes within the three main pension programs expanded. At the end of the 1970s, the retirement system included as many as 150 individual regimes and substantial institutional fragmentation, with 35 different funds (see Castañeda 1990). Consequently, coverage was stratified, was only moderately progressive, and threatened the nation with a rising fiscal burden. Several different governments tried unsuccessfully to reform the structure over the years, but their attempts were repeatedly blocked by powerful interest groups (Arellano 1985; Mesa-Lago 1994). Benefit eligibility varied across sectors and depended on a minimum number of work years in that sector. Retirement payouts were set according to DC formulas that granted higher payouts for more years of work and higher pay in that sector. Many workers were not covered by any retirement plan, and those who were faced very uncertain benefits due to the increasing insolvencies of the programs.

Issues Regarding Coverage

The core objective of an old-age system is to ensure an adequate income for retirees, with most modern systems also providing social insurance for disabled persons, surviving spouses, and orphans. Effectiveness in fulfilling these objectives, therefore, relies heavily on the system's ability to collect contributions or taxes when individuals are in the economically active population. Accordingly, assessing a pension system's success is at least partly measurable by inquiring what percentage of active workers pays into the program. Table 2-1 summarizes the fraction of the employed population

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TABLE 2-1 Pension System Contribution Patterns: 1975–80

Year	Contributors/Employment			Contributors/Labor Force		
	AFP	INP	Total	AFP	INP	Total
1975	n/a	71.2%	71.2%	n/a	61.9%	61.9%
1980	n/a	53.3%	53.3%	n/a	47.8%	47.8%
1985	44.0%	12.8%	56.9%	38.8%	11.3%	50.1%
1990	50.6%	8.1%	58.7%	46.8%	7.5%	54.4%
1995	57.2%	5.5%	62.7%	53.5%	5.1%	58.6%
2000	59.4%	4.2%	63.6%	54.5%	3.9%	58.4%

Source: Derived from Arenas de Mesa, Behrman, and Bravo (2004).

Note: n/a = not applicable.

and the fraction of the labor force that has paid into the retirement system over time. The table shows that the highest ratio of contributors was seen in the mid-1970s, with a downward trend thereafter. When the new system was introduced in 1980, the fraction of workers and the overall labor force that contributed to the national pension fund (the Instituto de Normalización Provisional, or INP) fell precipitously, while the contribution rate to the AFP system rose steadily. Other authors report similar patterns over the period, although levels of coverage differ from one study to the next (Arellano 1985; Cheyre 1988).

The downward trend in effective coverage that began in the early 1970s can be accounted for in part by rising unemployment, since jobless workers have not been expected to pay into the system. But increasing unemployment was not the only reason, since coverage within occupations (among workers with jobs) also declined in the mid-1970s, falling from 86 to 71 percent over the period 1975–80 (Cheyre 1988) or from 71 to 53 percent (Arellano 1985). Some experts contend that much of the coverage declined during the 1970s was attributable to increased evasion (Cheyre 1988). Others emphasize the complex interaction of higher unemployment, greater incentives for evasion, and more precarious labor relations (Marcel and Arenas de Mesa 1992).

Financing the Old PAYGO System

Another measure of a retirement system's effectiveness has to do with its ability to provide benefits to those eligible to receive benefits. In Chile, the number of retirees and others eligible to receive benefits climbed from approximately 500,000 people in the late 1960s to more than 1 million people by the end of the 1970s, for an average annual growth rate during that decade of 5.7 percent (Arenas de Mesa 2000).

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Before 1980, the system was for all intents and purposes a PAYGO system; returns on the few invested assets amounted to only 2.5 percent of the system's total annual revenues. As a result, the system's financial equilibrium depended on economic growth, since in a PAYGO program, economic growth, along with trends in the ratio of contributing members to noncontributing members, determines wage levels and hence revenues from contributions.

Assuming constant conditions in terms of replacement ratios and contribution rates, the contribution ratio is in turn determined by demographic factors such as the age composition of the population, economic factors such as unemployment, the relative size of the informal sector in the economy, evasion rates, regulatory and policy-related factors such as the established retirement age, and pension eligibility requirements for early retirement. In Chile, the ratio of contributing to noncontributing members had trended downward between 1965 and 1980, falling from 3.6 to 2 contributing members for every pensioner. At the time of the reform, government revenues averaging 2 percent of GDP per annum had already been required to finance the system (see Table 2-2). Further, it seemed clear that maintaining pension promises would have required further infusion of large amounts of government revenues to the old-age system.

The 1980 Chilean Pension Reform

Thus, Chile's pension system, like those of many other Latin-American countries that undertook reforms later, was institutionally fragmented, included a vast number of different regimes, and faced problems regarding finances, coverage, equity, and administrative efficiency (Arenas de Mesa 2000). Both the Frei and Allende administrations attempted to standardize

TABLE 2-2 Pre-1980 Old-Age System Revenues and Expenditures: 1974–80

Year	Millions of 2003 pesos			% of GDP		
	Revenues	Expenditures	Deficit	Revenues	Expenditures	Deficit
1974	344,523	698,866	-354,342	3	6.2	-3.1
1975	310,985	422,261	-111,276	3.4	4.6	-1.2
1976	360,509	662,877	-302,369	3.4	6.2	-2.8
1977	454,651	831,933	-377,282	3.6	6.7	-3
1978	556,642	1,027,681	-471,039	3.7	6.8	-3.1
1979	937,063	1,241,874	-304,811	5.2	6.9	-1.7
1980	1,017,362	1,336,172	-31,881	5.5	7.2	-1.7

Sources: Marcel and Arenas de Mesa (1992) and Central Bank of Chile (BCCH).

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the pension regimes and do away with privileges enjoyed by limited groups, but both failed to achieve the necessary consensus.

Several years after the military government of General Pinochet took power, it launched a national retirement system reform. The first phase sought to stabilize the PAYGO system by raising retirement ages, increasing contribution rates, and eliminating some special schemes. Subsequently, the government moved in 1980 to reform the system dramatically by closing the old system to new workers and replacing it with a new system that placed at center stage a system of funded DC individual accounts. In addition, the government standardized eligibility and benefit requirements.

While many non-Chileans focus primarily on the individual-account element of the pension system, it must be recognized that the resulting structure is a ‘three-pillar public/private’ system, in the terminology of the World Bank (1994).

The *first pillar* has three key components:

1. A noncontributory public system provides welfare-based pensions (*pensiones asistenciales*, or PASIS) for the indigent. The system is means-tested and operated centrally for both the determination and payment of PASIS benefits.
2. A state-guaranteed minimum pension guarantee (MPG) for AFP participants who have twenty years of contributions. The purpose of the MPG—a key element of Chile’s social protection policy—is to ensure that all eligible participants will receive a basic level of minimum old-age income. In practice, the federal government makes transfer payments to the AFP accounts of retirees who have insufficient balances to pay the minimum pension.
3. The public DC system, the old INP, that administers the old PAYGO DC program was closed to new entrants by the 1980 reform.⁴

The *second pillar* of the Chilean pension system consists of the mandatory contributory program known as the AFP system. This is a national savings program aimed at all wage and salary workers, intended to provide participants with old-age benefits. (It also provides life insurance and disability benefits as part of the mandatory program.) When the new program was announced, existing workers were required to decide whether to remain in the old INP system or to move to the new system. Those who moved to the new system received credit for INP contributions in the form of the transferable RB.⁵ The new AFP system is mandatory for all new wage and salary workers joining the labor force as of 1981, but affiliation remains optional for self-employed workers.

Wage workers in the AFP system establish individual pension accounts by affiliating with one of the privately managed pension funds. By law, workers

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must contribute 10 percent of their monthly earnings, plus an additional contribution (currently 2–3% of monthly wages) to cover administrative costs as well as disability and survivor insurance.⁶ Workers may only participate in one AFP at any given time, but they may periodically switch between AFPs with proper notice.⁷ Initially, all AFP monies were invested in government bonds, though more recently pension fund managers have been permitted to offer a broader, albeit regulated, array of investment choices. They also offer a lifecycle investment strategy that automatically moves assets into more conservative investments as workers age. At retirement, retirees may use their accumulated funds, including the RBs, to purchase a lifetime income stream.⁸

Affiliates who have contributed for at least twenty years but who have accumulated funds insufficient to reach the MPG level are entitled to receive a government subsidy financed from general tax revenues.⁹ Workers cannot receive their pensions until the legal retirement age (currently age 60 years for women and 65 years for men), but early retirement is allowed under some conditions.¹⁰ Naturally, as with any DC plan, retiree benefits depend directly on AFP balances at retirement, and hence benefits are a function of workers' lifetime earnings, contribution histories, and AFP investment choices. For this reason, retirees' benefits depend more closely on individuals' risk preferences and behavior, whereas in a DC, or PAYGO, plan, solvency risks are more prominent.

The *third pillar* of the Chilean system, like the second, operates on the basis of individually funded DC accounts. However, in keeping with the World Bank model that gained in popularity during the 1990s, it is a voluntary program. Affiliates who wish to pay more than the mandated pension contribution may do so, and such contributions receive some tax benefits.

The new AFP system and the old PAYGO system differ in key ways. Most importantly, workers' AFP accumulations represent funded, individually owned accounts, over which affiliates have some investment and bequest decision-making power. By contrast, the PAYGO structure of the old Chilean system faced bankruptcy. In moving to the new plan, the hope was that workers would become more aware of the value of participating in the system, the size of their own accumulations, the opportunity to make investment choices, and the options regarding retirement payouts. Further, under the AFPs, workers would have a chance to save more than the 10 percent required contribution, which might be attractive to those who truly value access to funded individual investment-based accounts. Also, AFP savings and pension payouts are inflation-adjusted, addressing a well-known deficiency of the old PAYGO plan.¹¹ Finally, the fact that AFP affiliates are guaranteed a minimum wage-indexed retirement benefit—worth twice the welfare benefit—if they pay into the new system

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for twenty years was anticipated to draw more workers into formal sector jobs.

Transition Issues

More than twenty-five years of experience with the new reform finds the Chilean transition process in full swing. Both the old and the new systems continue, with the old one gradually winding down over time and the new one growing at a steady pace. Contributors to the old system will cease being active workers in about 2025, and retirement pensions will stop being paid in approximately 2050.¹²

It is interesting that the reform was intended to confine the government's role to that of pension system regulator, inspector, supervisor, and guarantor of the AFP system. In particular, via the Superintendencia de Administradoras de Fondos de Pensiones (SAFP, or Superintendency of Pension Fund Managers), the government is charged with regulating, inspecting, and supervising the management of the AFP system (SAFP 2002). In addition, the government plays a significant role in several key areas:

- Administration and payment of benefits under the old INP system;
- Administration, calculation, and payment of RBs for those who transferred to the AFPs;
- Administration and payment of pension benefits under the public plans for the armed forces and the police;
- Administration and payment of the MPG under the AFP system; and
- Administration of the PASIS system for indigents and those lacking pension coverage.

The first two of these governmental duties are time-limited, but the others are ongoing.

Furthermore, the government serves as the guarantor of last resort in the event of the bankruptcy or default of any AFP or insurance provider, as well as by ensuring that the yields for plan members remain above an established floor rate. Each of these responsibilities imposes an actual and potential financial burden on government coffers, the amount of which is an area of continuing research.

Economic Impacts of the Funded Individual Accounts

The accumulating pension funds have played a growing role in the Chilean economy since 1980. By 2003, the assets had grown to around 60 percent of GDP (see Table 2-3). The pension funds have acted as an engine of growth for various sectors of the economy and for the capital and life-insurance markets, among others. The AFPs, now the largest institutional investors

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TABLE 2-3 Cumulative Value and Rates of Return on Chilean Pension Fund Assets: 1981–2003

<i>Year</i>	<i>Pension Fund Assets under Management</i>		<i>Returns on Fund Assets</i>
	<i>Value^a</i>	<i>% of GDP</i>	<i>Average Yearly Real Return (%)</i>
1981	11,695	0.9	12.8
1982	44,495	3.7	28.5
1983	99,474	6.5	21.3
1984	159,576	8.4	3.6
1985	281,807	10.3	13.4
1986	433,377	12.7	12.3
1987	644,728	14.1	5.4
1988	885,875	14.7	6.5
1989	1,329,268	17.5	6.9
1990	2,244,481	23.3	15.6
1991	3,769,243	29.7	29.7
1992	4,736,462	29.4	3
1993	6,830,788	35.4	16.2
1994	8,983,563	38.8	18.2
1995	10,230,990	36.1	–2.5
1996	11,555,632	37	3.5
1997	13,405,826	38.6	4.7
1998	14,552,547	39.8	–1.1
1999	18,093,003	48.7	16.3
2000	20,343,371	50.1	4.4
2001	22,955,974	52.8	6.7
2002	25,227,058	54.4	3
2003	29,176,611	58.6	10.5
1981–91	—	—	14.2
1991–2003	—	—	8.7
1981–2003	—	—	10.4

Source: Arenas de Mesa (2005).

^aMillions of current pesos.

in the financial market, finance five out of nine new mortgages (SAFP 2002).

Over time, the asset mix of these funds has changed considerably, becoming more diversified (see Table 2-4). In 1981, the bulk of these investments were in financial papers (71.3%) but in 1989, the share of such instruments began to shrink, falling to 26 percent by 2003. Meanwhile, the share of corporate bonds—that is, bonds issued by nonfinancial institutions—and equities expanded, rising to 7.7 and 14.5 percent (13.5% in business

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TABLE 2-4 Distribution of Investment Portfolio: 1981–2003

Year	Government	Financial Institutions ^a	Nonfinancial Institutions ^b	Equities ^c	Mutual Funds and Others ^d	Foreign Assets ^e	Other ^f
1981	28.1	71.3	0.6	0	0	0	0
1985	42.4	56.0	1.1	0	0	0	0.5
1990	44.1	33.4	11.1	11.3	0	0	0.1
1995	39.4	22.4	5.2	30.1	2.6	0.2	0.1
2000	35.7	35.1	4.0	11.6	2.5	10.8	0.2
2003	24.7	26.3	7.7	14.5	2.9	23.8	0.1

Source: Derived from Arenas de Mesa (2005).

Note: Totals should sum to 100% except for rounding error.

^aFinancial sector less the equities of financial institutions.

^bBusiness firms less equities and quotas of investment funds.

^cStocks of financial institutions plus those of the business sector.

^dInvestment funds of the business firms plus others from the external sector.

^eForeign issuers less others from the external sector.

^fDisposable assets.

enterprises and 1% in financial institutions), respectively, by 2003—about 13 percent of GDP. Investment in foreign assets began in 1993, three years after the law creating this option was passed. In that year, such investments amounted to 0.6 percent of the funds' total value; by 2003, their share had grown to 23.8 percent. These changes in AFP portfolios have been made possible by the growth of the pension funds, the development of the capital market, and the relaxing of regulations that place limits on investments (SAFP 2002).

The Social Protection Survey and Linked Administrative Data

In 2002, the Micro-data Center of the Department of Economics of the Universidad de Chile under the directorship of David Bravo conducted a new household survey, called the Encuesta de Previsión Social (EPS), or the Social Protection Survey. This survey has been an invaluable research tool, providing researchers much useful new individual-level information—information that previously was unavailable—for addressing numerous research questions, including the main issues of this chapter.¹³ The interview sample was drawn from a sampling frame of approximately 8.1 million current and former affiliates of the Chilean old-age systems compiled from official databases obtained from the Chilean Ministry of Labor and Social Security. The frame included about three-quarters of the population aged 15+ in 2001. The survey, fielded between April and December 2002,

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collected data from individuals who were working, unemployed, out of the labor force, receiving pensions, or deceased (in which case information was collected from surviving relatives).

The 2002 EPS survey included sociodemographic information and current labor market data for each member of the household, detailed information about receipt of pensions and types of pension plan participation, and retrospective labor market history going back to 1980. Ultimately, the survey contains data on 17,246 individuals (937 of them were reports by surviving relatives) affiliated with the old or the new retirement system for at least 1 month at any time during 1981–2001.¹⁴

In 2004 surveyors administered another round of the survey, which included a second wave for previously surveyed respondents as well as new surveys for a subsample of individuals not affiliated with the social security system (individuals never employed in the formal sector) and a subsample of new entrants into the AFP system between 2002 and 2004. The survey, in addition, introduced a host of new health and wealth questions.¹⁵ Consequently, the 2004 survey is representative of the entire Chilean population.¹⁶ Furthermore, the research project received permission to merge responses with administrative records on pension contributions and earnings in the PAYGO and AFP systems since 1980; data on the amounts of RBs; and monthly data on account changes in the individual investment accounts, switches between AFPs, AFP commissions charged, and investment returns earned on all AFP accounts. The survey data has also been merged with monthly social security records available since 1981.¹⁷ In what follows, we provide details about the specific variables central for each analysis.

Informing the Policy Debate Using the Social Protection Survey

As noted, the 2002 and 2004 surveys, linked to administrative records, provide the essential database for answering the critical micro questions about the current Chilean pension system posed in the introduction of this chapter. Next we turn to the evidence.

Contribution Patterns under the Chilean Retirement System

This section characterizes retirement system contributions made by EPS respondents. The information used to track contributions is derived from two sources. First, EPS interviewees were asked about their employment and old-age system work histories and contribution patterns from 1980 onward. Specifically, Module II of the 2002 EPS survey asks, for each job

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held since aged 15 years, whether the respondent contributed to some retirement system and, if so, which system. Second, it asks respondents to report earnings, hours of work, labor force status, occupation, and industry for each job. We use this survey information to derive the respondents' self-reported months of contribution over time. This information may be further classified according to each respondent's labor market status at the time, which we identify as working, unemployed, or not in the labor force. To derive the self-reported months of contributions to various retirement systems, we first turn to the labor history section of the 2002 EPS. Here we count only months of contributions reported for respondents between the ages of 18 years and 60 years, inasmuch as there is little formal work prior to age 18 years, and some individuals, particularly women, retire at age 60 years.

The results of this tabulation may be seen in Table 2-5. Panel A contains both self-reports and administrative records on months of contributions to the AFP system, for those for whom we have both sets of records.¹⁸ Panel B indicates total months of contributions to all retirement systems, including the old INP as well as the AFP programs. In the self-reports on AFP contributions, men report more months of AFP contributions, on average, than do women. This finding is not surprising, given that many Chilean women leave the paid labor force for childrearing. Also clear is the rising pattern of contributions by age, such that workers in their late 20s report 64 months of contributions to the AFP system (5.3 years on average) since 1981, while workers in their 50s report more than double this level (14.1 years). It is worth recalling that workers older than 39 years in 2002 would have been exposed to the old INP system prior to the 1980 reform and hence are likely to have had periods of contributions under the old system as well (more on this below).¹⁹ Somewhat surprising is the result that months of contributions do not vary much by education, at least for the self-reported tallies.

The second column in Panel A of Table 2-5 indicates mean months of contributions to the AFP system derived from administrative records over the same calendar period, while the third column displays the ratio of self-reported months to administrative data.²⁰ Overall, self-reported contribution months exceed the administrative data counts by 20 percent, no doubt in part due to recall error.²¹ Those in the 30–50 age range seem to be most optimistic regarding their self-reported months of contribution, with lesser differences for younger and older individuals. The third column shows that men are less likely to over-report than women, compared to administrative records; younger workers less than middle-aged workers; and educated workers less than the lesser-educated. Figure 2-1 plots the months of contribution patterns and differences by more detailed age groups, for the AFP system alone and for (self-reports of) contributions to all

TABLE 2-5 Contribution Patterns to the Chilean Retirement System by Sex, Age, and Education: Number of Months Contributed by EPS 2002 Respondents

	<i>Mean Self-Report</i>	<i>Mean Admin</i>	<i>Ratio Self/Admin</i>	<i>N</i>
<i>A. Respondents with Linked Records: Months of AFP Contributions Only</i>				
Total	113	90	126%	12,108
<i>By sex</i>				
Men	129	103	125%	6,722
Women	94	73	127%	5,386
<i>By age</i>				
18–20	12	13	97%	208
21–5	32	27	117%	1,252
26–30	64	51	123%	2,013
31–8	107	84	128%	3,190
39–45	150	114	131%	2,571
45–50	161	129	125%	1,257
51–5	170	141	121%	964
56–60	169	141	120%	653
<i>By education</i>				
<Elem	114	82	139%	2,064
<HS	112	83	135%	3,267
HS	110	88	126%	3,725
>HS	117	103	113%	3,052
	<i>Mean Self-Report*</i>	<i>N</i>	<i>Mean Self-Report**</i>	<i>N</i>
<i>B. All Respondents: Months of Contributions to All Retirement Systems</i>				
Total	121	12,128	120	13,397
<i>By sex</i>				
Men	137	6,728	136	7,330
Women	101	5,400	100	6,067
<i>By age</i>				
18–20	12	213	11	245
21–5	33	1,255	33	1,319
26–30	66	2,016	65	2,057
31–8	112	3,193	111	3,271
39–45	161	2,575	156	2,781
45–50	176	1,259	169	1,459
51–5	185	964	174	1,251
56–60	184	653	166	1,014
<i>By education</i>				
<Elem	126	2,065	122	2,629
<HS	120	3,276	118	3,625
HS	117	3,733	117	3,938
>HS	122	3,054	122	3,205

Source: Authors' computations from the EPS 2002 and administrative records linked with EPS respondents.

Notes: EPS respondents in 2002 aged 18–60; all results weighted. * = Respondents with a linked administrative record; ** = All EPS 02 respondents. Number of months of contributions counted from the date of the first self-reported contribution to AFP system.

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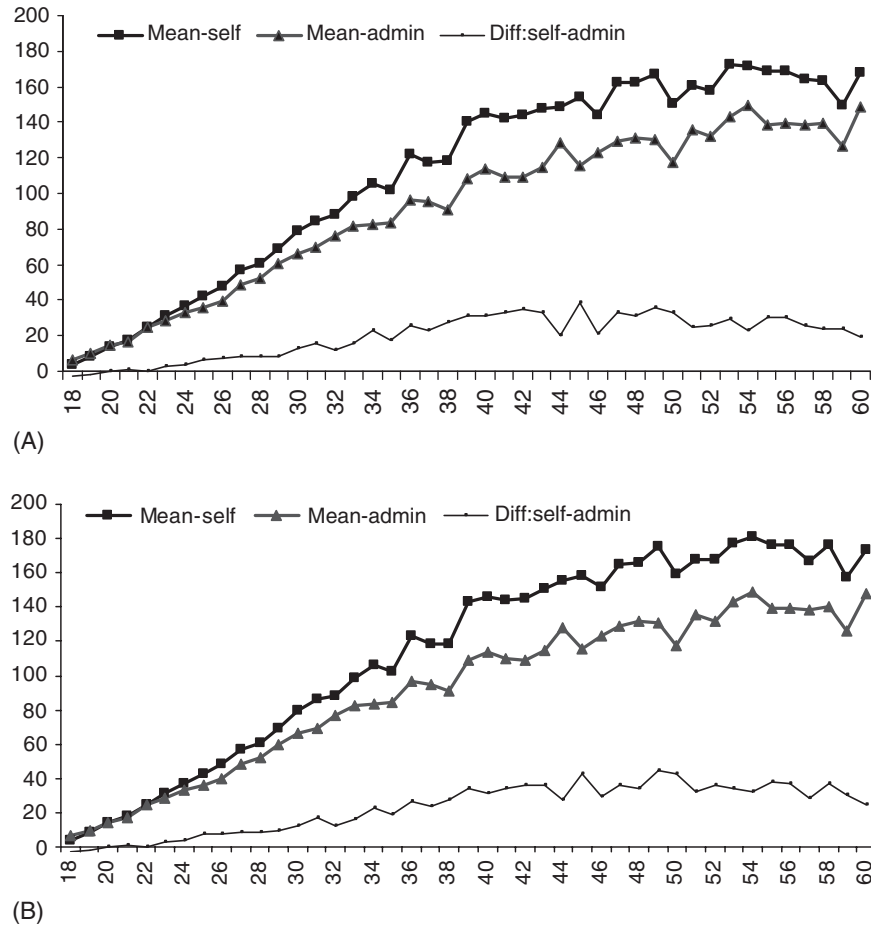


Figure 2-1. Contribution patterns to the Chilean AFP system by age: self-reported vs administrative records. (A) Months of contributions to the AFP system, and (B) months of contribution to all retirement systems. (Source: Authors' computations; EPS 2002 respondents aged 18–60 with linked administrative record; all results weighted; $N = 11,305$. Note: Number of months of contributions counted from the date of the first contribution to any AFP.)

retirement systems. Overall, the patterns appear similar to those depicted in Table 2-5.

For purposes of comparison, Panel B of Table 2-5 provides self-reported months of contribution data for all retirement systems, including the old INP, various public sector *cajas*, and the new AFP system. The first two

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TABLE 2-6 Pattern of Contribution Months to All Retirement Systems by Sex, Age, and Education: Labor Market Status at Time of Contribution

	<i>Mos. While Working</i>	<i>Mos. While Unemployed</i>	<i>Mos. While NILF</i>	<i>N</i>	<i>% of Mos. Contributing in that LF Status</i>			
					<i>Working</i>	<i>Unempl.</i>	<i>NILF</i>	<i>Wage wrkr</i>
<i>By sex</i>								
Men	135	0.5	0.7	7,330	78.72	5.44	3.67	89.30
Women	97	0.6	2.2	6,067	81.86	4.00	2.92	90.56
<i>By age</i>								
18–20	10	0.1	0.3	245	80.92	1.95	3.86	81.69
21–5	32	0.2	0.4	1,319	82.26	2.79	1.91	86.31
26–30	65	0.2	0.6	2,057	80.89	2.48	1.47	86.87
31–8	110	0.4	1.2	3,271	77.89	3.28	2.40	87.63
39–45	154	0.6	1.4	2,781	79.32	4.68	3.24	89.93
45–50	166	1.0	2.1	1,459	79.87	11.04	5.98	91.65
51–5	171	1.2	1.6	1,251	82.03	7.56	4.55	93.30
56–60	161	0.8	4.1	1,014	82.73	4.70	7.39	93.54
<i>By education</i>								
<Elem	119	1.0	1.8	2,629	71.34	5.49	2.41	85.29
<HS	116	0.6	1.4	3,625	76.07	4.59	3.59	88.22
HS	116	0.4	1.2	3,938	84.09	4.30	3.31	91.29
>HS	121	0.3	1.4	3,205	85.96	4.27	2.92	92.26

Source: Authors' computations from the EPS 2002 and administrative linked data.

Notes: EPS respondents in 2002 aged 18–60; all results weighted. NILF = not in labor force. Number of months of contributions counted from the date of the first self-reported contribution to the AFP system.

columns focus on respondents with linked records only, while the third column focuses on all EPS 2002 respondents, whether they had linked records. Not surprisingly, overall patterns are similar to those previously described by age, sex, and education. One difference is that self-reported months of contributions to all systems are higher than those to the AFP system alone, mainly due to the fact that older (age 40+) workers report more contribution months. This is probably accurate, inasmuch as the older workers could have been contributors to the old INP system and we lack accurate contribution history data from that system.

Table 2-6 breaks down the pattern of workers' months of contributions in the retirement system by labor market categories—specifically, working, unemployed, and not in the labor force. The data reveal that the majority of contribution months coincides precisely with those months when respondents were working, particularly in the wage labor force. Contribution patterns (particularly wage employment) are very high during periods of work. Put differently, lapses in contributions appear associated mainly with

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periods of nonemployment rather than outright nonpayment of retirement contributions during employed periods. This finding suggests that analysts concerned with low levels of retirement accumulations would do well to focus on non- or unemployment. Furthermore, contribution months are very high for periods of wage work, in the 80–90 percentile range, which implies that the problems of low contribution months are not concentrated among the self-employed. Although self-employed persons are not required to contribute to the system, this does not seem to be a major source of nonpayment.

Retirement Accumulations in the Chilean Retirement System

Previous research has focused on whether workers are contributing enough to the Chilean retirement system to obtain adequate benefit levels in retirement. As a result, analysts have based projected replacement ratios for AFP participants on the assumption that workers would contribute 70–90 percent of their work lives (cf. Arenas de Mesa and Gana 2003). The replacement rate is defined here as the percentage of the worker's last pay divided by his or her monthly pension (assuming the partnered retiree takes a joint-and-survivor benefit). However, in a more recent study, Arenas de Mesa, Llanés, and Bravo (2005) recomputed projected replacement ratios using the self-reports of contribution patterns taken from the 2002 EPS. These new findings are important, as they rely on actual patterns of contributions reported over workers' lifetimes rather than on assumed contribution patterns on average. In addition, the findings provide evidence at the individual worker level, allowing the projection of patterns by earnings, sex, and age. The above-mentioned studies project likely AFP balances at retirement as well as replacement rates implied by these projections for a male age-65 retiree with female partner 5 years younger, and a lifetime contribution pattern of 80 percent of the work life (also known as 'density of contributions'), or 60 percent; and a female age-60 retiree with a density of contributions of 80 percent, or 43 percent.²² A man at age 65 years who has contributed 80 percent of his work life would be expected to accumulate an AFP balance of \$37 million, which Arenas de Mesa and Gana (2003) expect would finance a joint-and-survivor annuity amounting to about 60 percent of pre-retirement pay. A single woman who retires earlier after the same contribution pattern would accumulate an AFP balance of \$29 million, which implies a replacement ratio of 43 percent. However, having lower lifetime contributions reduces projections substantially. For instance, if men contribute only 60 percent of the time and women, 43 percent, estimated AFP balances would be lower by 25–46 percent, and the pension annuity would drop from 60 to 44 percent for men, and from 43 to 23 percent for women (see Figures 2-2 and 2-3).

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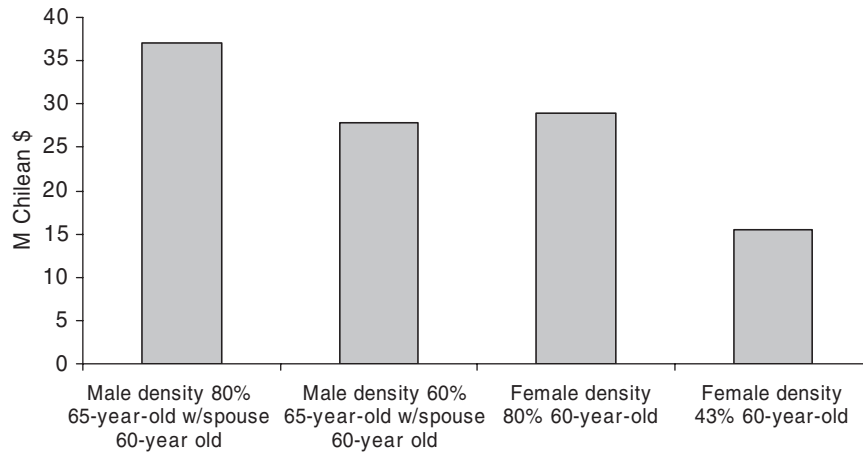


Figure 2-2. Projected accumulations in AFP accounts at retirement age given alternative density of contribution assumptions (*Source: Arenas de Mesa, Behrman, and Bravo 2004*).

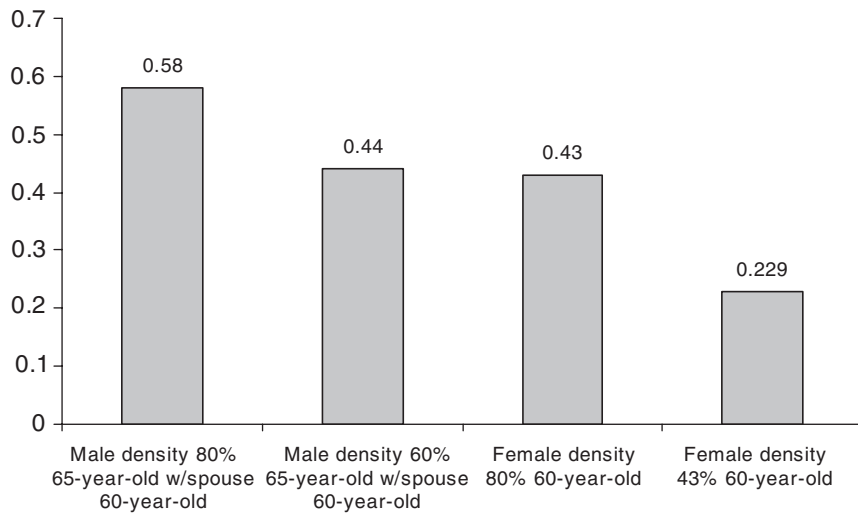


Figure 2-3. Projected replacement rates under alternative density of contribution assumptions (*Source: Arenas de Mesa, Behrman, and Bravo 2004*).

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This chapter does not include new projections of accumulations and replacement rates using the administrative data, though that is the goal of future work. However, the information presented in this chapter informs that analysis by reporting on retirement system assets accumulated by participants to date. Panel A of Table 2-7, for instance, shows that AFP account balances reported by respondents who state that they know their accumulations are accurately measured compared to AFP balances from administrative records, with the median at around \$3 million Chilean pesos (~US\$5,600). On the other hand, only 40 percent of the EPS respondents could provide an estimated AFP balance, which might imply that these individuals are likely to have more assets than those unable to provide an estimate. Indeed, over the entire EPS sample, the median respondent offering a balance estimate appears to have four times the accumulation compared to the median respondent unable to estimate his or her AFP assets, according to administrative records. Across the entire sample, the median AFP accumulation derived from administrative records totals about \$1.5 million Chilean pesos (or about US\$2,800).

Retirement payments for those currently reaching retirement age also depend on RBs from the old PAYGO system. Panel B of Table 2-7 shows that these RBs are worth as much as the AFP system assets for respondents entitled to them, with the median account worth about \$4 million Chilean pesos (about US\$8,000). Clearly, analyses of projected retirement benefits under the Chilean retirement system must recognize both sources of retirement support. Panel C indicates that AFP accruals for those without an RB are lower, in part because individuals in this group are much younger than those who accumulated substantial benefits under the system that was closed to new entrants in 1980.

Financial Literacy Regarding the Chilean Pension System

What workers know about their old-age benefit system can have a major impact on how effectively they prepare for retirement and how they determine their retirement plans. For example, if people believe their benefits rise with deferred retirement, they may be more likely to respond to incentives to continue work. On the other hand, if they systematically misperceive the costs and benefits of the system, then their misinformation (e.g. about the number of years required for eligibility) can shape the system's popularity as well as the perceived effectiveness of specific reforms. Yet very little is known about how people develop the necessary level of financial literacy to understand their pension systems, particularly when workers have personal DC pension accounts. Studies based on the United States' experience suggest that many workers arrive at retirement with little knowledge of

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TABLE 2-7 Retirement Balances Accumulated under the AFP and RBs: Self-Report vs Administrative Records

Percentile	For Those with a Self-Reported AFP Balance (N = 4,677)			Does Not Know (N = 7,686)		Total (N = 12,363) Admin. Amt
	Self-Report Amt	Admin. Amt	Diff.	Percentage	Admin. Amt	
<i>A. Individual Account Balances, AFP System: Self-Report vs Administrative Records (2004 Chilean Pesos)</i>						
p25	820,000	906,000	-86,000	-10	125,443	324,300
p50	3,000,000	2,929,800	70,200	2	738,300	1,531,100
p75	8,000,000	7,087,800	912,200	11	2,549,900	4,574,200
<i>Percentile AFP Balance Bond Total</i>						
<i>B. Individual Account Balances Plus RBs: Administrative Records Only (2004 Chilean Pesos; N = 2,458)</i>						
p25	86,800	748,857	5,800,972			
p50	4,263,400	4,491,373	12,700,000			
p75	10,700,000	13,000,000	23,800,000			
<i>Percentile AFP balance</i>						
<i>C. Individual Account Balances for Those with No RBs: Administrative Records Only (2004 Chilean Pesos; N = 9,905)</i>						
p25	341,700					
p50	1,293,000					
p75	3,561,700					

Source: Authors' computations from the EPS 2002 and administrative linked data.

Notes: EPS respondents in 2002 aged 18-60; all results weighted.

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their retirement system. (See, for instance, Mitchell 1988; Gustman and Steinmeier 1999; Lusardi and Mitchell 2006.) As a result, they often fail to plan well for their retirement and may be ineffective advocates for retirement system changes. Little is known about whether similar problems arise for workers in a national DC system. As they bear greater responsibility for their own retirement and pension options through personal accounts, workers may be better informed about retirement risks and rewards.

This section investigates to what extent Chilean workers understand and make sense of the pension institutions covering the workforce. We posit that those better informed about their pensions are more likely to make sensible provisions for old age, possibly by contributing more, paying more attention to plan investments, and making appropriate payout options. Accordingly, we investigate the factors associated with being informed about the pension system's characteristics, focusing on, for example, the association with age, schooling, occupation, sex, birth cohort, and socio-economic class. Answers to these questions are important for understanding how people perceive their pension system and whether they value the future benefits it will provide. This issue was important in the recent national elections in Chile and is a key source of discussion throughout all the Latin-American nations that have moved toward systems similar to Chile's (Gill, Packard, and Yermo 2005). The results of the EPS help identify which workers can most efficiently understand and maneuver under such plans, how the plans might be made more effective, and what the distributional implications of such plans are.

Table 2-8 summarizes the results on knowledge of key aspects of the Chilean pension system. Across the top of the chart are the data source, sample, and number of included observations in each cell. Columns (b) and (c) refer, respectively, to the responses for the 2002 survey, first for the entire 2002 sample, and second for affiliates. Column (d) refers to all EPS interviewees in 2004, while columns (e)–(g) break the total down into the panel subset, new entrants (affiliates) to the pension system, and nonaffiliates.

Row A in Table 2-8 reports respondents' answers to whether they received a statement from the AFP system (the quarterly cartola, which reports past contributions and projects future benefit amounts). It must be noted that the questions differed slightly across the two years: 2002 respondents were asked whether they had received their AFP quarterly report, whereas 2004 respondents were asked whether they had received an AFP cartola in the past twelve months. In either case, the results are comparable. In 2002 60 percent of respondents said they received the statement, whereas in 2004 the fraction was 69 percent, with a similar change for the subset of panel members. Three-quarters of new affiliates, who are likely to be younger than the average respondent, affirmed they received it.

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TABLE 2-8 Knowledge of Chilean Pension System Attributes

Variable ^a	2002 Survey				2004 Survey							
	All Respondents ^b		2002 Affiliates		All Respondents		2002 Affiliates		2004 New Affiliates		2004 Nonaffiliates	
	%	n	%	n	%	n	%	n	%	n	%	n
A. Receipt of AFP statement												
1.1. Received AFP statement	60.7	12,367	60.6	5,942	—	—	—	—	—	—	—	—
1.2. Received AFP statement past 12 mos	—	—	—	—	69.2	10,131	68.8	9,324	74.3	807	—	—
B. Knowledge regarding contributions												
1. Claims knows AFP amt contrib.	52.2	13,397	51.5	10,659	38.0	13,711	46.2	10,009	39.9	828	8.8	2874
2. Gave correct amt AFP contrib.	28.0	13,397	27.0	10,659	30.9	13,711	34.3	10,009	34.9	828	17.8	2874
C. Knowledge regarding prices (commissions)												
1. Claims knows fixed AFP commiss	1.5	12,367	1.5	9,805	1.7	10,131	1.7	9,324	1.5	807	—	—
2. Claims knows var AFP commiss	2.7	12,367	2.5	9,805	2.1	10,131	2.1	9,324	1.7	807	—	—
3. Claims knows both commissions	0.6	12,367	0.5	9,805	0.5	10,131	0.5	9,324	0.5	807	—	—
D. Knowledge regarding accumulations												
1. Claims knows AFP accum.	44.9	12,367	45.5	9,805	52.7	10,131	53.7	9,324	42.1	807	—	—
2. Gave correct amt AFP accum. ($\pm 20\%$)	—	—	—	—	21.6	10,124	—	—	—	—	—	—
E. Knowledge regarding investments												
1. Knows how pension funds are invested (only 2002)	10.3	12,367	9.9	9,805	—	—	—	—	—	—	—	—
2.1. Knows about multifunds	—	—	—	—	47.4	10,131	47.5	9,324	46.8	807	—	—
2.2. Knows how many are the multifunds	—	—	—	—	32.8	10,131	33.1	9,324	30.3	807	—	—

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2.3. Knows correctly number of multifunds	—	—	—	20.2	10,131	20.2	9,324	20.4	807	—	—
2.4. Knows his/her type of fund	—	—	—	32.8	10,131	33.1	9,324	28.9	807	—	—
2.5. Knows correctly his/her type of fund	—	—	—	15.8	10,131	16.1	9,324	13.0	807	—	—
2.6. Knows the riskier fund	—	—	—	38.1	10,131	38.8	9,324	30.0	807	—	—
F.1. AFP system											
1.1. Knows female legal retirement age	83.2	13,397	82.8	10,659	13,711	79.0	10,009	73.3	828	68.5	2,874
1.2. Knows male legal retirement age	86.1	13,397	85.9	10,659	13,711	82.7	10,009	77.0	828	71.4	2,874
1.3. Knows how AFP calculates pensions	14.2	12,367	13.8	9,805	13,711	11.1	10,009	8.3	828	3.5	2,874
1.4a. Claims spouse gets survivor pension benefit ^a	66.4	13,397	66.7	10,659	9,755	64.1	7,319	61.0	384	69.8	2,052
1.4b. Claims spouse gets survivor pension benefit ^b	69.3	9,931	69.6	7,910	9,037	64.9	6,818	62.6	287	71.1	1,932
1.5a. Claims kids get survivor pension benefit	61.4	13,397	60.9	10,659	11,061	40.7	8,272	30.5	444	5.3	2,344
1.5b. Claims kids get survivor pension benefit ^b	61.4	13,397	60.9	10,659	10,599	41.3	7,944	33.0	387	5.1	2,268
F.2. Guaranteed benefits											
2.1. Claims knows reqs for min pen	22.2	13,397	22.5	10,659	13,711	34.3	10,009	19.8	828	23.2	2,874
2.2. Knows reqs for min pen	0.2	13,397	0.2	10,659	13,711	0.2	10,009	0.1	828	0.2	2,874
2.3a. Knows there is minimum pension	—	—	—	—	13,711	49.0	10,009	38.1	828	32.9	2,874
2.3b. Claims knows min pension amt	20.3	13,397	21.0	10,659	13,711	36.0	10,009	25.9	828	23.9	2,874
2.4. Gave correct value min pension amt	4.9	13,397	5.1	10,659	13,711	3.7	10,009	2.5	828	2.6	2,874

(cont.)

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TABLE 2-8 (Continued)

Variable ^a	2002 Survey				2004 Survey							
	All Respondents ^b		2002 Affiliates		All Respondents		2002 Affiliates		2004 New Affiliates		2004 Nonaffiliates	
	%	n	%	n	%	n	%	n	%	n	%	n
F.3. Welfare benefits												
3.1. Claims knows reqs for welfare pension	19.3	13,397	20.3	10,659	19.6	13,711	20.5	10,009	12.3	828	18.4	2,874
3.2. Gave correct reqs for welfare pension	2.7	13,397	2.7	10,659	3.8	13,711	4.0	10,009	1.4	828	3.9	2,874
3.3. Claims knows welfare pension amt	17.0	13,397	18.0	10,659	17.5	13,667	17.8	9,972	10.4	828	18.6	2,868
3.4. Gave correct amt welfare pension	11.2	13,397	11.9	10,659	11.9	13,667	11.5	9,972	6.9	828	14.6	2,868

Source: Authors' calculations from respondents to SPS 2002 and 2004 surveys.

Notes: Affiliation status comes from administrative data. Sample is restricted to population aged 18–60 (ages in year 2002). N = refers to the number of people who were asked the question.

^a2002 and 2004 surveys have different questions, making F1.4 and F1.5 not comparable.

^bF1.4b and F1.5b apply to more comparable subsets of people among 2002 and 2004 surveys.

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Whether the effort to provide pension information translates into useful knowledge about the pension system is quite another matter. Row B.1 of Table 2-8 shows whether respondents knew the contribution (or payroll tax) rates required for AFP accounts. Row B.2 then indicates whether the responses are correct. In 2002 slightly more than half (53%) of the respondents claimed that they knew the payroll tax rate, but just over one-quarter (28%) were correct. In 2004 fewer of the panel members (46%) claimed to know the rate, though more (34%) got the tax rate correct. Not surprisingly, new affiliates are less well informed, and nonaffiliates know little to nothing about required contributions.

Another topic of recent policy interest has to do with the commissions charged by the AFPs. If AFP participants pay little attention to investment costs, it is likely that AFPs will not need to compete among themselves to drive down prices and enhance service (Berstein and Ruiz n.d.; Valdés Prieto 2005). The results from the EPS analysis show, in Row C, that fewer than 2 percent of the respondents (panel members as well as new affiliates) know either the fixed or variable commissions in either year. Only half of 1 percent of all respondents claim to know both the fixed and variable commissions. The fact that workers and savers know virtually nothing about the costs of investing their funds suggests that there is much work to be done to educate Chileans about this key aspect of their retirement system.

Financial information regarding amounts accumulated in workers' retirement accounts, and how the funds are invested, is reported in rows D and E. Line D.1 indicates that 45 percent in the 2002 survey claimed to know their AFP balances, with the fraction thus knowledgeable rising to over 50 percent 2 years later. Among panel members interviewed in both waves, 20 percent had more information in the second period than in the first. It is also of interest that new affiliates are relatively well informed, with 42 percent saying they knew their balances. Line D.2 indicates how accurately respondents in 2004 reported their AFP balances compared to administrative records. Estimated balances are within 20 percent of administrative amounts for 21 percent of the sample. Overall, it would appear that Chilean AFP participants are about as informed as their US counterparts in corporate pensions. For instance, Gustman and Steinmeier (1999) find that US workers tend to understate their DC assets by about 30 percent, at the median, as compared to administrative records, and by half in the middle and upper tiers. Furthermore, the low fraction of those who can offer accumulation estimates suggests that many workers are not well apprised of a key retirement asset.

For the first two decades of life of the Chilean AFP system, affiliates could decide only which AFP they wanted to invest with but could not diversify their holdings across AFPs, nor could they choose asset allocations. In 2000 the government permitted the AFPs to open a more conservative account

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for retirees or those within ten years of legal retirement. In 2002 each fund administrator was permitted to expand the number of investment offerings from two to five to allow participants to diversify their asset allocations. Under this new 'multifund' structure, each AFP must offer a so-called Fund A, which invests 80 percent of the portfolio in equities; Fund E, which holds 100 percent fixed income; and Funds B–D, which hold intermediate fractions of equities. Workers may elect to hold up to two funds in a single AFP at a time.

What Chileans indicate that they know about their pension investments is summarized in Section E of Table 2-8. Line 1 shows that respondents in 2002 did not know much about their pension investments (10% claimed to know), but this finding is not surprising given that affiliates had not yet been granted access to a variety of fund choices. By 2004 almost half of the respondents claimed that they knew about the multifund setup, though only one-third said they knew the number of funds, and only about one-fifth could give the correct number of total funds. Further, in 2004, only one-third of respondents said they knew which funds they held, but only 16 percent were accurate and only 38 percent were aware of which fund was the riskiest.

Regarding retirement system payouts, Section F of Table 2-8 breaks the results into three topic areas. The first part summarizes what people know regarding the AFP system payouts. The second part reviews what individuals know about the MPG. The third part illustrates what people know about the minimum welfare benefits, or PASIS.

Several key questions arise regarding the rules pertaining to eligibility and access to benefits. For instance, the legal minimum retirement age refers to the age at which eligible retirees may claim benefits. In 2002 knowledge about the legal retirement age for men and women appeared widespread—roughly 83–86 percent accurately reported these ages (lines F1.1–1.2). By 2004 the percentages fell a bit, mainly due to the inclusion of nonaffiliates in the overall sample, though the percentages for panel members also showed a decline. Line 1.3 shows that few people responded that they knew how AFP benefits were calculated, with 14 percent of the panel in 2002 falling to 11 percent 2 years later. Almost two-thirds of respondents claimed to know the rules for spouse and dependent benefits, but again the percentages fell between years for the same panel sample. It must be acknowledged that many are simply unaware of the social insurance coverage that spouses and children receive when the worker contributes to the AFP system.

Also of interest is the question of whether respondents know about requirements for the MPG as well as the benefit level. Some pundits have suggested that requiring twenty years of contributions for eligibility might induce workers to drop out of formal sector jobs, and recently some analysts

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have opined that the minimum benefit might need to be raised (Rohter 2006). The EPS research shows (lines F2 in Table 2-8) that very few respondents in 2002 knew the requirements for the minimum pension benefit, and only a very tiny minority could accurately report the requirements for the MPG (0.2% or fewer). Regarding financial literacy, there was an increase in the panel's awareness of the minimum pension between 2002 and 2004, rising from 22 to 34 percent, but the accuracy of their knowledge declined.

The final section of Table 2-8 focuses on respondents' knowledge of PASIS, which is a means-tested payment to the indigent. Interestingly, about 20 percent of the respondents in both 2002 and 2004 claimed they knew the eligibility requirements, with no important difference between affiliates and nonaffiliates in 2004 (new affiliates knew the least). In addition, only 3–4 percent of the respondents actually knew the correct eligibility requirements for these payments. Similarly, a relatively large percentage (approximately 17%) claimed to know the value of the welfare payment. However, only about 11 percent accurately stated the value. Those most likely to need the PASIS benefit—namely, nonaffiliates—were no more likely to be aware of program eligibility rules than others. However, those nonaffiliates who did know that there was a welfare pension were better informed about the benefit level than were others. Nonetheless, the low level of awareness among the population who are most likely to need the benefit is striking.

Among retirees, knowledge is generally more accurate than among workers (see Table 2-9). Most people who are retired according to administrative records also self-report they are retired (84%). Some two-thirds of the retirees know what kind of pension they are receiving, and about 64 percent know the benefit amount (with an accuracy of $\pm 20\%$), though the retired tend to report smaller benefits than are indicated by the administrative data. Using the EPS, we can compare respondent questions about payouts with the administrative records. Comparing those for whom we have both self-reports and administrative data linkages, and focusing first on those who say they took the programmed withdrawal payout option, Panel A indicates that beneficiaries understated the value of their payouts by about 7 percent. That is, at the median, retirees self-reported benefits of only \$69,000 pesos, compared to \$74,000 pesos from the administrative records. For those receiving life annuities, the degree of understatement was even more substantial, with retirees reporting benefits about 10 percent lower than actually paid. The degree of understatement was less at the low end. Panel B shows that retirees who said they knew what type of income they received generally had lower actual benefits than did those who did not know. Panel C contains official data that show that, as of December 2005, the Chilean pension system had some 377,000 old-age retirees, of

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TABLE 2-9 Pensions under the AFP System: Self-report vs Administrative Records

<i>Percentile</i>	<i>Self-Report Amt</i>	<i>Admin. Amt</i>	<i>Diff.</i>	<i>Percentage</i>	
<i>A. Pensions, AFP System: Self-Report vs Administrative Records^a (04 Chilean Pesos)</i>					
<i>For Those with Self-Reports and Administrative Records in AFP: Phased Withdrawal</i>					
<i>(Median of the Percentile) (N=148)</i>					
p25	65,000	60,667	4,333	6.7	
p50	69,420	74,175	-4,755	-6.8	
p75	70,000	74,883	-4,883	-7.0	
<i>For Those with Self-Reports and Administrative Records in AFP: Life Annuity</i>					
<i>(Median of the Percentile) (N=604)</i>					
p25	70,000	73,454	-3,454	-4.9	
p50	85,000	93,041	-8,041	-9.5	
p75	130,000	142,361	-12,361	-9.5	
<i>For Those with Self-reports and Administrative Records in AFP</i>				<i>%</i>	<i>N</i>
<i>B. Pensions in the AFP System: Knowledge^b</i>					
B.1. Know that have a retirement pension				84.4	1,092
Life annuity				92.8	702
Phased withdrawal				72.6	440
Temporary income				95.5	64
Median pension of those that know				78,602	
Median pension of those that don't know				129,430	
B.2. Claim knows his/her type of pension				82.0	911
Life annuity				89.4	648
Phased withdrawal				68.1	308
Temporary income				92.4	60
Median pension of those claim know				81,126	
Median pension of those claim don't know				92,256	
B.3. Know correctly his/her type of pension				66.0	911
Life annuity				74.9	648
Phased withdrawal				52.1	308
Temporary income				73.2	60
Median pension of those that correctly know				91,085	
Median pension of those claim don't know correctly				110,998	
B.4. Know his/her amount of pension ($\pm 20\%$)				63.9	676
Life annuity				68.2	539
Phased withdrawal				57.0	179
Median pension of those that know their amount of pension				91,760	
Median pension of those that don't know their amount of pension				121,013	

Source: Authors' computations from the EPS 2002 and administrative linked data.

^aOld-age pension, phased withdrawal, and annuities.

^bPanel 2002-4, old-age pension include phased withdrawal and life annuity.

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TABLE 2-9 (Continued)

	<i>Phased Withdrawal</i>	<i>Life Annuity</i>	<i>Temporary Income</i>
<i>C. Number of Benefits in the AFP System: Official Figures</i>			
<i>Old Age</i>			
1990	16,893	12,689	84
2000	76,710	142,446	6,217
2005	115,236	256,107	5,786
<i>Disability</i>			
1990	4,095	2,645	45
2000	12,045	7,840	396
2005	22,496	14,475	1090
<i>Survival</i>			
1990	15,176	4,857	19
2000	55,229	38,402	19
2005	71,057	62,507	40

Source: SAFF.

whom almost 70 percent were receiving benefits in the form of a life annuity.²³

Implications and Conclusions

It is fitting that the Chilean pension reform is receiving much attention as it celebrates its Silver Anniversary. Despite the attention and continued debate about the system's impacts, little attention has been paid to the microeconomic aspects. The EPS is a recently developed longitudinal survey of about 20,000 individual respondents that has provided valuable new information for microeconomic analyses of key aspects of the Chilean pension system. Significantly, strengthening the EPS data are the links between respondent records and a wide range of historical administrative files on contribution patterns, benefit payments, and other program features. Accordingly, the EPS represents a substantial advance for analysts interested in important micro questions related to the operation of the new Chilean retirement system.

To illustrate some of the richness of the new information available, this chapter presents new analyses regarding three key policy questions:

- *Who participates in the Chilean retirement system, and what do lifetime contribution patterns look like?* We find that, on average, men report almost 40 percent higher months of AFP contributions than do women, which is not surprising, given that many women interrupt their labor force careers to rear children. Men report about one-fifth and women report

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about one-quarter higher months of contributions than indicated in the administrative records, which suggests that self-reports underestimate the extent of shortfall in coverage for sufficient months to satisfy the twenty-year minimum contribution requirement for the MPG for participants in the AFPs, somewhat more so for women. Thus, the probable extent of dependence on the PASIS is greater than would be indicated by self-reports. Also not surprising is the positive relation between reported months of AFP contributions and age, with an increase on average in reported months of contribution of one-third of a month for every additional month of age over the prime working years between the age groups 26–30 and 51–55 years. What is somewhat surprising is that self-reports do not differ with schooling attainment. On the other hand, administrative records indicate a positive association with schooling attainment, at least for those who have completed high school or more. It seems, therefore, that self-reports are likely to overstate somewhat the relative extent to which those with less schooling are likely to satisfy the twenty-year minimum contribution requirement. Finally, spells of reported noncontributions are strongly associated with nonemployment, which suggests that to increase coverage, efforts might best be directed toward reducing these nonemployment spells.

- *What have people accumulated in the Chilean retirement system, and what benefits may be anticipated?* The 2002 EPS shows that reported contributions must take place over a high percentage of an individual's work life to have replacement rates of over half. For example, a 65-year-old man would have to contribute for 80 percent of his work life to have a replacement rate of 60 percent. When the percentage of the work life during which an individual makes contributions falls, the replacement rate falls on average by as many or more percentage points. The findings cited earlier show that the EPS respondents who claimed to know their AFP accumulations report balances that are close to those in the administrative records. In contrast, those who did not know their AFP balances according to the administrative records have much lower balances on average. The findings also indicate that for respondents entitled to RBs, such bonds are worth about as much as are their AFP assets. It is therefore important that assessments of probable financial position on retirement include the RBs with AFP balances.
- *How financially knowledgeable are Chileans about their retirement system?* While about two-thirds of AFP affiliates affirmed that they receive periodic reports on past contributions and projected future benefits, much smaller proportions know critical details such as payroll tax rates and commission rates. That such a small percentage of AFP contributors know the rates suggests that work is needed to increase the effective competition among AFP providers. The majority of AFP

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plan participants also do not know their AFP balances, details on the multifund system, or details of the eligibility requirements for minimum pensions. On the other hand, among those who claimed to know their AFP balances, they appear better informed about their accumulations than their US counterparts in corporate pensions, and the fraction of respondents who claimed to know their AFP balances increased between 2002 and 2004. It is clear, however, that knowledge about retirement benefits is far from perfect. Although most people retired according to administrative records also self-report they are retired, only two-thirds of the pensioners know what kind of benefit they receive and 64 percent know the amount of the benefit (give or take 20%). In other words, it appears that information gaps are considerable, which necessarily limit the effectiveness of the system.

Ultimately, to have a more resilient pension system, people will need a better appreciation of exactly what is required for eligibility to each of the pillars. In addition, greater financial literacy would enhance contribution and investment patterns. Greater knowledge of commissions and related matters is also essential in making a more competitive AFP system. Finally, for the government to make useful budgetary projections, better data are needed on who is in the system, who is contributing, and who is likely to try to obtain the MPG or PASIS benefits.

If the system is to survive to its next quarter-century mark and beyond, then it will have to be politically resilient—a difficult goal to attain if few Chileans obtain AFP benefits or if replacement ratios prove low. It is likely that political pressures will grow to raise MPG and PASIS pensions, with negative fiscal implications. And if people do not accumulate enough, there will also be pressures to allow phased withdrawals instead of annuitizing the payoffs—another significant financial risk for the government.

It is essential, of course, at this quarter-century mark, a time of taking stock of the Chilean pension system, to recognize that the system is still very young and in transition. Most people retiring now were actually not covered by the new system over their entire work lives. Rather, today's retirees continue to rely more heavily on RBs than on AFP accumulations. It is still unknown how well future retirees who spend their entire lives under the system will do. Initial analyses of the EPS data suggest both the value of further analysis and that there are some concerns that must be addressed to help the system to become more effective and efficient.

Notes

¹ Other Latin-American countries that implemented similar changes to their pension systems include Peru (1993), Colombia (1994), Argentina (1994), Uruguay (1996), Bolivia (1997), Mexico (1997), El Salvador (1998), Costa Rica (2001), the

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Dominican Republic (2003), Nicaragua (2004), and Ecuador (2004). Cogan and Mitchell (2008) discuss prospects for funded individual DC account pensions in the USA.

² Many have written on the Chilean pensions system (cf. Cheyre 1988; Iglesias and Acuña 1991; Baeza and Margozzini 1995; SAFP 1996, 2002). Implementational and operational aspects have been explored by Diamond (1993), Diamond and Valdés Prieto (1994), Arenas de Mesa (1997), and Mesa-Lago and Arenas de Mesa (1998). Fiscal aspects of the reform are the focus of other work (cf. Ortúzar 1988; Marcel and Arenas de Mesa 1992; Arenas de Mesa 1999*b*). Arenas de Mesa and Marcel (1999*a*) have estimated the financing costs associated with the transition (from the old PAYGO to the new funded system) and minimum basic pension guarantees. Yet a common characteristic of these studies and most studies on the Chilean pension reform is the use of aggregate and macroeconomic information. In fact, the implications of the pension reform on aspects such as private savings are usually deduced from simple aggregate correlations of macroeconomic indicators (even though Chile experienced a significant number of concurrent economic reforms) or from simulations carried out on general equilibrium models (the pioneering application in this respect was Arrau 1991). Even when analysts looked at specific aspects such as the minimum basic pension, they have simulated representative individuals because they lacked microeconomic data. Accordingly, they did not consider individual heterogeneities critical for questions of equity (cf. Wagner 1991; Zurita 1994).

³ This section draws heavily on Arenas de Mesa (2005).

⁴ This institution also manages the retirement systems of the armed forces (Caja de Previsión de la Defensa Nacional, or CAPREDENA) and the police force (Dirección de Previsión de Carabineros de Chile, or DIPRECA).

⁵ This is a lump sum paid to workers at retirement by the government. The sum is based on the last twelve monthly contributions before June 1979 and is adjusted by the proportion of total years under the public system and an annuity factor. The RBs are expected to cost around 1% of GDP per year for the period 2000–20 (Arenas de Mesa and Marcel 1999).

⁶ Mandatory system contributions are capped at a ceiling earnings level of approximately US\$1,500 per month; fewer than 5% of AFP contributors earn over that ceiling.

⁷ In response to high levels of churning across AFPs, the Superintendency of the AFP system in 1997 required participants to file paperwork in person at their AFP, a move that greatly diminished the rate of fund switching.

⁸ Additional factors influencing pension amounts are the worker's life expectancy (derived from age- and sex-specific official life tables) and the worker's number of survivors at the time of retirement. Retirees have three withdrawal options: (a) *Retiro Programado*, or 'Programmed Retirement', which allows a system of phased withdrawals from the accumulated funds and where the pension amount is recalculated every year; in this case, the pension is paid by the AFP; (b) a real lifetime annuity from an insurance company (*Renta Vitalicia*)—in this case, the AFP transfers funds to the insurer, which in turn makes monthly payments; and (c) some mix of phased withdrawals for a determined period and a deferred lifetime annuity.

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⁹ The current minimum monthly pension is US\$105, while the minimum wage is about US\$150 per month.

¹⁰ Early retirement may be permitted if the worker can demonstrate that his or her early retirement benefit would be at least 110% of the minimum pension benefit level and 50% of his or her average monthly contributions over the past 10 years (currently, 60% of pension benefits paid by AFPs are for early retirement).

¹¹ All pension system variables (pension funds, yields, and benefits) are measured in unidades de fomento (UF), an accounting unit indexed to inflation. That the pensions are automatically inflation-adjusted solves a longstanding and serious problem of Chilean social insurance. Unlike regular pensions, however, the minimum pension is not indexed against inflation but is instead periodically adjusted by the government.

¹² The AFP system currently covers nearly half as many pensioners as the INP system, has more beneficiaries than the welfare PASIS pension, and includes three times as many beneficiaries as the public pension system for the armed forces (Arenas de Mesa 2004).

¹³ The 2002 survey was initially called the 2002 Historia Laboral y Seguridad Social (HLSS) survey, or History of Labor and Social Security. But the follow-up 2004 and 2006 longitudinal surveys are called Encuesta de Previsión Social (EPS), or Social Protection Surveys. To avoid awkward terminology, in this chapter we refer to the 2002 data as well as the subsequent rounds of data as EPS, or Social Protection Surveys. The interested reader is referred to <http://www.proteccionsocial.cl/english/presentacion2002.htm> for access to the public use data, codebooks, and documentation of the survey.

¹⁴ Information on the methodology and extent of the survey can be found in Bravo (2004). Members of the armed forces or police covered by separate government pension systems were excluded, as well as a very small percentage of the Chilean population residing in inaccessible or sparsely populated areas (e.g. islands).

¹⁵ A number of the questions were adapted from the US Health and Retirement Study (HRS) with the intention of providing cross-national comparisons.

¹⁶ The sample is reweighted using sampling weights, so it represents the national population.

¹⁷ Further rounds of the survey were planned for 2006, 2008, and 2010.

¹⁸ The sample size for which we can currently link self-reports and administrative AFP records for the EPS 2002 is 11,305.

¹⁹ The reader should be reminded that as the AFP system has been in place only since the early 1980s and tabulations run to mid-2002, the maximum possible number of months in the chart can total only about 260.

²⁰ Data on AFP contributions are available only from 1981. INP contribution patterns may become available in the future but to date these are unavailable for analysis.

²¹ Another reason that the self-reports of contribution months are higher is that the EPS labor history asks for job beginning and end dates. Our calculation assumes that contributions were made without interruption on each job, which may produce an overstatement of contributions if layoffs or other interruptions occurred but are not accounted for in the reported beginning and end dates.

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²² That analysis assumes that workers' initial taxable earnings were CP\$200,000 (below twice the current minimum wage); that real earnings would grow at 2% per year to 50 years of age; that pension investments would earn 4% real per year; and that the worker would pay fixed monthly commissions of CP\$500.

²³ This data confirms recent findings by James, Martinez, and Iglesias (2006) on payouts under the Chilean pension system.

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