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THE CHILEAN PENSION REFORM:
A PIONEERING PROGRAM

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ABSTRACT

In the mid-1970s Chile initiated a deep market-oriented reform program aimed at opening up the economy, privatizing state owned enterprises and stabilizing the macroeconomy. In the 1980s Chile began to grow at increasingly rapid rates -- between 1986 and 1995 the average rate of growth bordered 7% --, becoming a star performer. Perhaps one of the most admired aspects of the Chilean program has been the reform of the pension system, which replaced an inefficient pay-as-you-go system with a privately administered defined contribution one. This reform has been credited with helping develop Chile's capital market, with reducing government contingent liabilities and with helping boost Chile's traditionally anemic savings rate. The purpose of this paper is to analyze the most salient aspects of the Chilean program and to evaluate its achievements to date. The paper provides a brief background of the Chilean reforms effort and deals with Chile's old pay-as-you-go system, including its degree of (in)efficiency, its distributive characteristics and its fiscal consequences. The functioning of the new privately managed system is discussed in detail, and the system's results up to date are evaluated. I also discuss transitional issues, including the fiscal consequences of the reforms. Finally, the analysis also deals with the reforms effects on labor markets and savings.

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I. Introduction

For decades the Chilean economy was characterized by a lukewarm performance. Growth was modest, inflation was among the highest in the world and the degree of social conflict was high. Already in the nineteenth century international observers argued that, in spite its natural beauty, the country's economy was rather unexciting. Some even blamed this state of affairs on the lack of creativity and work ethics of Chileans. This view was vividly expressed in 1885 by H.W. Bates, the Assistant Secretary of the Royal Geographic Society, when he argued that the typical Chilean was a "half breed of the Spaniard and Indian, and like the inhabitants of all the warmer climates, ...love[s] best the *dolce far niente* (p.379)".

Throughout most of the 20th century the role of the state grew relentlessly in Chile. Regulations were piled on top of regulations, and state owned enterprises became increasingly important. This heightened government intervention was supposed to accelerate growth and help reduce inequality. Nothing of the sort happened, however. In fact, during the first seven decades of the 20th century Chile was a timid performer-- during this period the country experienced one of the lowest rates of growth in Latin America.

And then, in the late 1980s things changed dramatically. As a result of a deep and daring market-oriented reform program initiated in the mid 1970s, the country began to grow at increasingly rapid rates -- between 1986 and 1995 the average rate of growth has bordered 7%. Chile has not only become a star performer, but her reforms have attracted considerable attention around the world. More and more analysts are studying the Chilean experiment in order to understand how to move successfully towards market orientation. Perhaps one of most admired

aspects of the Chilean program has been the reform of the pension system, which replaced an inefficient pay-as-you go system by a privately-administered defined contribution one.[1] This reform has been credited with helping develop Chile's capital market, with reducing government contingent liabilities and with helping boost Chile's traditionally anemic savings rate. A large number of pension reforms around the world are now being tailored after Chile's pioneering program. For example, by the mid 1990s, six other Latin American countries had followed Chile's lead and had reformed (to different degrees) their social security systems. More important, perhaps, enough time has elapsed since implementation of the reforms, allowing for an evaluation of the program.

The purpose of this paper is to analyze the most salient aspects of the Chilean program and to evaluate its achievements to date. The paper is organized as follows: section I is the introduction; section II provides a brief background of the Chilean reforms effort; section III deals with Chile's old pay-as-you-go system, including its degree of (in)efficiency, its distributive characteristics and its fiscal consequences. Section IV is the core of the paper and deals with the reforms per se, and focuses on the functioning of the system. Section V concentrates on the system's results up to date. Section VI discusses transitional issues, including the fiscal consequences of the reforms. Section VII deals with the reforms effects on labor markets and savings. Finally, section VII contains the concluding remarks.

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[1]As I point out in section II the Chilean system, as most Latin American systems for that matter, was not created as a pay-as-you-go system. Originally the accumulation of reserve funds was contemplated. In reality, however, it quickly became a de facto pay-as-you-go system. Through out the paper, thus, I will refer to it as such.

II. The Chilean Market Oriented Reforms: A Brief and Selective Overview

The Chilean market-oriented structural reform program was initiated in 1975, ten years prior to the launching of the rest of the Latin American reforms. The program was based on three basic policy measures: (a) a drastic opening of the economy; (b) an ambitious privatization and deregulation program; and (c) a stabilization based on a predetermined nominal exchange-rate anchor, supported by (largely) restrictive fiscal and monetary policies. Table 1 contains a summary of the policies undertaken during the first ten years of the Chilean reforms.[2]

Chile opened up its economy to international competition in the mid-1970s. After decades of protectionism, import licenses were fully abolish and import tariffs were reduced from an average that exceeded 100% to a uniform 10% level. As a result of Chile's integration to the rest of the world, local firm's were forced to increase their degree of productivity. By the early 1990s Chile's exports were booming and had clearly become the country's engine of growth.

Between 1974 and 1992 the Chilean government privatized more than 500 firms. This process was carried out in two rounds—the first during the mid- and late-1970s, and the second during the mid-and late-1980s. These two efforts were separated by a brief interlude, between 1982 and 1984, when there was a partial reversal in the process and the government had to take over more than 50 banks and firms.

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[2] On the Chilean reforms, see Harberger (1985), Edwards and Edwards (1991) and Bosworth et al. (1994).

The first round of privatization (1974-1982) had two distinct components. The first was the return of firms seized by the Unidad Popular during 1970-73 to their original stockholders.[3] The second consisted of the sale of a large number of banks and firms to the private sector. Some of these companies had been nationalized during the Allende administration, while others had traditionally been under government control. In an effort to sell large number of companies fast, the government made no effort to restructure them before offering them to the public. Many of these firms were in serious financial difficulties, and all of them had major productivity problems. It was expected that buyers would implement the necessary steps to improve efficiency. To that effect the government placed very few restrictions on the buyers' ability to lay-off redundant workers.

During the second round of privatization, started in 1985, the authorities' main objectives were to reduce very significantly the size of the government and to spread ownership. The first step in this second round consisted of reprivatizing those firms that had failed during the financial crisis of 1982. This time, however, the government did not provide credit, and carefully checked the financial credentials of prospective buyers. Financial institutions—including two of the largest banks—were privatized through a scheme known as "popular capitalism", where private individuals were allowed to buy a limited amount of shares—up to US$7,000—at a discounted value.[4]

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[3]These firms had not been nationalized. The Allende administration used an obscure piece of legislation from the 1930s to "intervene" companies whose products were in "short supply". See Edwards and Edwards (1991) for details. Also, see Larrain and Meller (1991).

[4]See Luders (1991) for details.

In the late 1980s the Chilean government greatly broadened the scope of privatization by selling large public utilities and firms that had always been in government hands, including the largest steel mill, the national airline and most utilities—telephones, electricity, water. During this phase the government exercised great pragmatism, combining different modes of privatization even for a given firm. Shares were sold -- usually at discount -- to workers, to foreigners, to local private companies, and to the newly created pension funds.

During the second phase of privatization, the Chilean government introduced sweeping regulatory reforms. Particularly important were the laws establishing operating and servicing rules for utilities. The main principle behind this new set of regulation was that entry and price setting would be left to the market in those areas with a high degree of competition or contestability. The government would regulate technical aspects—including those related to safety—and price setting in areas where markets were imperfect.

In an effort to shield the real sector from the effects of inflation, in the 1970s the Chilean authorities developed a comprehensive indexation program for the financial sector. At the heart of this mechanism was the creation of a unit of account called *Unidad de Fomento* (UF), whose value changes daily according to (one month) lagged inflation. Starting in the mid 1980s (and until the time of this writing) virtually every financial contract exceeding 90 days has been expressed in terms of UFs. As a result of this, interest rates on longer term securities are generally expressed (and negotiated) in real terms in an ex ante fashion. This, as will be seen below, has added an important component of predictability to Chile's capital market and to the privately managed pensions system.

Many observers forecasted that the new Chilean democratic government that took over in 1990 would put an end to the divestiture process and would even repeal some of the privatizations of the military regime. However, nothing of this kind happened. In fact, after some heated debate on the subject, the government of President Aylwin decided to *continue* the privatization process.[5] By the mid 1990s Chile's market-oriented reforms had become consolidated, as the leaders of virtually every political party agreed with the merits of the new system. The country was growing at a rapid and steady rate, unemployment was around 5%, and poverty was in retreat. Foreign observers, marveled with the country's transformation, continued to analyze the sources of this success story. More often than not they pointed out to the pension reform as one of the central elements of the Chilean miracle.[6]

III. Chile's Traditional Pay-as-you-go Pension System

As most Latin American countries, Chile adopted a social security system in the 1920s. The original system was not, as it has been often argued, a pure pay-as-you-go one. During its early years, when contributions made by active workers exceeded pension payments, it was based on the collective capitalization of funds. As the system became more mature, it was expected that increasing obligations would be met both by drawing on these funds, and by increasing active worker's contributions. Accumulated funds, however, were poorly managed and benefits -- especially for the better to do -- escalated quickly. As a result, the system ran into

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[5]See El Mercurio (Edición Internacional, 7-14, January 1993).

[6] See, for example, the America's column in the June 28, 1996 issue of the Wall Street Journal.

serious financial difficulties and, increasingly, relied on the government to meet its obligations. For all practical purposes, and in spite of the original intentions of its founders, by the 1970s the system had become an insolvent pay-as-you-go regime.

One of the most important characteristics of the old system was its lack of uniformity. There were more than 100 different retirement regimes. While some workers could retire with a very high pension at 42 years of age, blue collar workers could only retire once they turned 65, and yet others could retire at 55 years old with a full pension. Some pensions were not subject to automatic cost of living adjustment. Senior bureaucrats, however, got 100 percent-plus inflation adjustment, as they maintained, through life, a pension equal to the salary paid to an active worker in a position similar to the last one they held. After 50 years of operation, and contrary to its architects intentions, the system had become increasingly unfair. While upper and middle class workers were able to reap substantial benefits, poorer workers continued to face tough requirements to obtain a pension that was largely eroded by inflation. As a consequence of inflation and mismanagement, between 1962 and 1980 the average pension paid to a blue collar worker had declined by 41%.

Chile's traditional retirement system was characterized by very high contribution rates. In 1973, for example, total contributions -- by employers and employees -- varied between 16 and 26 percent of wages, depending on the type of job the individual held. By 1980 total contributions had been reduced, on average, to an average of 19 percent of (taxable) wages.[7]

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[7] There has been some confusion on the actual level of contributions in the old system. The reason for this is that these rates have traditionally been quoted as a social security aggregate, covering pensions, health and disability. Total contributions were 54.4% in 1973, and were reduced to 37.6% in 1980 (Larrain, 1991). The rates quoted above refer to pensions only.

What made things worse was that there was almost no connection between retirement contributions and (perceived) benefits. In that regard, then, these contributions were largely seen as taxes on labor, and contributed significantly to the poor performance of the country's labor market during the 1960s and 1970s (Cox Edwards, 1992).

Demographic trends worked steadily against Chile's traditional retirement system. While in 1955 there were 12 active contributors per retiree, this figure had declined to 2.5 by 1979. As a result of this, and of a highly inefficient management, the Chilean system became increasingly unfunded. By the early 1970s the system as a whole was already running a dramatic deficit. The gap between revenues and outlays -- administrative costs plus pensions -- was made up by the public sector. By 1971 the central government's contributions to the system were already 4% of GDP, and the present valued of the system's contingent liabilities exceeded 100% of GDP.[8]

In 1981 the military government decided to introduce a sweeping reform to the retirement system. The decision to undertake the reform responded to four considerations: (a) the explosive fiscal consequences of the old regime; (b) the high degree of inequality of the old system; (c) its implied efficiency distortions; and (d) an ideological desire to reduce drastically the role of the public sector in economic affairs. Interestingly enough, in explaining the reform the Chilean authorities barely referred to the (potential) effects of the new system on domestic savings.[9]

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[8] See Meyers (1988) and Cheyre (1988) for an analysis of the flow deficit of the system. I have used data reported by them and Larrain (1991) to make a calculation of the magnitude of the present value of the system's unfunded liabilities.

[9] The father of the reform, then Minister of Labor José Piñera, has provided a fascinating account of the political economy of the reform. See Piñera (1991).

IV. The Chilean Social Security Reform

On November 4th 1980, Chile's military government approved decrees number 3,500 and 3,501, which drastically reformed the country's social security system.[10] In a speech delivered on November 6th, 1980 Minister of Labor José Piñera expressed that the goal of the reform was to create a retirement system based on "freedom, and solidarity; a fair and yet efficient retirement system; a retirement system for everyone." He went on to say that the reform was a "transcendental step that would benefit every Chilean, within the spirit of freedom, progress and justice" (Piñera, 1988 p. 318).

From a political point of view, the launching of the reforms faced some difficulties. First, many interest groups -- including public sector workers, teachers and workers in the health sector -- firmly opposed any changes. Representatives of these groups realized early on that their best option was to line up the support of high-rank military officers. They were partially successful, as for many months some key members of the (ruling) armed forces opposed the project. Second, the notion of a collectively funded, "solidarity-based" retirement system was deeply ingrained among intellectuals and the public. José Piñera, the father of the reforms, has pointed out that due to stiff opposition the implementation of the reform had to be postponed for almost a full year. It was only in 1980 when Piñera and his team were able to persuade a reluctant General Pinochet on the merits of the project. The general himself, however, was not fully successful in convincing his military colleagues. The armed forces did not join the new system -

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[10] Paradoxically, November 4th 1980 was the tenth anniversary of President Salvador Allende's inauguration. President Allende had also promised to reform the country's social security system. His program, of course, was radically different from that of the military and called for an even greater role for the public sector.

- an option not available to any other group in the country. As a way to increase the appeal of the new system, and reduce political opposition, the architects of the plan determined the new contribution rates at a level that resulted in an increase of net take-home pay for those that joined the new system. On average those that transferred to the privately run capitalization system experienced an 11% increase in after tax pay (Iglesias and Vittas, 1992). This increase in take-home earnings was engineer largely as a way of making the reforms popular, and generating an incentive to encourage workers to shift voluntarily to the new system. At the same time, it was expected that, given the anticipated higher rates of return on the accumulated funds, the lower contributions would be enough to finance higher rates of replacement for pensions.

In spite of some political difficulties, there is no doubt that, given the dictatorial nature of the Chilean government of the time, the authorities faced a significantly lower degree of political opposition than what they would have encountered in a democratic regime. Some authors have, in fact, argued that due to political considerations in most Latin American countries it is unfeasible to implement a Chilean type reform (Mesa Lago, 1996).

IV.1 Fundamental Aspects of the Reform

The reform of Chile's social security system replaced a basically insolvent pay-as-you-go regime with a capitalization system, based on individual retirement accounts managed by private companies known as "*Administradoras de Fondos de Pensiones*", AFPs.[11] Each AFP can

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[11]In the reformed system, the State plays a fundamental role regulating and monitoring the operation of the management companies, and guaranteeing "solidarity in the base" through a minimum pension. An important feature of the new social security system is that it is obligatory, requiring that every worker (non-self-employed) makes contributions equal to 10% of her disposable income.

manage only one retirement fund, and there is a strict separation between the retirement fund and the management firm's assets. . This one-fund-per-AFP rule, in conjunction with a regulation that establishes a minimum rate of return on the funds, have resulted in a low degree of actual portfolio diversification across AFPs.

Workers have the freedom to choose the AFP they want to be affiliated to, and can transfer their funds freely among them. When they retire they can choose to buy an annuity, or to withdraw their funds according to a predetermined (actuarially fair) plan.[12] The system also has survivor's benefits (term life insurance) and a disability program funded with an additional insurance premium. A detailed and modern regulatory framework -- enforced by an institution especially created for this purpose, the Superintendency of AFPs -- regulates investment portfolios, ensures free determination of fees and commissions and free entry into the industry. The Superintendency of AFPs established from the first day very precise norms to secure the diversification and transparency of AFP investments (see table 2 for a list of key legal requirements for operating an AFP).

Since its inception, the new Chilean retirement system has gone through a number of changes. Between November 1980 and August of 1995 there have been 30 modifications of the original legal texts. Of the 97 permanent articles of Decree 3,500, only 12 have not been modified during the first 15 years of the reforms (Serqueira, 1995). In this subsection I describe

[12] At this time there are not enough (available) data to analyze the efficiency of the annuities market. There have bee some claims, however, that these still have a very high price, that exceeds the actuarially fair price. See Vittas (1995).

with some detail the evolution of the system during its first 15 years. In the subsections that follow I deal with issue related to investment regulations, accumulated funds and rates of return.

Coverage and Contribution Rates: Workers employed in the formal sector are required, by law, to participate in the retirement system. They have to contribute, to the AFP of their choice, 10% of their wages. These are invested by the AFP and are accumulated in an individual retirement account. Participants can switch management funds up to four times a year.

There is an additional contribution of (approximately) 3% of wages as a premium for term life and disability insurance. Both of these contributions are subject to a maximum wage base, which is currently equivalent to approximately US$ 2,000 per month.[13] Self employed workers are not required to participate in the system. They have the choice, however, to set retirement accounts which are (basically) subject to the same regulations as those of formal sector employees.

In analyzing the degree of coverage of the reformed Chilean system it is important to distinguish between those workers that are *affiliated* to the system -- that is workers that have, at one time or another, enrolled in an AFP --, and those that are active *contributors* to the system. While the percentage of individuals affiliated to the system is very high -- almost 99% of the labor force --, the percentage of active contributors is significantly smaller, and in 1995 stood at 58% of those employed. In addition, in 1994 those still affected by the old system represented

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[13] The amount of the maximum "pensionable" salary is set in *Unidades de Fomento (UF)*, Chile's indexed unit of account. The limit is 60 UFs per month. In October 1996 this was equivalent to US$ 1,901.

5.5% of total employment. The total coverage of the Chilean retirement system amounted, then, to 63.5% of employed, approximately the same percentage as in the prior traditional system.

The relatively low percentage of active contributors is one of the most important weaknesses of the system, and is explained by two basic factors: first, self-employed are not required to participate in the system and, for a variety of reasons, including tax considerations, have no incentives to make voluntary contributions.[14] Second, the existence of a government-guaranteed (universal) minimum pension creates a moral hazard situation among low income workers, many of which are self employed (see the discussion below for greater details). In their case it pays to contribute only sporadically, and only enough as to obtain the minimum pension once they retire.

Tax Treatment and Voluntary Contributions: In addition to the required contributions, employees can make voluntary contributions to the same AFP where they have their retirement account.[15] Voluntary contributions have a limit of US$ 2,000 per month. Required contributions are tax deductible, as is the income accrued to the accumulated fund during the contributor's active life. Voluntary contributions, on the other hand, are not tax deductible. Income accrued to voluntarily contributed funds are, however, free of taxes. Once the worker retires, however, their pension becomes subject to income tax, as any other source of income.

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[14] Although, as explained below, voluntary contributions are (up to a limit) tax deductible, by contributing to an AFP a self employed worker is revealing information to tax authorities.

[15] There is no especial treatment for married couples.

In spite of tax incentives and of the splendid financial result of the AFPs (see below for details), the volume of voluntary funds has remained very small. Although by December 1994 there were more than 800,000 voluntary accounts, the total voluntary funds accumulated in the system amounted to only 1.4% of total funds (Fuentes, 1995).

IV.2 Accumulated Funds, Investment Rules and Rates of Return

The volume of pension funds Privately managed by the AFPs has increased dramatically since 1981. As can be seen in table 3, between 1985 and 1995 they increased from 10% of GDP to almost 43% of GDP. Furthermore, recent simulations suggest that by year 2010 the accumulated funds will represent 110% of GDP, and that by 2020 they would have reached 134% of GDP (Fuentes, 1995).

From early on the authorities imposed a tight regulation on the type of assets the funds could invest in. This regulation has taken the form of maximum limits on holdings of a particular type of financial instrument. The rationale for these limits has been safety. Initially, and especially given the opposition to the reform by influential members of the armed forces, the economic authorities decided that it was essential that the funds were mostly invested in high grade securities. During the early years, funds were largely restricted to government securities -- with a limit of 100% of the fund --, bank deposits, investment grade corporate bonds and mortgage bonds. In 1985, AFPs were allowed to invest in equities. Although the limit on equities was theoretically set at 5% of the funds, strict restrictions on the type of issuing firm seriously limited the AFPs ability to invest in equities. In fact, during the second half of the 1980s most funds invested exclusively in equities of firms that were being privatized. As a result

of these restrictions, by the end of 1986 the AFPs had invested in only six stocks, representing less than 4% of the total fund.

By 1989, some of these restrictions were lifted, and most AFPs increased their equities positions significantly. At that time equities from 23 firms were being held by the AFPs, adding up to 11% of the aggregate funds. However, more that 90% of the AFPs equities portfolio was made up of only eight recently privatized firms. In 1989 AFPs were also allowed to invest in real estate, and in 1992 they were permitted to invest up to 9% of the fund in foreign securities. Surprisingly, perhaps, there has been a very limited interest in investing in foreign instruments. By December 1995 less than 1% of the accumulated funds had been invested abroad.

As can be seen in Table 4, rates of returns on the accumulated funds have been nothing short of spectacular. This has been largely the result of Chile's economic circumstances during this period. Between 1985 and 1995, Chile has experienced a tremendous growth period were the value of assets, and in particular firms, increased at a very fast rate. Additionally, between 1985 and 1991, real interest rates were very high, allowing funds that invested in fixed income securities to experience very healthy returns. A recent study on the sources of AFP's rates of return shows that the return on the stock of two electric utilities (Enersis and Endesa), explains almost 40% of the total return of the funds (Valck and Walker, 1995). It is highly likely that in the years to come both interest rates and stock market returns will move closer in line with international levels, affecting the rate of return of pension funds. In fact, during 1995 and 1996 the AFPs have experienced, on average, a negative real return

The Chilean system imposes lower limit to the return AFPs have to pay to their members. This minimum is either 50% of the average return across AFPs, or 2 percentage points below the

average -- whichever is higher. Those AFPs that do not obtain this minimum return from their portfolio, have to make up the difference from funds withdrawn from an "investment reserve" especially set up for this purpose. This "reserve" has to amount to, at least, 1% of the total value of the fund and is invested in a portfolio that exactly mimics that of the fund. If an AFP cannot meet a profitability shortfall out of its reserves, it is liquidated. The state makes up the difference between the actual and minimum guaranteed return, and contributors transfer their funds to another AFP.

There is also a maximum allowable return, determined as 50% or 2 percentage points over the average across AFPs. Those companies that exceed the maximum have to deposit the excess funds on a "profitability reserve", which is part of the fund's (and not the management company's) assets. If in a subsequent year the AFP's portfolio underperforms, this reserve can be used to make up the difference between the actual and minimum return.

The combination of the "one fund per AFP", and the minimum/maximum profitability rules has resulted in AFPs having extremely similar portfolios. In fact, as Table 4 shows, the dispersion in returns has been very small. Although this homogeneity of results may have some political appeal -- no group of participants will appear as being taken advantage of --, it introduces non-trivial economic distortions. In particular, and as will be discussed in greater detail below, it increases the administrative costs of running funds and does not allow people with different tolerances for risk to have different portfolios.

IV. 3 Administrative Costs and Concentration

A number of critics of the Chilean social security reform have argued that a privately run system based on free choice is exceedingly costly. In particular, it has been argued that a system

that allows -- in fact, encourages -- frequent transfers of funds across AFPs will tend to overspend in advertising and in sales. It has been proposed that a better solution would be either to have a public sector institution manage the retirement funds, and/or to restrict the participants' ability to transfer their funds across AFPs (Diamond, 1994; Mesa Lago, 1996).

Fees and commissions are determined freely by the AFPs. Currently they are allowed to charge the following fees:

- A proportional fee on contributions;
- a fee for opening a new account;
- a fee for managing programmed pension withdrawals;
- a fee for managing voluntary contributions;
- a flat fee per period when contributions are made.

In recent years, however, most AFPs have waived the flat fee (Vittas, 1996). In addition to these fees, AFPs were allowed, until 1987, to charge a management fee on every account , including those of inactive workers. On the other hand, and in order to encourage competition, AFPs are not allowed to charge an exit fee.

Initially administrative costs were extremely high. In 1984, for example, they amounted to 9% of wages, or 90% of contributions to the retirement system! By 1994, however, costs had declined significantly, amounting to 1% of wages or 10% of contributions. In spite of these high costs, the new capitalization system is significantly more efficient than the old pay-as-you-go regime. For example, Bustos (1995) has calculated that total costs of the new regime are 42% lower than average costs of the old system.

In terms of accumulated assets, administrative costs have declined from almost 15% in 1983 to 1.8% in 1993, including sales costs.[16] In spite of these relatively high administrative costs the net return to participants for the system as a whole exceeded 10% in real terms during the first 15 years of the system. Vittas (1995) has argued that although Chilean administrative costs as a percentage of assets are not very different from those of U.S. and U.K. insurance companies, they are significantly higher than the costs incurred by government-run provident funds in Singapore and Malaysia -- 0.1 to 0.2 percent of accumulated assets.

Marketing and sales costs represent an important percentage of total administrative costs. Valdés-Prieto (1994b), for example, has estimated that in 1991 marketing and sales costs exceeded one third of total costs. Margozzini (1995), on the other hand, has calculated that sales costs averaged 20 percent of total costs, with marketing costs representing an additional 3 percent. Moreover, there is evidence that in the last few years these costs have increased significantly. The total sales force for the system, for example, has increased from 3,500 in 1990 to almost 15,000 in early 1995. All in all, sales costs as percentage of total costs, have more than doubled between 1988 and 1995.

Some critics of the Chilean reform have argued that limiting the frequency with which participants can switch funds provides an efficient way of reducing administrative costs, and thus increasing the net return that accrues to contributors. However, since the costs of opening a new account represents a high percentage of the cost of transferring funds, a more effective solution -- and one that would maintain individual's choice -- would be to allow ALPS to manage more

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[16] On the cost structure of AFPs see, for example, Margozzini (1995).

than one retirement fund. In this way individuals could transfer their retirement savings to different funds, within the same AFP, at a reduced cost. Moreover, the elimination -- or, at least, modification -- of the minimum return requirement would increase the degree of competition among ALPS, and would allow individuals with different attitudes towards risk to choose the type of fund that better suits their preferences.

When the new retirement system was launched in 1981 there were 12 pension management firms. By 1995 the total number had increased to 21 ALPS. In spite of relatively free entry, the industry has a non trivial degree of concentration. In 1990-94, for example, 68% of all workers were affiliated to the three largest ALPS. The degree of concentration has declined considerably, however. According to a World Bank study, the Herfindahl concentration index fell from 2200 in 1981 to 1260 in 1994 (Vittas, 1995).

During the first fifteen years of operation of the new system, ALPS have been, on average, highly profitable. Their average (real) return on equity has averaged 16.6% over a decade and a half, and peaked in 1989-91 when it exceeded 35% per year. This high return, however, hides significant differences across ALPS. For example, in 1994, 11 out of 21 ALPS incurred in losses, which in some cases bordered 50% of equity.[17]

IV.4 Government Guarantees

Although the Chilean system is based on individually capitalized accounts managed by private firms, the government retains an important role that goes well beyond regulating and supervising the system. First, the government guarantees a minimum pension to poorer

[17] See Margozzini (1995) and Vittas (1995).

participants in the system. Those individuals that have contributed to the system for at least 20 years, and whose accumulated funds cannot cover a minimum pension, receive from the state a transfer that raises their pension to that minimum.

The value of the minimum pension is adjusted by inflation every time the accumulated change in the CPI reaches 15 percent. This means that at the current level of inflation, minimum pensions get adjusted once every two years. Minimum pensions are currently equal to 25 % of average wages, and 75% of the minimum wage. In the past they have been as low as 61% of minimum wages (in 1982) and as high as 91% of minimum wages (in 1987). The government also guarantees the minimum pension to those individuals that, having opted for a pension based on programmed withdrawals, outlive the program and exhaust their accumulated funds.

Second, and as explained in the preceding subsection, the government guarantees a minimum return on accumulated funds. If an AFP under performs significantly, and the funds in its reserves accounts -- both the investment and profitability reserves -- are insufficient to bring the actual return to the minimum level, the government covers the difference. As pointed out, in this case the AFP is liquidated and the participants transfer their funds to another institution. And third, the government also guarantee pension payments (up to a limit) in case an insurance company goes bankrupt.

In addition to its involvement in these areas, the Chilean government also makes pension payments to those individuals that, either by choice or because of their age, did not transfer to the new system. As is discussed in detail below, the cost of paying these pensions has been significant exceeding, in some years, 4% of GDP.

From a policy point of view, the involvement of the government in providing and guaranteeing pensions means that, contrary to what has often been argued, the Chilean system relies on the "three pillars" recommended by the World Bank in its report ***Averting the Old Age Crisis*** (1994). There are, however, two main main differences between the Chilean system and those in operation (or contemplated) in other countries:

- In Chile, the "public pillar" plays the role of a provider of last resort,
- In Chile, the obligatory capitalization pillar is privately managed.

The government guarantees described above introduce a minimum sense of "solidarity" into the system. They do this, however, at the cost of introducing significant elements of moral hazard. In particular, there is an incentive for (lower income) individuals to minimize their contributions and to obtain the minimum pension. An easy way to reduce this problem would be to establish some relationship between the guaranteed pension level and the years of contributions. This means that instead of a single minimum guaranteed minimum pension, there would be a guaranteed pension "band", where those with, say, 20 years of contributions would be at the bottom of the band, while those with 30 or more years of contributions would be at a higher level in the band.

V. Pensions Under the New System

One of the objectives of the Chilean pension reform was to increase the real value of pension, especially for the poorer groups in the country.[18] In the traditional system retirement requirements and the level of pensions were determined in a discretionary fashion and, largely,

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[18] See Piñera (1988).

responded to political influence. Under the new system the value of pensions depends on the amount of funds accumulated. The new system established a retirement age of 65 years old for men and of 60 years old for women. As I discuss below, there is, however, the possibility of early retirement. When an individual retires he can choose between two systems:

- he can use the accumulated funds to buy an annuity from an insurance company; or,
- he can chose to enrol in a "programmed withdrawal" scheme, where the accumulated funs are drawn according to an actuarially determined schedule.

Both of these options have advantages and disadvantages. Under the programmed withdrawal alternative, any balance left when the contributor dies is inherited by his heirs. Also, under this program retirees can continue to transfer their balance across ALPS, thus taking advantage of perceived (and expected) differentials in rates of return. Additionally, if the individual outlives the program and the fund is used up, the retiree gets the minimum pension for the rest of this life. Annuities, on the other hand, assure the retiree a steady and known income stream for the rest of his life. In the case of annuities, however, there are no inheritance provisions, and fees have tended to be somewhat high.

Recent data based on a sample of 4,064 individuals that have retired under the new system suggest that the average replacement rate has amounted to 78% (Baeza and Burger, 1995)[19]. Interestingly enough, the highest (relative) pensions have been obtained by those individuals that have opted for early retirement, with a replacement rate of 82% under

[19] These authors calculated the replacement rate on the bases of average real salary in the 120 months preceding retirement.

programmed retirement. Baeza and Burger (1995) attribute this result to the fact that only those that have had rapid accumulation of funds -- mostly by making voluntary contributions -- can in reality opt for early retirement. Disability pensions -- which, as explained earlier, are financed with a 3% of wages insurance premium -- have also had high replacement rates, reaching 67%. Finally, survivor's benefits have reached a 71% replacement rate. These replacement rates are significantly higher than the average for the old system -- only 50% in 1980.

The system also allows for early retirement. However, this only becomes an option once the fund is high enough as to produce a pension that covers at least 70% of the contributor's current salary. Those opting for early retirement can also choose between programmed withdrawals and annuities. By 1994 there were already 200,000 retirees receiving pensions under the new system. Of these, approximately one half had opted for annuities, and one half for programmed withdrawal.

There is also the possibility of lump sum withdrawals. To qualify for this option two requirements have to be met: (a) The pension has to have a replacement rate of at least 70%; and (b) the pension has to be at least equal to 120% of the minimum pension. Although there are no exact figures on the percentage of individuals that have opted for lump sum payments, Baeza and Burger (1985) found out that 24% of the contributors in their sample had taken advantage of this option. They calculated that when these payments are taken into account the effective rate of replacement of the new system increases to 84%.

The coexistence of old- and new-system retirees allows for a direct comparison of pensions under the pay-as-you-go and capitalization systems. To December of 1994 average old age pensions under the capitalization system were 42% higher than those under the pay-as-you-

go regime. In the case of disability, pensions under the new system were 61% higher than under the old one.

Naturally, given the nature of Chile's capitalization system it is not possible to know exactly how future pensions will compare with those currently being paid. One can expect, however, two forces that will operate in opposite directions in the future. On the one hand, a lower rate of return on the funds will reduce pension payments. On the other hand, if the steady state rate of return is higher than 4% -- the return of the recognition bond, which represented a large percentage of the current retirees fund -- we could expect a positive effect on pensions paid in the future.

The actual rate of replacement has differed slightly between annuities and programmed withdrawals. Baeza and Burger (1995) found out that for early retirement the annuities scheme resulted in a replacement rate of 78%, while programmed withdrawal resulted in a replacement rate of 83%. For standard old age pensions, however, annuities yielded a replacement rate of 74 percent, while programmed withdrawal resulted in a replacement rate of 83%.

An important (indirect) effect of the reform is that it has encouraged the development of an active annuities market. Largely as a result of the pension reform, insurance companies assets as percentage of GDP have increased by more than four times between 1985 and 1995. Annuities, however, are currently very expensive, costing almost 4% of the value of the contract. This aspect of the system has generated important criticisms, including calls for allowing for group purchases of annuities and for a greater regulation of the industry, as a way of reducing their cost.

VI. Transitional Issues

Dealing with the transition is one of the key policy questions in designing a pension reform program that replaces a pay-as-you go system with a capitalization one. The transition poses three basic problems:

- determining the transfer rule for workers. Which workers will join the new system, and which ones will stay with the old one? Will workers have choice?
- devising a method for crediting funds to those workers that transfer to the new system, but have already made contributions to the old system.
- financing pension payments to old-system retirees. Once contributions from active workers are pulled out of the old system and channeled to the individual capitalization accounts the old system becomes completely unfunded.

The new Chilean pension law established (Title XV, article 1) that workers that joined the labor force before December 31st, 1982 had five years to decide whether to join the new system. Those joining the labor force after that date could not participate in the old system, and had to become affiliated with an AFP of their choice. Since those that joined an AFP experienced an immediate increase in net take-home pay of 11%, the number of people transferring to the new regime was very high. By the end of 1982 more than a million workers, representing 36% of total employment, had already transferred to the new system.

The government dealt with past contributions of transferees by issuing bonds that were deposited in their individual AFP accounts. The rationale for this was to "recognize" past contributions -- therefore the bonds became known as *recognition bonds* --, and to provide the

bases for the new retirement fund. These bonds yielded a 4% return in real terms, significantly below the ex post market return and, until 1995 could not be traded in the secondary market.

In order to be eligible for receiving a recognition bond the individual must have made at least 12 monthly contributions into the old system during the previous 5 years. The actual value of the recognition bond was calculated by using a rather complicated formula, consisting of the following steps:

- The average annual base wage used to determine contributions made to the old system prior to June 30 1979, was multiplied by 0.8;
- This number was then multiplied by the ratio of total years of contributions to 35 (35 years being the assumed number of working years for obtaining a "normal" pension);
- The resulting number was multiplied by 10.35 for males and by 11.36 for females.
- The number resulting from this calculation was then multiplied by a factor that varied according to the individual's age and gender. For the case of males the factor varied between 1 and 1.11, and for the case of females it varied between 1 and 1.31.

At this point it is illustrative to make some actual calculation using this formula. Assume first the case of a 35 years old male whose average pensionable salary was US$ 6,000 per year, and who had been contributing to the old system for 15 years. In this case the value of the recognition bond to be deposited in his new AFP account would be US$ 20,292.[20] Consider now

[20] Strictly speaking this is only an approximation, since the recognition bond was expressed in UFs, the Chilean indexed unit of account.

the case of a 45 year old female, with an average pensionable salary of US$ 6,000 and 25 years of contributions. Her recognition bond would amount to US$ 40,896. Recognition bonds yield 4% in real terms and can be redeemed when the individual retires, dies or becomes disabled. In the case of our hypothetical male worker, at age 65 the value of the recognition bond would be US$ 70,000; for our female participant the recognition bond would have a value at retirement -- recall that women retire at 60 years old -- of almost US$ 74,000. An interesting calculation refers to the hypothetical value of the recognition bond for a 65 years old individual who has contributed for 35 years to the old system. In a way this number would reflect the authorities' implicit valuation of a life time of contributions to the system. In the case of a male worker this life-time hypothetical recognition bond would be 9.198 times his average annual base salary. In the case of a woman the hypothetical value of the life-time recognition bond would be 11.905 times the base salary if she had worked 35 years, and 10.205 times if she had worked for 30 years -- recall, once again, that women retire at age 60.

From a fiscal point of view the reform generated two major sources of public expenditures: (a) the servicing and payment of the recognition bonds; and (b) the payment of retirees in the old system. Table 5 contains data on the fiscal costs of the transition. The first column contains information on the deficit (as percentage of GDP) stemming from the government's obligations towards "old" retirees. These include both those already retired when the reform was enacted, as well as those that choose not to switch to the new system. Since most of the "cash" costs are related to pensions due to people that had already retired in 1981, these costs peaked on rather early (in 1983) when they represented 4.58% of GDP. In fact, given life expectancy in Chile, these costs start declining rather rapidly after 1995. The second column in

table 5 presents data on the cost of servicing and paying the recognition bonds -- for details on the recognition bonds see Section VI below -- which were deposited on active workers' retirement accounts. The time path of the recognition bonds' costs are explained by the country's demographics. The pattern of projected retirements is such that value of maturing bonds peaks in 2005.

Chile has opted to directly finance these costs out of general government revenues. In fact, one of the most attractive features of the Chilean reform is that it made the costs of old age security very transparent. The government had to recognize sizable unfunded liabilities, and provide for their payment. Some authors have argued that since these costs are, indeed, quite large, Chilean style reforms are not replicable in other countries (Mesa Lago 1996). This, however, is not clear a priori and will depend on a number of economic, financial and especially political factors. At the end of the road, the question is one of cost and benefits. Is it worthwhile maintaining a compulsory, and in most cases largely inefficient, government-run pay-as-you-go system along side a privately managed one, in order to avoid the fiscal costs of the transition?[21]

VII. Effects on Capital Markets, Savings and Labor Markets

The Chilean pension reform has had important effects on the overall functioning of the economy. Perhaps one of the most important effect is that it has contributed to the phenomenal increase in the country's savings rate, from less than 10% in 1986 to almost 29% in 1996. This effect has taken place mostly through an increase in public sector savings -- public savings have

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[21] This is the avenue chosen by some Latin American countries, such as Argentina.

increased from close to 0.1% of GDP in 1983 to more than 5% of GDP by 1993. A number of researchers have established that increasing public sector savings represents the most effective way of increasing aggregate savings. In general, higher public savings unleash a virtuous circle, where higher savings generate higher growth, and higher growth (in turn) results in higher private savings (Edwards, 1996). Whether the Chilean reform has actually increased private savings directly, is still somewhat of an open question. Although cross country regression analyses suggest that pension reform affects private savings, there still are no definitive studies on the Chilean case.[22] Haindl (1996), however, has recently attempted to estimate econometrically the effects of the reform on private sector savings. Using an approach based on the inclusion of a series of dummy variables in a time series analysis of the determinants of savings he concludes that the reform indeed contributed to the increase in savings.[23] In a more ambitious attempt, Morande (1996) uses modern time series analysis to estimate an error correction model of savings for Chile. He concludes that there is preliminary evidence supporting the notion that the reform of the pension system encouraged private sector savings. Finally, Bosworth and Marfan (1994) have argued that the contribution of the pension reform to the increase in savings bordered 3% of GDP.

Pension funds are the largest institutional investors in the Chilean capital market, with assets exceeding 40% of GDP, as compared to a 0.9% in 1981. The asset composition of pension

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[22] On cross country studies on savings and social security see, for example, Feldstein (1970) and Edwards (1996).

[23] Haindl's (1996) analysis, however, is subject to a number of shortcomings, including the presence of a serious simultaneity bias

funds is described in table 6. As discussed above, the performance of AFP portfolios has been impressive in terms of real rates of return, and as shown in table 7, the returns to individual pension accounts have been higher (on average) than for the financial system as a whole. The massive amount of funds that AFP control has helped create a dynamic and modern capital market. What is perhaps more important, however, is that it has allowed private firms to rely on long term financing for their investment projects. This has been particularly important for the privatized utilities. Moreover, Chile's new and ambitious (privately funded) infrastructure program will only be possible if there is long term financing available, of the type the AFPs are able of providing.

The pension reform has also had an important effect on the functioning of the labor market. First, by reducing the total rate of payroll taxes it has reduced the cost of labor and, thus, has encouraged employment creation. Second, by relying on a capitalization system, it has reduced greatly -- if not eliminated -- the labor tax component of the retirement system. Currently (most) workers see their contributions as a deferred compensation, rather than as a tax. A key question, however, is whether there is still an element of taxation involved in the system. This will depend on a number of factors, including the rate of return on the funds, the perceived future pension income, the magnitude of management fees, the degree of risk aversion and the rate of discount of workers. Diamond and Valdés-Prieto (1994) have argued that, although it is likely that the new system still retains some implicit tax, this is substantially lower than in the old system.[24] Cox -Edwards (1992) has also argued that the Chilean pension reform system has

[24] A modern and well functioning labor market has been an important element of Chile's economic success. It has allowed for rapid job creation, and has resulted in the reduction of a

resulted in a significant reduction in effective taxes on labor. She has argued that this has contributed to the surge in employment creation in Chile, as well as to the rapid increase in (average) real wages since 1985.

VIII. Concluding Remarks

The Chilean pension reform program has been a pionner in the world. It has successfully replaced an inefficient, unfair, insolvent pay-as-you go system with a (reasonably) well functioning privately managed system. Up to now the rates of return of the new system, as well as the pensions being paid out have been very high. This trend, however, is likely to change in the years to come, as Chile's rates of return begin to converge towards world levels. In fact, during the last 18 months (1995 and the first half of 1996) the system as a whole has experienced negative returns. An interesting issue is how will the system react to this new state of affairs. The most likely scenario, in my opinion, is one where some of the current shortcomings of the system -- including the limitation for multiple funds, and the distortionary incentives generated by the government -- will be addressed by the authorities. It is not unlikely, then, that the Chilean system will continue to evolve providing new a fresh lessons in the future.

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rate of unemployment that boarded 25% to one below 6% of the labor force.

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Table 1.

Chile's Structural Reforms: An Overview

Item	Description
Trade Liberalization	Major unilateral opening during 1975-9. All quantitative restrictions eliminated; uniform import tariff of 10% established. Temporary hike in tariffs in mid-1980s; since 1987, uniform import tariff of 11%.
Privatization	Two rounds of privatization: 1974-9 and 1984-9. During first round, banks were privatized first, followed by manufacturing firms. First round ended in crisis in 1982 with a number of major banks being nationalized. During second round, efforts made to establish regulatory framework before firms and banks were sold. By 1994, approximately 96% of state-owned enterprises had been privatized. Some major firms, including the giant copper producer, CODELCO, remains under government control.
Fiscal Reform	Major tax reform in 1975. Value added tax introduced. Personal and corporate income taxes consolidated. Significant improvement in administrative capacity. Fiscal accounts balanced since 1977. Tax rates revised in mid-1980s in order to encourage savings.
Financial Reform	Sweeping reform was begun in 1975 with privatization of banks. Interest rate controls and forced credit allocation were eliminated. Reserve requirements were drastically reduced and entry into banking sector was encouraged. Securities markets received a major boost as a result of social security reform. Supervisory framework weak until mid-1980s; significantly strengthened since then.
Social Security	Insolvent pay-as-you-go system replaced by individually capitalized system run by private administrators. Health system transformed into a two-tier system: a basic one for lower income people and an insurance-based system for most workers.

Table 2.
Chile: Key Legal Requirements for AFPs

I. Initiating Operations

A. Authorization by the Superintendency of Pension Fund Managing Entities (AFP in the Spanish acronym)
B. Minimum capital requirement: UF 5,000 (approx. US$ 160,000)

II. Mandates

A. Manage one Pension Fund
B. Provide and administer only the benefits permitted by law

III. Minimum Capital and Reserve Requirements

A. Minimum capital requirements grow with the number of affiliates:

	# of affiliates:
UF 10,000	5,000-7,499
UF 15,000	7,500-9,000
UF 20,000	10,000 or more

B. Reserve Requirement: 1% of value of Pension Fund
C. Minimum Revenue Rate:

1. The average, annual real revenue rate of all Pension Funds minus 2 percentage points, or (whichever is less)
2. 50% of the average, annual real revenue rate.

IV. Permitted Investments

A. In Firms Shares (Stocks):

1. Permitted in 1985, up to 5% of Pension Fund assets or of a firm's total shares, whichever was less.
2. Since 1989, limit expanded to up to 7% of Pension Fund assets, and maximum ownership of 1% of a firm's shares.

B. In Foreign Instrument:

1. Permitted since 1990, but guidelines issued in mid-1992.
2. Permitted to invest a small percentage of total assets in low-risk, fixed return instruments issued by foreign banks or governments.

Table 3.

Chile:
Evolution of the Pension Funds

Year	US$ Millions[a]	% of GDP	Funds Growth Rate, %
1981	276.43	0.86	
1982	871.00	3.36	215.12
1983	1,582.14	5.97	81.62
1984	2,062.68	7.88	30.38
1985	2,881.54	10.22	39.69
1986	3,775.84	12.48	31.04
1987	4,625.50	14.49	22.49
1988	5,640.05	15.39	21.94
1989	6,970.49	18.46	23.59
1990	9,243.57	24.73	32.61
1991	13,082.19	32.17	41.53
1992	14,587.29	32.24	11.50
1993	18,744.30	39.39	28.50
1994	22,663.69	41.18	20.91
March 1995	22,076.19		-2.59

[a] March 1995 dollars.

Source: Bustamante Jeraldo (1995).

Table 4.

Chile:
Annual Real Rates of Return of the Pension Fund System[a]
(percentages)

Year	Weighted Avg.[b]	Range	Median
1982	28.8	23.2 - 30.2	27.6
1983	21.2	18.5 - 24.7	20.8
1984	3.6	2.2 - 5.1	3.5
1985	13.4	13.0 - 14.3	13.4
1986	12.3	10.6 - 15.5	12.4
1987	5.4	4.8 - 8.5	5.4
1988	6.5	5.9 - 8.7	7.1
1989	6.9	4.0 - 9.5	7.9
1990	15.6	13.3 - 19.4	17.0
1991	29.7	25.8 - 34.3	30.8
1992	3.0	0.9 - 4.2	3.0
1993	16.2	14.6 - 16.9	16.1
1994	18.2	15.7 - 21.1	18.2
[c]1995	(4.7)	(6.6) - (3.5)	(4.8)

[a] Annual nominal change deflated by the indexed unit (UF) variation of the period.
[b] Weighted by the value of each AFP's assets.
[c] From December 1994 to November 1995.

Source: Banco Central de Chile, Boletín Mensual, various issues.

Table 5.

Chile:
Fiscal Impact of Social Security Reform; Its Effect on the Deficit of the Old System (percentage of GDP)

Year	Cash Deficit	Recognition Bonds	Total
1981	1.47	0.01	1.48
1982	4.08	0.11	4.19
1983	4.58	0.22	4.80
1984	4.55	0.25	4.80
1985	4.27	0.30	4.57
1986	4.33	0.41	4.74
1987	4.35	0.49	4.84
1988	4.23	0.50	4.73
1995	3.10	0.80	3.91
2000	2.57	0.94	3.51
2005	1.84	0.99	2.83
2010	1.19	0.80	1.99
2015	0.80	0.40	1.20

Sources: Ortúzar (1988) and IMF estimates.

Table 6.

Chile:
Pension Fund Assets per Financial Instruments
(percentages, as of December of each year)

Year	Securities	Time Deposits, Financial Institutions	Credit Notes, Financial Institutions	Corporate Bonds	Firms Shares	Investment Funds	Foreign Instruments[a]
1981	38.1	61.9	9.4	0.6	0.0	0.0	0.0
1982	26.0	26.6	46.8	0.6	0.0	0.0	0.0
1983	44.5	2.7	50.7	2.2	0.0	0.0	0.0
1984	42.1	13.3	42.9	1.8	0.0	0.0	0.0
1985	42.4	21.3	35.2	1.1	0.0	0.0	0.0
1986	46.6	23.3	25.5	0.8	3.8	0.0	0.0
1987	41.4	28.5	21.3	2.6	6.2	0.0	0.0
1988	35.4	29.5	20.6	6.4	8.1	0.0	0.0
1989	41.6	21.5	17.7	9.1	10.1	0.0	0.0
1990	44.1	17.5	16.1	11.1	11.3	0.0	0.0
1991	38.3	13.3	13.4	11.1	23.8	0.0	0.0
1992	40.9	11.1	14.2	9.6	24.0	0.2	0.0
1993	39.3	7.6	13.1	7.3	31.8	0.3	0.6
1994	39.7	6.3	13.7	6.3	32.2	0.9	0.9
[b]1995	40.7	6.0	16.0		[c]36.9	[d]0.4	

[a] As of May 1993, AFPs began to invest in foreign instruments.
[b] November 1995.
[c] Corporate bonds + firns shares.
[d] Investment funds + foreign instruments.

Source: Valck and Walker (1995) and Banco Central de Chile, Boletín Mensual, January 1996.

Table 7.

Chile:
Annual Real Rates of Return on the Financial System and on Individual Pension Accounts, 1981-1990
(percentages)

Year	Financial System	Returns to Pension Account[a]
1981	13.2	5.3
1982	12.1	25.5
1983	7.8	19.4
1984	8.4	2.4
1985	8.2	11.6
1986	4.1	10.9
1987	4.3	4.5
1988	4.6	6.1
1989	6.8	6.7
1990	9.4	15.7
Average 1981-1990	7.8	10.4

[a] For the average assessable income. These returns are lower than the average for the AFPs (reported in table 1) due to the existence of commissions or fees paid by asset holders.

Source: IMF, based on data provided by Chilean authorities.