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Social Security Reforms in Chile

**Peter Diamond
Salvador Valdés**

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SOCIAL SECURITY REFORMS IN CHILE

Peter Diamond*
Salvador Valdés Prieto**

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* Massachusetts Institute of Technology.

** Instituto de Economía, Pontificia Universidad Católica.
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INTRODUCTION

The Chilean privatization of social security has received a great deal of attention from countries contemplating a similar reform and international institutions that advise and lend to third world countries. This privatization has dramatically altered the politics of the provision of earnings-related retirement income, insulating this institution from the political process. It is worth noting that in Chile, private providers have been closely regulated; there has not been reliance on unregulated market forces. A second gain from privatization is that it has contributed enormously to the development of capital markets in Chile. Offsetting these gains, there is one cost. Privatized annuities appear to be noticeably more expensive in administrative costs than a more traditional defined benefit social security system.

There are three specific aspects of the reform as it has been carried out in Chile that are important for reformers elsewhere to recognize. One is that Chile chose to retire the pension debt associated to the preexisting pension system, which requires a large primary fiscal surplus for forty or more years. This surplus has been used to finance the pensions of the old pension system and the promises associated with the transition. This fiscal sacrifice has allowed the flow of payroll tax revenue into privatized mandatory savings accounts to be genuine new saving, available to finance investments by the private sector and some debt issues by the government. This fiscal effort can be avoided, but then there is no gain regarding increased national saving.

Second is the fact that in Chile the conversion of accumulated wealth to annuities occurs at one age only (retirement). This choice implies that there are missing insurance markets relative to earlier time frames, and that workers are exposed to the risk that their funds have low value just when they are selling to purchase an annuity. Third, as annuities are not mandatory in Chile adverse selection problems are bound to arise.

These issues raise three questions. One question is which countries will find the benefits of similar reforms outweighing the costs. Second, for a country with an existing pay-as-you-go system that wishes to proceed with precisely the Chilean reform, there is the question of the timing of such a reform (relative to the fiscal soundness of the general budget). The third question is the possibility of alternative institutional designs that might have lower administrative costs and generate an annuities market that functioned better than in Chile.

We start this paper (Section 1) with a brief overview of the Chilean reform. In Part 2 we turn to a more detailed description and analysis of the current institutions and the history of social security in Chile. In Part 3 we describe the reform of 1980 and the transition. In Part 4, we analyze the new system, considering, in turn, the market for intermediaries who accumulate the mandatory savings, the provision of disability and survivors insurance, and the market for annuities. We then turn to the economic implications of this structure and the political economy associated with privatized social security.

In Part 5, we draw some implications of our analysis, dividing the implications into those relevant for a country trying to decide whether to exactly imitate Chile, those relevant for a country considering modest modifications in what has been done in Chile - which may be useful in Chile -, and those relevant for a country considering a Chilean-style reform but with a wider choice of institutional structures. We also contrast this system with a conventional government system built around a retirement benefit formula.

1. OVERVIEW

Chile began its social insurance system in 1924. By the 1970's it had developed a pattern that is not uncommon in many countries. There were separate defined benefit systems for different industries and occupations. These were not unified so that benefit structure and levels were different in different sectors. Having multiple bureaucracies was inefficient. The political determination of benefit levels had resulted in very high contribution rates, which (including health) were in the range 51-59% in 1975. Government financial support to health, pensions, plus contributions for government employees cost 20.5% of total government expenditure. A major problem was the political tendency to raise benefit promises when short run financing was available because of immaturity of different systems. There was little reason to think that the complementary problem of the vulnerability of benefit levels to short run fiscal difficulties would not be serious. That is, pensions were excessively dependent on the state of public finance relative to a reasonable standard. In light of these problems, planning on social security reform was begun in the 1970's under the Pinochet government; and after a significant fiscal surplus had been built, implementation began in 1981.

The heart of the reform is a privatized mandatory savings plan, together with a market for indexed annuities for conversion of accumulations into retirement income streams. All covered or "dependent" workers must place 10% of monthly earnings in a savings account with an approved (regulated) intermediary, an Administradora de Fondos de Pensiones, referred to as an AFP. The complete return on the fund allocated to the individual accounts. The AFP also provides survivors and disability insurance. Workers must pay a commission charge to the AFP, in addition to the 10%, to finance insurance and to cover costs and profits. Workers are free to select any AFP and to switch.

On becoming eligible to receive pension benefits the worker can choose between a sequence of phased withdrawals or an annuity. In Chile, this second option involves a switch of financial intermediary, as the annuity must be purchased from an insurance company. In addition, there is a sizable guaranteed minimum pension. The fact that Chile has a long history of using indexed debt has made it easy for the annuity option to be restricted to indexed annuities.

There are four visible effects of the reform that are important - effects on worker confidence in future pension provision, on capital accumulation and investment in the private

economy, on the level of administrative costs associated with the provision of pensions, and on the government budget.

By the late 1970's, workers had little confidence that the social security institutions would provide them with significant pensions in the future. Thus there was limited opposition to the reform from workers. Having individual privatized accounts gave the workers some confidence about future benefit receipts. When the new democratic government chose to keep the pension reform, this confidence increased.

The combination of a steady flow of contributions together with very high real rates of return (an average of 14.5% from July, 1981 to July, 1992.FN1 Also, the internal rate of return on real annuities issued in 1991 averaged 5.0%./) has meant a large accumulation of funds invested in the Chilean economy. As of June, 1992, the total accumulations were US\$12.44 billion, equal to 35% of 1992 GDP; equity holdings by pension funds were 9.6% of the value of the Santiago Stock Exchange (with life insurance companies holding another 1%); and 61.1% of registered corporate bond issues outstanding were held by pension funds, with life insurance companies holding close to an additional 30%. Together with this growth has been an evolution of regulation of the markets in which these funds are invested, resulting in a set of capital markets that function far better than they did before the reform. At present, close to 40% of the assets of pension funds are in public debt.

Administrative costs of the new system include both those of the AFP's that manage mandatory accumulation and those of the insurance companies that produce disability insurance, life insurance, and annuities. We present estimates that the average administrative charges per effective affiliate while active include: (i) 51.6 US\$/year for collection, account management and fund management; (ii) 30.8 US\$/year for annuities; and (iii) 6.7 US\$/year for invalidity and survivors insurance. The total is 89.1 US\$/year (for 1991). This is not far from costs observed in other privately-managed pension systems, such as defined-benefit private pensions in the United States, where reported average costs per active worker are US\$ 187.3 per year. Chilean costs compare unfavorably with reported administrative costs in the well-run unified government managed systems for which there is appropriate information. For example, for services while working, the Employees' Provident Fund in Malaysia costs US\$ 10/year on the same basis as the 51.6 US\$/year reported above. As a share of covered earnings, the cost figures are 0.32% and 1.70% for Malaysia and Chile. We are not aware of a suitable figure for the U.S. for services while working, because the IRS charges only a small sum to the Social Security Administration for collection¹. In the annuity portion of costs, the SSA of the United States, which appears to be the cheapest, produces them at a cost estimated at US\$ 15.1/year on the same basis as the 30.6 US\$/year reported above. As a share of covered earnings, these cost figures are 0.08% and 1.01% for the SSA in the U.S. and Chile.

¹We thank Olivia Mitchell and Annika Sunden for this information.

Chilean costs are close to those of very expensive government-managed systems. For example, the Zambia Provident Fund costs 46.8 US\$/year, to be compared with the US\$ 51.6/year for Chile. As a share of covered earnings, these cost figures are 2.34% and 1.70% for Zambia and Chile. At the same time, Chilean costs are close to those of privately-run systems. For example, reported administrative costs per worker in occupational pension plans in the United States, of the defined-contribution variety, are US\$ 46.7/year.

Mandatory savings flow into new individual accounts rather than to pay pensions owed by the existing, mature, old social insurance system. With the Chilean decision to unwind outstanding pension debt, there has been little issue of new (explicit) public debt to finance the deficit in the old system. This financing decision has implied an (unreported) increase in fiscal saving over the business cycle, which has been used to cover pension commitments under the old system. This is reinforced by the acknowledgement of the pension debt owed to active workers who switched to the new system, on account of past contributions. The decision to avoid debt financing has meant that the government chose to improve the primary fiscal balance 3.5 - 4% of GDP each year in the 1980's. It is anticipated that the level of fiscal saving will remain about this level for another decade, with a gradual decrease thereafter. Before the start of the pension reform, the government built a primary surplus of 5.5% of GDP with a view to avoid debt financing of the reform. Thus, most of the measured transition deficit - the deficit in the old pension system - was financed out of a primary surplus (which varied with the state of the economy). Over the business cycle, minor portions of this deficit were financed by the issue of debt, and by the sale of shares in formerly state-owned utilities, with pension funds purchasing some of these shares.

2. OVERALL DESCRIPTION OF THE CHILEAN PENSION SYSTEM

This section includes a description of current institutions (2.1), a short history of social insurance in Chile (2.2) and a description of the 1980 reform and its transition rules (2.3).

2.1. Current institutions: Income redistribution, social insurance and voluntary saving and insurance.

The centerpiece of attention of the Chilean social security reform is the privatized mandatory savings system. In order to understand the workings of this system, it must be seen in context as well as examined in detail. There are two aspects of the context that seem to us to be important. One is the institutions to redistribute income to poor elderly (since the mandatory savings program itself has no intended redistribution). The second refers to private savings outside the mandatory system.

2.1.A Assistance Pension

The Chilean government has in place two programs that redistribute income explicitly towards the old, which are the Assistance Pension and the Minimum Pension, and we describe them first.

The Assistance Pension was created in 1961. Since 1975, a flat Assistance Pension has been paid to individuals over age 65 and to the disabled over age 18 who meet two tests. One is that they do not receive another pension and the second is a needs test based on an interview at home with a social worker from their municipality (with a reinterview required after three years). In 1987, 9.8% of all residents above 65 years of age received this pension. Although in theory the assistance pension is lost if a worker receives one peso per month in pensions from the earnings-related pensions, it is not known whether this condition is enforced.

In a survey conducted in 1987 it was found that 65% of recipients of the Assistance Pension were women, 82% of recipients had never contributed to any pension system and the rest did not meet the minimum requirement regarding the number of years of contribution of the pension system to which they had contributed. According to the CASEN 87 survey, the receipts from the expenditure of this program was divided among income classes as follows: lowest decile 35.2%; lowest quintile 50.4%; lowest 40%: 73.8% (Haindl, Budinich and Irarrázabal, 1989, pages 71 and 75)².

The recent history of the assistance pensions is summarized in Table 1. It is small relative to the average earnings of people covered by the mandatory savings pillar (earnings-

²Haindl, E. , E. Budinich and I. Irarrázabal, Gasto social efectivo: un instrumento que asegura la superación definitiva de la pobreza crítica , pages 71 and 75.

related pension). The assistance pension is entirely financed from general revenue. The administrative cost of assessment is paid by the municipalities and the cost of delivery is paid by INP, a government agency. The amount of this pension is fixed in nominal terms without automatic adjustment for inflation. In 1987-1989 a policy of reducing the real value of the assistance pension was pursued, by neglecting adjustments for inflation. In June 1990, this policy was reversed and the assistance pension was raised 82% in nominal terms.

2.1.B. Minimum Pension

A minimum pension has been paid since 1952 to those who have contributed to the pension system. This practice was continued in the reform that created the new pension system. It cannot be claimed together with the assistance pension. The minimum pension is considerably more generous than the assistance pension. For example, the level observed in June 1992 was 25.2% of the average taxable income after contributions for that month, considerably higher than the amounts shown in Table 1.

Although minimum pensions exist both in the continuing old earnings-related pension system and in the new AFP system, we will consider only the latter. The minimum pension covers old-age, disability and survivorship. For old-age, it is paid to men over 65 and to women over 60, if the pensioner has completed at least 20 years of contributions and does not receive other income that totals an amount above the minimum pension. The disabled are also eligible for the minimum pension provided they have at least ten years of contributions, or two years of contributions out of the last five years. In the case of disability caused by an accident, contributions are needed up to the date of the accident.

A minimum pension is also available for widows (but not widowers) and for surviving children under age 18. The rules for eligibility of the family are the same as those for eligibility for and disability pension. The means test also applies to these pensions. Up to now there has been no administrative implementation of this means test with regard to income sources different from mandatory earnings-related pensions. The minimum pension for a surviving widow is 60% of the standard amount, and for each child under 18, of 15% of the standard amount (Torche and Wagner, 1992)³.

In the new system, the minimum pension is financed out of general revenue. The Treasury pays for the minimum pension only after the funds in the individual account have been exhausted. Thus, the financing is "pay-as-you-go," with no accumulation put aside for future obligations. The present value of outstanding commitments to pay minimum pensions is substantial. In the tradition of conventional pension systems, the commitment to pay the minimum pension is not contractual, but legislated. Because it is defined in nominal terms and adjustment for inflation requires specific legislation, the real value of the minimum pension varies.

³Torche, A. and G. Wagner, "La seguridad social en Chile: inventario de programas", Working Paper N° 142 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, 1992), page 26.

Wagner (1991) has estimated the fiscal cost of the minimum pension in the AFP system using a microeconomic simulation model for a steady-state in terms of demographics and maturity of the pension system, but with the same per-capita capital stock and education levels present in the late 1980's⁴. In the simulation, the level of the minimum pension is set at the historical average for the last 35 years in real terms. The results of the simulation are shown in Table 2. Since the Minimum Pension tops up the earnings-related pension, its cost is sensitive to the level of earnings-related pensions, and so to the real rate of return.

The fiscal cost of the minimum pension is low in Chile, relative to that observed in Australia (4% of GDP) and New Zealand (8% of GDP), which have minimum pensions at a similar level in relation to average wages. The small fiscal cost can be attributed to the presence of mandatory contributions, which allows significant targeting of the subsidy.

Wagner's study also projects that the proportion of each cohort receiving the minimum pension will vary between 10.7% and 33.7%, according to the assumed real rate of return. The number of minimum pensions is large because the minimum pension is a high proportion of the average reported taxable income, and many workers spend only part of their careers in covered employment. The uncovered sector is large and there is a high degree of movement between covered and uncovered sectors.

That is why Chilean statistics report both "affiliates" - those that have contributed at least once in their lifetime-, and "contributors" - those that contributed last month-. The large volume of rotation in the Chilean labor market can be gleaned from the following facts: (a) in June 1992, 40.5% of the affiliates did not contribute in the previous month; (b) as of June 1992, 74% of the affiliates registered at least one contribution in the previous twelve months so on international definitions they were "covered"; and (c) as of June 1992, 77-80% of those gainfully employed contributed to either the new or the old earnings-related government-sponsored pension system for at least one month out of the previous twelve (INE, Boletín SAFP, Chamorro, 1992, p. 74).

2.1.C. Mandatory Savings through AFP's

Mandatory savings through AFPs are meant to be "nonredistributive". We put nonredistributive in quotation marks since a mandatory system will typically affect the distribution of utilities in ways that depend on the regulations affecting the mandatory system, as discussed in 4.5.

Each month, every covered worker is required to pay 10% of earnings into an individual account held by the AFP of the worker's choice. Table 3 reports the numbers of contributors in recent years. The AFP chosen for fund accumulation is also the source of

⁴Wagner, G. "La seguridad social y el programa de pensión mínima garantizada", *Estudios de Economía*, vol. 18 (June 1991), pages 35-91.

disability and survivors insurance. The mandatory contribution includes a commission in addition to the 10% for retirement, to cover this insurance and to provide income to the AFP. The mandatory contribution rate to the new system is in the 13-14% range. The maximum taxable income is indexed to the CPI, and is close to US\$17,000 at current exchange rates, in annual terms. In June 1992, only 3.8% of dependent contributors earned above the maximum taxable wage. The minimum taxable income is the Minimum Salary for one day of work. Contributions are mandatory only for dependent workers in the formal sector⁵.

Affiliates are free to select any AFP and to switch at any time after a minimum of four months with an AFP. The AFPs provide fund management services, do the record-keeping of individual accounts, purchase a group insurance policy for invalidity and death, perform collection and payment functions and answer questions and provide information about the workings of the system. The affiliates own the funds, with the resources of the AFP kept separate. By law, each AFP manages a single fund, with the complete return on the fund allocated to the individual accounts. The AFP's are regulated in a number of ways. The funds in the individual accounts cannot be given in guarantee for loans.

2.1.D. Phased withdrawal and annuity purchase

On becoming eligible to receive pension benefits a worker is able to choose between a sequence of phased withdrawals (with maximum size limited by formula), the purchase of an annuity from an insurance company, or a combination of these two. In the phased withdrawal option, the worker bears the longevity risk and investment risk, unless he falls to the minimum pension, where he bears inflation risk and budget risk. In the annuity option, the worker bears the risk of insolvency of the insurance company, which are regulated. The annuity market is restricted to indexed annuities.

While the accumulation has been going on since 1981, there were few pension benefits in the new system until 1988. The decision to force a switch of financial intermediary to obtain an annuity was in part motivated by the fact that the investment portfolio needed to back annuities is quite different (less heavy on equities) from the one of AFPs. In addition, there was a desire to spread out fund management among more entities.

⁵Instituto Nacional de Estadísticas, bulletin Indicadores de Remuneración y Empleo, June 1992, and Claudio Chamorro, "La cobertura del sistema de pensiones chileno", and Thesis N° 107 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, July 1992).

2.1.E. Disability Insurance

Disability insurance promises to top up the individual account to a target level set by formula, in order to allow purchase of an annuity in the private market. The worker retains the right to choose phased withdrawal.

The level of benefits depend on the contribution history of the worker. For covered workers whose first evaluation is issued while still working, the target total disability pension is 70% of the average of indexed taxable income over the previous ten years; and the target partial disability pension is 50% of the same average.⁶ We do not report the rules for independent workers, who can voluntarily be part of the system⁶. For covered workers satisfying lesser conditions of attachment to work, including those unemployed, the total disability pension is 50% of the average taxable income and the partial disability pension is 35% of the average taxable income.

Since 1990 there are two types of disability pensions. One is a pension for total disability. It applies when the loss of the ability to work is above 2/3. The second is a pension for partial disability, when the loss of the ability to work is between 1/2 and 2/3. Determination of disability is made by regional medical boards. In addition, disability pensions are always evaluated twice, the second time three years after it was first awarded.

2.1.F. Insurance for Survivors of young workers

Widows, disabled widowers, dependent children, and in some cases parents of deceased workers are eligible for survivor pensions, with a variety of rules for determining the amount relative to the earnings of the deceased workers and the numbers of beneficiaries. Like the disability pension, this is a defined benefit system with the formula set by the government, but operated by private providers and packaged with the other pension services.

2.1.G. Continuation of the old system

In the 1981 reform, switching to the new system was voluntary for workers covered under the old system. Most of the younger workers chose to switch. Thus, the old system was left with fewer contributors than pensioners. Table 9 shows the recent evolution of this system.

In the old system there are no statistics on the number of pensioners, just on pensions, with a number of people holding two pensions⁷. The low average taxable income in the old system is explained in part by the relatively large number of independent workers in

⁶We do not report the rules for independent workers, who can voluntarily be part of the system.

⁷Under some circumstances, a worker who switches industry can receive two pensions in the old system.

it. For example, in September, 1990, 63,819 independent workers contributed to the old system, and 48,316 contributed to the new system.

The contribution rate in the old system varies by social security institution. In March 1989 it was 18.84% in the Servicio de Seguro Social (blue collar workers) and 20.70% for the general plan in EMPART (white collar workers). Benefits in the old system are calculated in the conventional way, considering an average income for the last three years before pensioning, the total number of years of contributions and an accrual factor.

During the 1980's, the government merged the 30 civilian social security institutions into one, introduced computers and microfiches and streamlined the payments and collections systems. For the first time, a registry of employers that owed contributions was established, and a special collection procedure was organized in 1989.

There is one exception to the unification of the Old System: The Military and the Police continue to have separate social security institutions. Their pensions are calculated on the basis of the seniority rules that have been in force in these institutions for decades.

Although most employers are forced to collect contributions and pay them in full to the pension institutions, the Civil Service was an exception until very recently. In this practice originating in the 1950's, the government declares that close to half of a civil servant's compensation is wage and the rest is non-taxable for social security purposes. In case the civil servant is in the old system, he still gets full benefits, with the treasury covering the shortfall. For the government, the effect of this trick is that it delays contributions for an introductory period. However, for civil servants that have chosen the new system, this rule reduces reported taxable earnings and pension benefits without any guarantee that the government will pay late contributions - with interest - when they request a pension. A program to redress this problem was started in 1992.

2.1.H. Occupational accidents and professional disease insurance.

There is a separate program that pays pensions in case of worker accidents and professional diseases (WAPD). The disability insurance provided by the AFP's pays all cases not covered by WAPD insurance, so sometimes life insurance companies litigate with WAPD providers. Recent statistics show that in the AFP system the first evaluation yielded 667 new partial invalids and 1,657 new total invalids per year. In contrast, the WAPD system issued 308 new partial disability pensions and 89 new total disability pensions per year.

2.1.I. Voluntary Savings and Insurance Purchase

It is common to refer to individual savings for retirement (and individual purchase of life insurance) as the third pillar of retirement (and survivors) income provision. Incentives for such behavior include special tax treatment for savings, for voluntary life insurance purchase and contractual savings facilities. Chilean legislation includes three tax advantages for voluntary long-term savings and none for voluntary life insurance. These advantages are

available only by saving through the AFP that is handling the mandatory savings account of the worker.

Voluntary contributions added to the individual account held in an AFP are exempt from income tax at the time of contribution. This amount was limited to 10% of taxable income up to 1989, but is not limited now⁸. Interest earned in that account is free from tax as earned, but pensions received are treated as income. Withdrawals from these amounts are limited to pensions, which may explain why few individuals use this option. Severance payments made by an employer can also be transferred into the worker's individual account under tax-exempt status.

In addition to voluntary contributions to the mandatory savings account, individuals can make voluntary deposits into a second account at the same AFP holding the mandatory account. Funds in the second account can be withdrawn with a few days notice, provided the number of withdrawals per calendar year is four or less. Currently these savings are not exempt from income taxes, but enjoy favorable tax treatment of interest earnings on the accounts. If these funds are transferred into the old-age account, they enjoy full exemption from income taxes.

In contrast to this treatment of individual savings, there is no tax advantage for pension funds developed by employers under rules devised by themselves, with or without the agreement of the unions. This implies that one of the main driving forces behind the growth of private pensions in the OECD is absent in Chile.

A final aspect is that contractual saving programs are encouraged. Employers are mandated to collect contributions for contractual savings requested by the worker, provided they are arranged through an AFP. Out of the 1989 average of 108,730 deposits per month in the second (voluntary) account, 90.5% were part of contractual savings programs. The average of these monthly deposits was 12.8 US dollars per month in 1989⁹.

2.2. History of the Old System before reform

To place our discussion of political economy in context, we briefly review the history of pensions in Chile. The oldest pension systems in Chile were established by the Spanish Crown. After independence, the Army and Navy established pensions for veterans in the 1820's. In the late 19th century a pension system was established by the government for its own employees, on a PAYG basis. In the early 20th century the Railroad Company, fully owned by the state, created a separate pension system for its own employees, and close to 30 private companies followed its lead and then current international practice. Each employer designed a different pension regime.

⁸This amount was limited to 10% of taxable income up to March 1990, but is not limited now.

⁹Ministry of Labor of Chile, "Evolution of social Security in Chile, 1973-1989", (1989), pages 29-30.

2.2.A. Legislation of 1924

In 1924, Congress legislated mandatory contributions by all private firms. It is ironic that both the creation of the old social insurance system and the reform of 1980 occurred under military rule. The new mandatory pension system was residual, in the sense that those firms that had pre-existing plans were allowed to continue with them.

Different social security institutions (SSIs) were created for white and blue collar workers. It was designed as fully funded, although investment in government debt was expected to be substantial. The rules were different for blue collar and white collar workers. Blue collar workers would receive old-age pensions as of age 55, 60 or 65 (men and women). In contrast, white collar workers would receive a pension after 35 years of work (general plan), regardless of age.

The contribution rate for pensions was low in 1924-1952: 5% for blue collar workers and 10% for white collar workers. Total contributions rose from 1937 onwards with the purpose of financing health care and, in the case of white collar workers, severance payments also. Still, substantial surpluses accumulated and were invested in government bonds, apartment buildings and a few haciendas. Investment performance was dismal. The environment for investors became adverse, as interest rate caps in the capital market since 1929 led to negative real interest rates in 1932 and then permanently starting in 1939. The Great Depression, which had extreme consequences in Chile, led to a short bout of inflation in 1932, during which prices doubled and the real value of the government bond portfolio held by SSIs fell to half. The legislation establishing rent controls for dwellings eliminated another significant investment alternative for social security funds. Tariff policies that changed the internal terms of trade against the country and in favor of city factories made the investments in haciendas unprofitable, while investments in equity in industrial firms were not allowed. The result was that in 1947-1952 investment income represented only 8.67% of total income for the civilian SSIs.

In the case of blue collar workers, a substantial share of the cash surplus associated to the introduction of mandatory pensions, plus an extra 2% contribution introduced in 1937, was devoted to the establishment of free health services for members. In the case of white collar workers, most of the surplus was transferred back to members in cash, in the form of large family allowances. Table 10 reports on the uses of funds.

By the end of the initial period, the total contribution rate for the blue collar SSI was 7% to 9%, according to the region of work, and the government contributed an additional 1.7 to 2.7% of taxable wage. The white collar SSI was charging 23% of the taxable salary for pension purposes.

2.2.B. The Reform of 1952

In 1952 a drastic reform to the pension system took place. Following a reform proposal first presented to Congress in 1941 by Salvador Allende, and international trends inaugurated by the Beveridge Report in England, the existing pension system was unified and streamlined along a PAYG basis. This PAYG system would operate for the next 28 years. The first reform consisted in the separation of the health insurance system from the pension system. As the introductory surpluses had been used to establish a permanent expenditure program - free health care for blue collar workers - and it became clear that if pensions were going to be paid a financial crunch was unavoidable, separation served to insulate the health system from future financial pressures.

These reforms required a massive increase in contribution rates, spread out over three years. By 1955, the total contribution rate for blue collar workers was 15% , plus 5% of fiscal subsidy. In addition, in 1953 a new contribution was imposed on white-collar workers to finance new severance payments and family allowances. This added up to 17 additional percentage points of wages. The tax on formal labor increased from 9% to 32% of taxable salary.

The second reform of 1952 established that blue collar workers would get annuities as pensions starting at age 65 and calculated with a conventional benefit formula. It was defined as 100% of an average monthly salary, which in turn was the average of nominal salaries for the last five years, after adjusting for inflation the two earliest years. The result was a stochastic real pension, heavily dependent of the inflation rate during the last three years and the realized taxable salary over the last five years. Adjustments for subsequent inflation were legislated to occur only in January first of each year, if accumulated inflation since the last increase surpassed 15%. Given the large volatility of inflation in Chile, the variations in real pensions turned out to be substantial. In this reform, blue collar workers lost the option to withdraw funds at ages 55 and 60. Also many pensioners had their pension levels reset.

The law of 1952 established that at most 1.2% of contributions would be spent in administrative expenditure, without specifying what would happen in case this was not fulfilled. The actual figures in the 1960's and 1970's, excluding the cost of capital, ranged near 8% of contributions.

The third reform of 1952 changed the rules in the white collar SSI. Pensions were established for 65 years of age, calculated as in the blue collar SSI, but the option of a pension for 35 years of service was maintained - and most preferred it - . Women were had a younger pensioning age. One difference was that adjustments in pensions for subsequent inflation were legislated to occur when accumulated inflation since the last increase surpassed 10%. Another is that the inflation adjustment would be smaller for the pensions above the minimum salary.

2.2.C. Experience after the 1952 Reforms

The 1952 reform failed to create political incentives that would make sure that all benefit increases were financed. This can be seen in the benefit increases after the reform. For example, in 1956, affiliates who did not meet the minimum requirement on contributions were allowed to "fill in" the missing contributions using the funds from a loan provided by the same SSI, and without any penalty for the delay in paying the contribution. The loan would carry a very low nominal interest rate¹⁰. In addition, new groups with full rights to benefits were added, even though they had not completed their contributions. These new expenditures were first charged to the SSI, without legislating any tax increase or explicit revenue source to finance them.

Rent-seeking behavior coupled with the quest for a progressive image led to substantial inequities. On the one side indexing of white collar pensions above the minimum pension was below full past inflation. On the other hand, by the late 1970s close to 40% of expenditure was taken by "perseguidora" pensions, that granted full indexation to the wage level to a few high income workers.

No rules and organizations that would maximize the return and security of investments were provided to the two large SSIs. To the contrary, the legislature intervened in great detail, for example specifying how much funds would be directed to 25-30 year mortgage loans to affiliates and the interest rates that would be charged. They paid a nominal interest rate of 5% and amortization rate of 2% per year, in a setting where average inflation was close to 20%. The result was that the two large government-controlled SSIs obtained a rate of return much below the older, privately-managed SSIs. A calculation offered by Wallich (1983, p. 75) for the 1950-1977 period shows that the real value of assets held increased by 804% for privately-managed SSIs and only 57% for the large public SSIs¹¹. The difference is assigned to the fact that privately-managed SSIs were not encumbered by legislative mandates nor by the frequent use of their cash balances for monetary control.

Although the pension system fell far short from performing its insurance purpose adequately, this does not mean that its finances were out of control, because the level of benefits was quite low. The Old Chilean system was close to overall cash equilibrium in 1976. In addition, it appears to have been close to maturity by 1977, with the ratio of contributors to pensioners stabilized at a number close to 2.0, typical of OECD pension systems in which the introductory period is over.

We conclude that the old system had a number of fundamental problems. The level of pensions was low, with close to 70% of pensions in 1979 being minimum pensions¹². The

¹⁰Wallich, Christine "Savings Mobilization through Social Security: The Experience of Chile during 1916-1977", Working Paper N° 533 (Washington, D.C.: World Bank, 1983), page 61.

¹¹Wallich, C. (1983) op. cit. page 75.

¹²Büchi, Hernán "Social Security Reform in Chile", unpublished mimeo presented at Seminar at La Jolla, CA, organized by the Interamerican Development Bank (Santiago: Instituto Libertad y

real value of pensions was highly variable over time - the standard deviation of the real value of minimum pensions was 29% of the mean for the 15 years between 1955 and 1979 for which Wagner (1991) presents data¹³. In the absence of significant investment earnings, the contribution rates were high. In 1979 contribution rates for pensions alone were 22.95% in the blue collar SSI and 24.91% in the white collar SSI, and total contributions reached the 51-59% range in 1976. Ignoring family allowances, the pension system was regressive. A full evaluation of the redistributive impact of all the traditional social security services including pensions, family allowances and medical care is not available.

Some of the risk that the pension system posed to the fiscal balance had been limited by a constitutional reform in 1970, which restricted the right to initiate law in pension matters to the executive branch. However, the old system contained no political incentives to prevent populist management by the executive, as in 1971, nor to manage efficiently the demographic transition through which Chile would go in 1990-2030.

Desarrollo, March 1993), page 8 ; and José Piñera "Presentation of the Pension Reform" (1980) reprinted in Piñera, J. El Cascabel al Gato: La Batalla por la Reforma Previsional, page 159 (Santiago: Zig Zag, 1991)

¹³Wagner, G. (1991), op. cit. , page 60.

3. DESCRIPTION OF THE 1980 REFORM AND THE TRANSITION

This section includes a description of the 1980 reform and its transition rules (3.1) a description of subsequent legislated changes (3.2) and the main aspects of the transition itself (3.3).

3.1. The reform up to 1980

3.1.A. Earlier reform proposals

Reforms had been proposed for many years. In 1962 the Prat Commission issued a three-volume report proposing structural reforms to the pension system. In 1968 the Frei government proposed the establishment of a new funded pension system out of additional contributions, with the funds centrally managed by a Council of Ministers, but it failed to obtain Congressional approval because it would concentrate too much power.

In 1973, before the military coup, a group of economists circulated a diagnosis and proposal for reform called the "brick". As this proposal was largely implemented, it is useful to register their diagnosis: excessive contribution rates, discrimination and injustice in benefits, and high administrative costs. There was no mention of the low quality of insurance offered to the individual worker, of the lack of political incentives to limit the fiscal cost, nor of the reduction of the stock of national savings that the introduction of the old system had caused.

Key elements in their proposal included: separation of the income redistribution and insurance functions, the options of lump-sum withdrawal and annuity purchase, replacement of legislated rules for contractual rules in fund management, non-nationalized fund management organized along the lines of savings and loans associations with investment of contributions in bonds and equities issued by the private sector, and full privatization of the selection of provider.

3.1.B. Preliminary reforms in 1974-1979

The first pension reform occurred over 1974-1979, when a series of steps were undertaken with the purpose of preparing the ground for the reform outlined in the "brick". The most notable were:

- a) A program of fiscal tightening (shown in Table 11) that started in 1977, as soon as the recovery from the recession of 1975 had taken hold and GDP growth took off. Its main purpose was the financing of the planned reform to social security. The government study groups had found in 1974 that a transition that avoided debt financing would create a substantial budget deficit, and a decision was taken to build a budget surplus to finance it. The alternative of building the surplus simultaneously when initiating the reform was considered fiscally risky.

This program implied efforts to reduce the growth rate of public consumption (wages plus purchases of goods and services) over a long period, and its political viability was aided by the boom in economic activity. The buildup of the surplus becomes really large only in 1979, as seen in table 11. From a political economy standpoint, it is possible that starting a fiscal saving program was possible only because the Chile of 1979-80 was under military control and with the military open to radical proposals from its economists.

- b) Introduction of uniform indexing rules for all pensions. This was the most difficult reform from a political point of view, because a large number of the "perseguidora" pensions with the best indexing rules were held by retired army and navy officers and Chile had a military government. The agreement that led to this uniformity included some adjustment of the salaries of active officers.
- c) Introduction of uniform pensioning ages of 65 for men and 60 for women in civilian Social Security Institutes. This eliminated the right to obtain a pension through years of service alone. The implied delay in retirement ages left the old system with a cash surplus after a short transition period.

3.1.C. The reform of 1980

The 1980 reform meant an implementation of the proposal in the "brick", as outlined above. Privatization of provision was the most controversial element of the reforms. Substantial effort was devoted to limit the risks of fraud. Pension funds (PF's) were defined to be separate legal entities from fund management companies (AFP's), minimum diversification guidelines were incorporated in the law and a strong new supervisory body was created. Investment in equities and foreign investment were not allowed in the initial law, as little regulatory experience in their regard was available. Investment in corporate bonds was limited to non-holding companies, defined in turn by the share of directly productive assets over total assets. Some unions and employer associations were goaded to start their own fund management companies, to assure diversity.

In response to further political considerations and concern about the efficiency of existing banking supervision mechanisms, a February 1981 law prevented banks from becoming providers to the new pension system. A modernization of financial regulation started at this time, three years before the bank insolvency wave of 1983, with the introduction of prudential regulation to banking in 1980. A law that imposed a schedule of reduction of bank loans to affiliated parties in August 1981 (de la Cuadra and Valdés-Prieto, 1993) and the passage of modern securities and companies laws occurred in 1981 (in preparation since 1978)¹⁴. It is suggestive that worries among the military about the

¹⁴De la Cuadra, S. and S. Valdés-Prieto, "Myths and Facts about Financial Liberalization in Chile: 1974-1983" Chapter 2 in *If Texas Were Chile* (U.S.A.: Institute for Contemporary Studies, San Francisco, California, 1993), page 88.

solvency of banks started only after the pension reform was approved, and it was realized that most of the funds would be invested in bank debt for the first years. Investment in equity was banned until 1985 because of fears of fraud in the local stock market.

As individual choice of provider was not perceived as an important issue, very little attention was devoted to it in the law. For example, there was no attempt to offer a legal framework to potential trustee institutions that could help individual affiliates with their decisions. Groups of workers represented by trustees were implicitly discouraged by a regulation that prohibited discounts in commissions charged, even in the case of groups.

Civilian workers were left free to switch to the new system, because constitutional protection of their property right to an entitlement in the old system prevented the government from forcing them. Those working for the Army, Navy, Air Force and Police have not been allowed to switch up to the present¹⁵.

Those already pensioned continued receiving their pensions under the old system's rules. For active workers, entitlements in the old system were acknowledged in a way consistent with the new defined contribution approach. Those workers that in the previous five years had contributed for at least 12 months to a given SSI, and switched to the new system, were issued a "recognition bond", which was supposed to represent the contributions made in the old system. This bond would mature when the worker reached pensioning age and would earn 4% real between the date of switch and maturity.

The budget surplus built up in the previous years, plus the cash surplus projected for the old system, were expected to finance the transition deficit. The projected deficit did not include interest costs of new public debt issued to finance the transition, because no such debt was planned. Contribution rates were reduced to 13-14%. Those that remained in the old system did not experience a cut in contribution rates. The response of the workers in the formal sector was a massive switch to the new system for those below age 45.

¹⁵Two explanations have been offered for their exclusion from the 1980 reform: that significant groups of officers feared fraud by private providers; and that the military were not prepared to overhaul their complex compensation system, which would be required if they switched to the new system.

3.2. Notable legislated changes to the new system in 1981-92

The new pension system has been subject to many reforms without altering the basic structure. The three main areas of reform have been in the investment area, the design of disability and survivor insurance, and the authorization of early pensioning.

In the investment area, notable reforms include the authorization of investment in domestic equities in 1985 and in foreign investment in March 1990. This last authorization was postponed by the Aylwin government until late 1992. More generally, the existence of growing pension funds, seeking additional investment opportunities, has been a powerful stimulus for the authorities to seek financial innovation. For example, further reforms are currently under discussion, including new regulations to reduce conflicts of interest between fund managers and affiliates.

Two reforms of disability and survivors insurance deserve mention. Initially, in the insured event, the AFP guaranteed that the life insurance company it had hired would pay the real annuity defined by law. Starting in 1988, this insurance was divided in two parts. The insurance now pays a large lump-sum to the individual account of those affiliates that suffer invalidity or death. Then, a real annuity may be purchased by the individual affiliate or survivor.

In March 1990, coverage was extended to partial invalidity. In addition, rather than investigating disability once, all invalidity pensions are granted for three years, and are reviewed at that point. Some rules give incentives for rehabilitation of invalids and others tend to discourage fraud.

Early pensioning was created in 1988. This reform waived the age requirement for those affiliates that could show that the funds they hold in their individual account are sufficient to purchase a real annuity or start phased withdrawals at an adequate rate.

3.3. Aspects of the Transition

This section considers several aspects of the transition, the setting up of the new system and its early years. A critical first step was the creation of new financial intermediaries and new regulatory authorities. Then we turn to the transition for individual workers - the rules to cover older workers going to the new system and the organization of the choice between old and new systems. Third we consider the short-run fiscal implications of the change. And fourth we briefly consider the politics of the change.

3.3.A. The supply response: Entry and exit

Entry into the AFP market proceeded in several waves. In May 1981, eleven AFPs started operations, and a twelfth followed at the end of the year. This was a period of massive effort by suppliers to achieve scale and increase their total market. The next wave started in 1986, when the first AFP oriented to high income workers appeared, in this case

organized by a labor union. The third wave of entry occurred in 1992, when 5 new AFPs started operations. Exit of AFPs has not been traumatic. Several AFPs went bankrupt in the crisis of 1982-1983 without affecting the value of the pension funds they managed. For example, the creditors of two failed fund management companies, Alameda and San Cristóbal, agreed to merge in 1984. Banguardia, an AFP formed by a labor union, has been tightly controlled by the Superintendency since 1990.

In the life insurance segment, a medium-sized company that sold real annuities went bankrupt in 1984. This was a result of large losses associated to the devaluation of August-September of 1982 and high indebtedness with banks¹⁶. As prescribed in the law, pensioners absorbed the loss of 25% of the annuity value in excess of the minimum pension. As actual losses were larger than this amount for many pensioners, the state guarantee will operate. The government will begin covering its loss when the existing funds are depleted, which had not happened until 1992. Apparently political pressures for a 100% guarantee were absent. It is surprising that only one life insurance company failed in a recession where GDP fell 14.3%. After this experience solvency regulations on life insurance companies were tightened in 1987 and in 1989.

The annuities market also has exhibited a rapid supply response. In the four years between 1988 and 1992, close to 15 providers entered this market, taking the total to 19. Another important element was a rapid evolution of solvency regulations, which initially required excessive cash investments from shareholders when an annuity was sold. A concept close to duration mismatch was introduced in 1988, reducing significantly the financial barriers to entry into this industry.

3.3.B. Marketing during the transition

The start up of the system was notable because of massive marketing campaigns, including TV advertisements and many salespeople, many of which were subcontracted to specially set-up marketing firms. Many affiliates needed information to decide whether they would switch to the new system, and salespeople were willing to influence them. (An alternative procedure would have been to force affiliates to decide first whether to switch or not, without allowing them to choose an AFP until six months after that decision was taken.) The first selection of AFP was particularly difficult because there was no track record to distinguish between AFPs.

In June 1982, two months after affiliates could switch into the new system, a regulation forced AFPs to hire directly all the salespeople they employed. In August 1982, a Registry of AFP Salespeople was created, and AFPs were restricted to hire from the registry only. This registry allowed the Superintendency to punish those found to deceive affiliates. In September 1983, personnel in branch offices became regulated, and AFPs were banned

¹⁶Frugone, J.P. "Análisis del mercado de rentas vitalicias previsionales", Thesis N° 106 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, 1991), pages 95-98.

from sharing offices with others. Chilean AFPs are prohibited from entering into marketing agreements with other firms, including banks. The purpose is to ban joint marketing that may allow affiliates to receive services in addition to those specified in the law. However, this regulation was relaxed in January 1993 regarding the second savings account mentioned in 2.1.I.

The concern leading to this ban is natural since a primary reason for mandatory savings is a tendency of people to save too little. This suggests that many people would try to defeat the system by accepting upfront gifts in return for agreeing to a low rate of return on their savings¹⁷.

A similar transition has occurred in the annuity markets since early pensions were authorized in 1988. In this case there has also been a large expenditure in salespeople, in the form of insurance brokers. Some brokers have charged commissions close to 4% of the accumulated balance in the individual account. Contrary to the AFP case, there has not been strong regulatory action in this area up to now.

3.3.C. Recognition Bonds

Those workers that in the previous five years had contributed for at least 12 months to a given SSI, and switched to the new system, were issued a "recognition bond," which was supposed to represent the contributions made in the old system. This bond would mature when the worker reached pensioning age and would earn 4% real between the date of switch and maturity.

The amount of this bond at the individual level was calculated on the basis of the average taxable income reported in the months for which contributions were paid, the number of months of contribution since affiliation to the old system, and actuarial factors that distinguished by sex and age. Arrau (1992) has argued that substantial redistributions occurred with this procedure, some of which were regressive and others progressive¹⁸. Some of these redistributions are those typically associated to the change from a conventional benefit formulae that do not consider the timing of contributions and impose common actuarial factors. Others were due to the inability of SSIs to access personal records reliably.

Those particularly losing on the change from defined benefit to defined contribution were women (with longer life expectancy at retirement age) and those with steeper age-

¹⁷A similar issue of a trade off between individual preferences and government goals comes with education vouchers, where parents may be more interested in money than in education. There was a report of a school in England, where there are education vouchers, that "offered a discount on shower units as an incentive to parents to enroll their children" (Susan Chira, "Schools Vie in a Marketplace: More 'Choice' Can Mean Less", New York Times, January 7, 1992, p. A1).

¹⁸Arrau, P. "El nuevo régimen previsional chileno", Chapter 2 in Regímenes Pensionales (Bogotá, Colombia: Friedrich Ebert Foundation, 1992), page 61.

earnings profiles, presumably disproportionately concentrated among those with higher income. In addition, according to Arrau (1992) there were mistakes in the selection of actuarial factors for calculating the recognition bond¹⁹.

It is estimated that over 10,000 affiliates switched to the new system even though it was financially costly for them. During the 1980's the authorities passed several laws allowing affiliates that had been in the old system to return to the old system. As other affiliates were not subject to a reduction in benefits to finance this increase, these redistributions were financed with general revenue.

3.3.D. Fiscal impact of the transition

Table 12 presents the fiscal impact of the reform with the actual experience up to 1987 and projections until 2015. The numbers exclude Defense and Police SSIs, assistance pensions and minimum pensions. The fiscal impact is defined as the deficit at the Old System (Contributions minus Pension Benefits) plus the value of the recognition bonds that come due in each year. The deficit in the Old System is not entirely due to the transition because substantial minimum pensions are included in the expenditure side, but they may be compensated by the slight surplus it reached after the increase in retirement ages for white collar workers.

A major issue is the violence of the business cycle experienced in Chile in the 1980's, which led to a 14.3% drop of GDP in 1982 and stagnation until 1985, to be followed by a very fast recovery, including years where GDP growth was 9.5% (1989) and 10% (1992). This is important because the fiscal impact of the transition is strongly pro cyclical. That is why the table presents data and projections with different rates of GDP growth. In fact, the transition deficit reached up to 4.84% of actual GDP due to fluctuations in GDP, contributions and expenditure. This shows the role of the decision to build a budget surplus before the reform, as it started with a fiscal balance of 5.5% of GDP in 1980.

On the other hand, if everybody had remained in the Old System the recession would have caused a substantial pension deficit, because unemployment rates rose to 30% and real wages dropped in 1982. The budget crisis did result in a reduction in pensions in the old system (via a COLA freeze) but only in 1985, very late in the recession. Because of the reform, for those in the new system, the recession showed up as temporarily smaller contributions to the new individual accounts. Most affiliates have recovered contributions in the expansive phase of the business cycle. In contrast, the long run impacts of short run adjustments in benefit formulas under conventional systems depends on the politics affecting the type of cut legislated and the type of adjustment (if any) once the fiscal crisis is over.

¹⁹Arrau, P. (1992), op. cit. pages 51 and 62.

3.3.E. Fiscal Incidence of the Transition

The incidence of financing a transition naturally depends on the sources of funds used to finance it. In the Chilean transition, there were several different sources available.

- (a) A budget surplus close to 5.5% of GDP had been built by 1980, with the aim of financing the transition. This meant that the primary balance did not have to move simultaneously with the reform.
- (b) Although the authorities preferred to avoid the issuance of domestic debt, it was in fact done in 1983 (Ortúzar, 1988), apart from the issue of recognition bonds²⁰. In Table 6 we show that the holdings of government debt by PF's have increased. However, these increases should not be compared directly with the transition deficit because the Chilean government also financed with domestic debt issues a cyclical deficit in 1982-87 and the accumulation of international reserves in the early 1990's.
- (c) In 1985-89, the privatization of social security happened in step with the privatization of other parts of the economy. Thus there was revenue from the sale of state assets, including state enterprises, part of whose shares were bought by PF's. This was not a substantial amount.
- (d) After the increase in pensioning ages to 65, the civilian SSIs themselves were expected to generate some cash surpluses from the delay in the payment of benefits under the old system.

Thus the four sources were general revenues (increased taxes or reduced expenditures), borrowing, sale of assets, and reducing benefits under the old system. Source (d) taxed formal sector labor, while source (a) was based on general revenue, close to half of which was raised through a value-added tax on consumption. As part of the diagnosis at the time was that total taxes on formal labor were excessive, a secondary purpose of the transition was to change the financing mix and the associated fiscal incidence.

3.3.F. The macroeconomic impact of the transition

A transition to a funded system (that is not debt financed) represents an increase in taxes on current generations and an increase in capital (and so wages) of future generations. Thus, on long run considerations, the stock of savings must increase. In the short term there might have been a drop in consumption, based on the same considerations.

²⁰Ortúzar, P. "El déficit previsional: recuento y proyecciones: "in S. Baeza and R. Manubens, eds., *Sistema Privado de Pensiones en Chile* (Santiago: Centro de Estudios Públicos, 1988), page 121.

However, the decision to reduce contribution rates in the new system immediately, from close to 22% to approximately 14%, had short-term macroeconomic implications in the opposite direction that appear to have been far more important in the short run. In fact, private consumption increased abnormally in 1981 as take-home wages increased extraordinarily. This short-term macroeconomic result could have been avoided by a gradual reduction of the contribution rate in the new system over a period of five years. More fundamentally, in light of the diagnosis that pensions in the old system were too low, contributions could have been reduced by less.

3.3. G. Transition in Political Incentives

A critical element in the long run impact of funding the social security system is the impact of this change on the rest of the government budget. Central is the question of whether the transition will be tax or debt financed. Although in Chile the maximum share of a pension fund's portfolio that may be invested in government securities is limited by law to 45%, the government could still achieve full debt financing by selling bonds to banks and companies who in turn issue securities to pension funds. That is why the critical issue for the long-term implications of this reform for the stock of savings is the effect it may have on the political incentives faced by subsequent Finance Ministers.

The reform appears to have important effects on political incentives, due to the way in which budget accounting is done. As Finance Ministers dislike presenting budget deficits to public opinion, a pension reform like the Chilean one, that increases the reported deficit, may create political incentives for an improvement of the budget balance. In the Chilean case, the democratic government installed in 1990 wanted to avoid populism, which required an austere public spending image. A shift to 100% debt financing of the transition would have looked definitely populist. The AFP industry, fearing nationalization, would have lobbied against such a shift strongly. Table 13 shows the fiscal balance up to 1991.

The reported budget surplus fell 45% of GDP comparing 1980 and 1991, so the government currently claims it has a balanced budget. The true story, shown by the primary surplus excluding pensions, is that after worsening during the recession of 1982-85, the general government returned to the same primary balance that was built over 1977-80 in preparation for the reform. Therefore, the Chilean reform locked in the primary surplus built in preparation for the reform. This may or may not be desirable, depending of the welfare value of this long-term fiscal saving program.

Another important transition has been the change in the incentive to raise pensions. Since 1981, legislated increases in pensions have been limited to the old system, assistance pensions and minimum pensions. In the only exception, regarding the 1992 industrial conversion program for coal mines, the government proposed an early payment of the recognition bonds owed to targeted coal miners, but the amount was appropriately discounted so it entailed no fiscal cost. Another interesting case arises from the election promise of the Aylwin government that early pensioning would be available under special conditions for workers in heavy and hazardous jobs (the 10-years-ahead pensions for copper

miners found in the Old System were abandoned in 1979). Union leaders and politicians devoted substantial efforts to this issue, but they have not reached a consensus about the way to finance top-ups for the individual accounts of these workers - or even whether top-ups are needed, because a number of workers in these jobs earn salaries above average.

Therefore, legislated redistribution has not been impossible but has required explicit evaluation of its fiscal cost. The need to use general revenue rather than specific taxes on the balances of other affiliates has induced the government to be conservative, as in the case of coal miners. After the return of democracy in 1989, politicians and national union leaders adapted quite rapidly to this new setting reorienting their attention to other policies, as pension policy ceased to be considered a specially rewarding area.

An important hypothesis is that during a tax-financed transition, those that remain in the old system are weakened politically because their pensions become a visible prime target for deficit reduction. This was not borne out in the Chilean case. During the early 1980's, the traditional practice of reducing real pensions when the government budget worsens by merely avoiding a timely adjustment for past inflation was not followed. Only in 1985, after severe recession had reduced real wages substantially, a COLA freeze was applied to the earnings-related pensions paid by the old system. This can be compared with the timing of fiscal policy changes: general taxes were raised in April 1982 and public investment was reduced during 1982, early into the recession of 1982-85. However, this does not allow a rejection of the hypothesis because this happened during a military government heavily influenced by economists.

The Pinochet government took advantage of the subsequent boom in economic activity to legislate a partial recovery of pensions paid in the old system. On the other hand, it allowed inflation to reduce assistance pensions substantially. The new democratic government that took office in 1990 continued taking advantage of the boom to legislate substantial increases in assistance and minimum pensions and a full recovery of pensions paid in the old system. It has recently upgraded the pensions paid by the old system to civil service employees.

With pensions under the new system paid by private companies, they have become largely insulated from the political process. The adaptation of affiliates to this change has been slow, because few believed in 1981 that pensions would stop being determined in the political arena. As experience has accumulated, a few affiliates have begun to make voluntary contributions to their individual accounts, suggesting that the perceived value of contributions has increased.

4. ECONOMIC ANALYSIS OF THE NEW SYSTEM

In this section, we review the AFP markets, the provision of disability and survivors insurance, the annuity market, redistribution, the labor market, the regulation of investment by AFP's, the capital market, government guarantees, and the political economy of pensions.

4.1. AFP Markets

We consider in succession demand, supply, and equilibrium.

4.1.A. Demand

Individuals are free to select any approved AFP, and to switch after at least four months in an AFP. For an individual trying to select across AFP's, there are three services to be considered. The AFP provides both disability and survivor insurance. The rules for this insurance are discussed in 4.2, but the point here is that there is little scope for differences across AFP's in this regard. A second service is the provision of information. Different AFP's do vary in the convenience of offices, the courtesy of staff, the availability of explanations about the working of the system. In particular this is an issue in smaller towns distant from large cities. The third service is collection, payments, record-keeping of individual accounts and mailing of account statements every four months.

In addition to the quality of the services mentioned above, fund managers can compete in four ways. One is in ability to select "good" investments - that is, to have stochastic dominance of returns of one fund over another. Not surprisingly, two studies of performance by the funds (Walker, 1991, Zúñiga, 1992) suggest that in the period 1986-1990, no AFP was off the risk-return frontier that was available with the rules on portfolio limits²¹. A second is to select a different point on the risk-return frontier. Legislated restrictions on portfolio structure limit the potential degree of difference across funds. A third is to have low commissions (perhaps as a result of a strategy that generates low costs). A fourth is in the division of the commission charge between a fixed part and a part proportional to wages.

Different individuals will respond differently to these elements. Individuals differ in the size of their funds relative to their current earnings, in the level of their earnings, and in their degree of risk aversion. For those with low funds relative to earnings, the commission charge is more important relative to the rate of return on the funds. The division of the commission charge between fixed and proportional parts differentially selects across individuals of different wage levels. It also selects between people with different sensibilities between deductions from money going into the fund and out of pocket funds, since the fixed part of the commission is deducted from the fund, while the proportional part is paid out of pocket. In addition, one AFP makes use of the allowed option of charging a percentage of the fund for a worker who transfers an existing account into the AFP. (No such charge is allowed on exit from an AFP, nor is it allowed to charge a percentage of the fund that is being managed.)

²¹Walker, E. (1991a) "Desempeño Financiero de las Carteras Accionarias de los Fondos de Pensiones" Working Paper N° 137 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile), page 29, and F. Zúñiga, "Desempeño de los fondos de pensiones: impacto de las restricciones legales", Thesis N° 97 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, 1992) pages 72-86.

To this description of the basis for choice for idealized demand behavior, we add two realistic features. One is inertia. Individuals who have made a previous choice may not be active in monitoring the alternatives and considering switching. They may prefer directing their attention elsewhere. They may recognize that it is not easy to gather information and to evaluate alternative portfolio strategies in order to compare funds. The present value calculations needed to compare a current commission with higher future benefits may be unfamiliar. Complementing this element is the role of advertising and sales people. While some of the role of the latter is to overcome the inertia mentioned first, in practice salespeople may be targeting individuals who are aware of the alternatives as well as those who are not.

4.1.B. Supply

In considering the supply behavior of AFP services, there are three dimensions to describe. One is the structure of costs associated with insurance provision, information provision, and fund management. Second is the selected structure of advertising, and commissions to attract and hold affiliates. Third is the potential for entry.

Table 14 shows the structure of costs (divided among insurance, administration, and sales) of different AFP's over time, along with numbers of affiliates, numbers of contributors, amounts of insurance and size of funds managed. Some AFP's have a self-described strategy of keeping costs low. Others do not describe themselves in the same terms. From the Table and the original sources, several conclusions are apparent. One is that there are significant costs associated with starting an AFP. This is revealed in the tendency for costs to fall in the early years of the system and after the entry of a new AFP. Some of the industry-wide decrease in costs presumably comes from learning by doing at the industry level. It is not clear that economies of scale go much beyond the level of 60,000 contributors. Although Provida appears to contradict this, in 1987-88 the average administrative cost of Provida was noticeably below the numbers that Santa María and Habitat have in this Table, when Provida had the same scale that these others have now. It is also clear that for the same scale, the differences in average costs are substantial. This is due in part to different clienteles. On the basis of commission rates by income class, higher income contributors pay more (Arrau, Schmidt-Hebbel and Valdés-Prieto, 1993).

Entry by a new AFP requires approval by the government, although purchase of an existing AFP does not require such approval. In order to enter, a new firm must satisfy the minimum capital requirements, shown in Table 16.

It is interesting to examine the history of ownership of AFP's. When the system started in 1981, four classes of AFP were formed: (a) those linked to business groups who also owned banks or insurance companies; (b) those linked to business groups who did not own financial intermediaries; (c) one linked to an employers' association (Example: Habitat); and (d) those linked to unions or employees' associations (Examples: Magister, Cuprum). Initially, the market share of those in group (a) was close to 50%, but then it fell. Entry in the period 1986-89 was concentrated among union-sponsored AFP's. Entry in 1991-92 was

evenly divided between business groups (Qualitas - affiliated to CIGNA-, Bansander - affiliated to Santander-, Fomenta) and unions or employer-sponsored AFPs (Bakeries (Previpan), banking employees (Banguardia), and Laboral).

In 1983, with the deep recession that took unemployment close to 30%, commission income fell and AFPs suffered, some of them falling into insolvency. The Pension Funds did not suffer losses. Even more important, the business groups that owned some of the largest AFPs failed and were taken over by the government, even though their AFP affiliate continued operating successfully. Through both mechanisms a large number of AFPs were out for sale or liquidation. In the case of a couple that failed, the Superintendency took charge of liquidation (as provided in the law) fused the remains and auctioned the AFP. It actually auctioned the access to affiliates enrolled in those AFPs, in the sense that no expenditure in salespeople was necessary to obtain their affiliation. In this way AFP Union was bought by American International Group (an insurance group). In the case of the AFPs whose owners were taken over, a Special Liquidation Commission auctioned controlling share packages. At this point Bankers Trust and Aetna came in to buy Provida and Santa María. In 1991, a French insurance company bought AFP Proteccion from the union of workers in Banco del Estado (a state-owned commercial bank). In January 1993, Bankers Trust sold its controlling package in Provida to a coalition of three local business groups of intermediate size.

4.1.C. Equilibrium

Without spelling out a specific model of equilibrium, we will refer to the outcomes that have occurred in this market as an equilibrium.

In particular, it is interesting to ask about differences in the distribution of earnings levels across different firms. Table 17 shows some data on differences in affiliate populations. There are two reasons to be interested in the patterns of affiliation in this market. First, they imply patterns of cross subsidization since both administrative costs and insurance costs are uniformly priced to affiliates. Second, one can consider what might happen to equilibrium if regulations were changed. This is a major issue because of the income distribution implications of changes in allowed patterns. In turn, the allowed pattern affects income distribution.

A second issue is the pattern and level of charges made by AFP's. By law, firms are restricted in the pattern of charges that is allowed to uniform pricing, although there are free to select the levels. In Table 18 are the patterns of charges in several recent years. It is clear that firms follow different strategies in the division of their charges between the two types of cost. The AFP pricing structure is regulated by law, which requires a single commission structure for all affiliates - they are not free to negotiate different commissions with different individuals or groups of individuals (such as the set of employees of a large firm). The latter condition is presumably relevant for the lack of interest in large firms in giving advice to their employees, in contrast with the widespread practice of giving advice on the selection of a

health insurance company. In considering the implications of this restriction, one would like to know the separate impacts of efficiencies of scale in administrative costs, efficiencies of scale in marketing, and simply market power. Those not in large groups would also be affected by group formation and commission negotiation.

Regarding the level of commission charges by AFPs, Valdés-Prieto (1993) gets from the financial statements of AFPs in 1991 a net commission income of 63.408 billion pesos, or 169.3 million dollars, for services excluding invalidity and survivorship insurance for the affiliates²². Dividing by 3.282 million effective affiliates (those covered, i.e. those that have contributed at least once in the last 12 months), we obtain an average annual cost of 51.6 dollars per effective affiliate. This is close to the costs in private pensions in the US, but much larger than the costs in uniform government-managed conventional systems. Table 15 offers additional breakdown, indicating the average marketing cost per contributor, the number of salespeople employed, the average non-marketing administrative cost and the number of other employees. The cost numbers seem to be roughly comparable to those one finds in the life insurance industry in advanced economies. For example, we note that for the U. S., approximately fourteen percent of (stock) life insurance company income goes for operating expenses plus dividends to shareholders, with roughly one-third of this going for selling costs²³. In the Chilean case, there appears to be an increase in sales personnel in recent years.

The presence of a competitive market with individual choice is supposed to accomplish three goals. One is to keep pressure on all firms to keep costs low and returns on the risk-return frontier. From this perspective the critical question is the balance between cost saving arising from competitive pressure as opposed to costs generated by marketing associated with many firms and individual choices. The balance seems to be on the negative side. The second goal is to have an array of alternative "products" in the market and to have a pattern of choices reflecting differences in preferences. It is not clear that there is much choice in the Chilean market, apart from the choice that is caused by regulations that make the portfolios of large AFPs different from those of small AFP's. Some of this lack of diversity comes from restrictions on fund portfolios. Some of it comes from restrictions that each AFP have only one fund. Some of it may come from the penalty imposed on an AFP if its fund shows a return that deviates too much from the ex-post average rate of return of all funds. In addition, it is not clear how much of the public has sufficient awareness and understanding of risk-return tradeoffs to select reasonably. Therefore, the second goal does not appear to be important in Chile now. The third goal is to insulate the pension accumulation process from political interventions, which we discuss at length in sections 3.3, 4.9 and 5. Summing up, the privatization of provider choice seems to have yielded benefits in terms of insulation from the political process, but to be costly in terms of commission charges.

²²Valdés-Prieto, S. 1993 (b), "Administrative Costs in the Chilean Pension System: Evidence from an International Comparison", mimeo The World Bank (Washington, D.C., January) page 8.

²³American Council of Life Insurance, 1992 Life Insurance Fact Book (Washington, DC: American Council of Life Insurance), page 76.

4.2. Disability and Survivor's Insurance

Workers in the formal sector are forced to have insurance in the event of death or disability²⁴. The insurance amount is a lump sum which is meant to supplement the balance in the individual accumulation account. The target balance is set by statute to finance a target pension equal to 70% of the average of CPI-adjusted taxable earnings over the previous ten years, with smaller legislated amounts for widows and dependent children. In order to receive a disability pension a worker must go through the following procedure. There is a first evaluation by the medical board, which determines if a pension is due and whether it is for total or partial disability. This pension lasts for three years. At the end of this period, there is a second evaluation. If disability is found to still be present, the pension becomes permanent. The medical boards can bring forward the second evaluation, at the discretion of the Superintendency. According to the law, there is no requirement for the invalid to retire from the labor market.

In the accumulation of funds for retirement, the government specifies the fraction of earnings that must be saved, leaving the amount of retirement pension to be determined endogenously. In contrast, the government specifies the amount of disability and survivors insurance that an individual must have and leaves the charge to be determined endogenously. In addition, these two insurance products are priced according to group principles, not individual principles. That is, the government requires that an AFP use the same commission structure for all affiliates. This is particularly in contrast with the annuity market which we discuss below.

Thus this market does not allow pricing to reflect the amount to be received in the event of collecting insurance, but only an approximation of that amount. As the cost of providing these insurance amounts varies with the likelihood of death or disability, which varies in the population in a number of ways, this implies that AFP's will prefer some affiliates to others, leading to risk identification expenses.

The AFP's are required to purchase reinsurance from insurance companies. Frequently, they engage in a risk sharing contract with insurers so that the (typically) excess of premium over benefits paid is partially returned to the AFP (not to the fund managed by the AFP, so that these return payments are part of the cost paid by the workers). In addition, the insurance companies typically reinsure the risk of unusually high claims in the London reinsurance market.

If the market for affiliates were a market where consumers were highly sensitive to price, there would be little scope for AFP's to convert higher premiums into income. With limited sensitivity, this is possible. This represents a profit opportunity that is no different from the profit from having commissions that exceed costs. In June, 1992, the

²⁴Up to 1987 individuals had the option of purchasing additional insurance from their AFP.

Superintendency published a weighted average of the costs of these contracts of 1.06% of taxable wages. In contrast Valdés-Prieto and Navarro (1992) have examined benefits paid to the affiliates from 1987 to 1990 and estimated the benefit rate to be 0.84% of taxable earnings. Taken literally, these numbers suggest a charge of 0.22% of taxable earning. This is divided up between the insurance company and the AFP - which receives back payments after claims have been settled -. Multiplying by an average contribution of 25.0 dollars per month, we get 6.7 US\$/year for invalidity and survivors insurance. A charge of $0,22/1,06 = 21\%$ of premiums is high compared to U.S. data on group insurance with which we are familiar.

From the risk bearing perspective, one can ask who should bear the risk of aggregate disability and mortality in excess of that anticipated by the actuaries. A priori, there is neither gain nor loss associated with shifting this risk among large companies (insurance companies and AFP's), particularly ones that are traded in the stock market. If it were desired to shift some of this risk to affiliates, there is probably no alternative institution than to have risk sharing with funds. However, there is no obvious case for allocating this risk to the affiliates rather than to the AFP itself or the insurance companies.

A private market also creates the incentive to police claims of death and disability. In contrast to a government disability insurance system where the determination of disability is potentially disputed by the government, here it is disputed by insurance companies, with the government having the roles of organizing rules for disability determination and the framework for dispute resolution. It may be that this structure will avoid the fluctuations in standards of acceptability of a disability claim that have plagued some government systems such as that of the U.S. In Chile, the Superintendency has had a big role in standardizing medical evaluations of disability by regional medical boards and the central appeals board.

4.3. Annuity market

4.3.A. Demand

Individuals accumulate their funds with an AFP until they (or their dependents if they die) are eligible to start receiving benefits. Eligibility can be achieved in a number of different ways. One is disability (if it happens before pensioning). Another is the death of covered spouse, father, etc. (if it happens before pensioning). Eligibility for a retirement pension is achieved by reaching the normal retirement age (65 for men, 60 for women). Eligibility for an early (also called anticipated) retirement pension is achieved at a younger age if a worker has accumulated an adequate fund, one such that the resulting pension is larger than both 50% of the individual's average taxable income during 10 previous years, and 110% of the minimum pension. There is no age limit for an early pension. Thus the rules for early retirement are meant to assure both smoothing of apparent consumption by the retiree and protection of the government from claims for a minimum pension.

It is not required that an eligible person start receiving a pension. The worker can choose between continuing to contribute and stopping contributions and starting a pension. When a pension is requested by an eligible person, the government forces the adoption of phased withdrawal if an annuity higher than the minimum pension is unaffordable given the balance in the individual account. When a pension is requested by an individual with sufficient funds, there is a choice to be made. The individual can contract with an insurance company for a real annuity. This annuity need not begin right away. However the government limits the structure of the allowable annuities to provide protection for spouse and children. The individual can choose a phased withdrawal of funds from the AFP. Under this option, the individual removes some money as a monthly benefit and leaves the remainder to accumulate with the AFP. The individual can change to an annuity at a later date.

Thus the annuity market involves two levels of competition. One level is between AFP's that provide phased withdrawal and insurance companies that provide annuities. The second level of competition is between alternative AFP's to handle the phased withdrawal and between alternative insurance companies to provide an annuity.

In the first level of competition, the formula for programmed withdrawal is important. It limits the maximum amount that can be withdrawn each month. Every 12 months, the fixed real amount that will be withdrawn in each of the following 12 months is calculated. This amount is $P = F/UC$, where F is the current balance in the individual account and UC is the unit cost of an annuity pension. The unit cost UC is calculated from the official life table and a "technical interest rate" (TR), and it is essentially the reserve needed to finance an annuity that pays \$1 per month when investments yield TR . The return TR in turn is calculated according to a formula fixed by law. This formula specifies that for AFP i , TR_i for year $t = 0.2 * (\text{Average of past real returns of Fund } i \text{ during the last 5 years}) + 0.8 * (\text{Average of implicit rate of return on all real annuities sold in calendar year } t-1)$.

Programmed withdrawal offers no insurance for longevity risk. This can be seen in the fact that if the pensioner fails to die in a give period, the funds F are depleted faster than the fall in UC due to reduced life expectancy. Simulations by Diaz (1993) show that a single male 80 years old who started withdrawals at age 65 would have a pension less than 50% of the initial pension if the technical interest rate predicts actual returns correctly²⁵. Since the phased withdrawal amount may fall below the minimum pension later on, such a person may end up collecting the minimum pension later. The technical interest rate formula has been criticized for being a backward-looking average that can differ significantly from current long term market interest rates. This can give rise to either excessive or insufficient withdrawal compared with the performance of the funds²⁶.

In the second level of competition, an individual with given demographic characteristics (including dependents included in the annuity) and a given level of fund solicits bids from insurance companies. Insurance companies might differ in their creditworthiness, and so the riskiness of their ability to pay the promised benefits. Insurance reserves are highly regulated to limit the extent of risk and, in any case, the government guarantees part of the annuity amount. One could imagine insurance companies differing in the quality of service to annuitants, although we are not aware of this being an issue.

Otherwise insurance companies differ only in the monthly benefit promised (and perhaps in the array of different annuity contracts, including some with a minimum number of guaranteed payments). Since each individual is quoted an individual specific price, the solicitation of bids is something that requires requests from each insurance company that a worker approaches (or the set approached on his behalf by his broker). While one might expect this to be market with a high degree of price competition, in practice, the competition seems to rely heavily on sales effort, which must reflect prices noticeably in excess of other marginal costs.

An industry has grown up of brokers to assist individuals in making their choices. Information on the numbers of brokers is shown in Table 19. This information and other descriptions about brokers is taken from a thesis on this topic²⁷. A problem with these numbers is that they include all brokers that participate in all branches of the insurance business, from casualty and liability to mandatory life. However, the growth in the number of brokers may be informative, since the growth in demand for retirement pensions is the primary change in this market. The market for brokers of real annuities is not concentrated. In 1990

²⁵Díaz, Carlos A. "Análisis Crítico de las Modalidades de Pensión y Propuesta Alternativa", Working Paper N° 156 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, 1993), pages 20-21.

²⁶Díaz, C.A. and S. Valdés-Prieto, "La tasa de interés del retiro programado: crítica y propuesta", Working Paper N° 149 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile, 1992) pages 27-38.

²⁷Frugone, J.P. (1992) op. cit. pages 27-32.

the largest individual broker intermediated 4.51% of all sales (in money terms) and the largest corporate broker intermediated 3.88%.

4.3.B. Supply

The existence of real annuities backed by private sector securities is something peculiar to Chile. Thus it seems useful to report the exposure of Chilean pension portfolio to inflation surprises, presented in table 24.

From the perspective of an insurance company, there are two risks undertaken when an individual annuity policy is issued. One is the risk of interest rates different from those used in calculation of the offered amount. This is an issue since there are not perfect hedging opportunities currently available in Chile, although they are improving. In February 1993 the Central Bank changed its policy and stopped issuing only 6, 8 and 10 year (indexed) bonds. Now it issues a whole set of (indexed) bonds with maturities at 4, 8, 10, 14, and 20 years. Over time, as the Central Bank turns over its domestic debt, the supply of long term instruments will improve. However, the annual issue of real annuities will treble in the next decade because of the maturation of the new pension system.

Second there is the risk associated with life expectancy. It is useful to think of this risk in three parts. One is the risk associated with projecting a life table for the entire population. The steady but unpredictable improvement in mortality that has gone on for a long time make this problem inherently risky. In the case of Chile this risk is compounded by the absence of a life table giving the historic experience in detail. Second there is the adjustment of the life table that is appropriate for the set of people who select annuities rather than phased withdrawal. In addition, there is a need to adjust the life table to weight by accumulated funds rather than lives. That is, insofar as mortality risk is correlated with income level (and so pension level), an unadjusted use of a single life table for all individuals will not be appropriate. Third there is the selection associated with the particular set of customers that an insurance company attracts. This reflects both measurable elements that are correlated with mortality, such as region or past history of disability, but also individually unmeasurable factors that are still relevant in the aggregate as a result of the pattern of selling behavior of firms.

The regulation of brokers is made up of two parts. One part affects the extent that accumulated funds can be used to pay for services up front, rather than paying only for the annuity. Since the insurance company converts the accumulated amount into an annuity, it is implicitly deducting any expense money, including the cost of sales personnel and payments to brokers from the accumulated fund. Thus, individuals are allowed to pay brokers out of their accumulation rather than out of pocket. The second part involves regulation of insurance companies, who must report commissions paid to brokers as expense, and thus must finance those commissions with equity capital rather than with the accumulation of annuitants.

4.3.C. Equilibrium

One way of measuring the extent to which these elements (and administrative costs) affect the equilibrium prices is by calculating the internal rate of return of annuities actually

sold. Of course such a calculation must be based on some life table. The government provides a life table and requires the insurance companies to report the average internal rate of return, based on this life table. Since brokers and salespeople are paid out of the accumulation, these numbers reflect all the costs in converting from an accumulated amount to an annuity. In Table 21, we show the rates of return that have been reported, two other interest rates in the Chilean economy and a spread between the internal rate of return and the market rate on the closest hedging instrument. The average spread in the last 18 months, after the last wave of entry, is 1.27%. As the life table is not checked to match the experience with those that choose annuities in Chile, and they may live longer than others, the expected spread may be smaller.

These numbers can be compared with those in Friedman and Warshawsky (1990), who compare the rates on 20-year U.S. government bonds and on corporate bonds directly placed with insurance companies with the IRRs on nominal annuities based on using life tables (adjusted for projected mortality improvements) for the population purchasing annuities, as measured by actual company experience²⁸. Friedman and Warshawsky report that for the period 1968-1983, on average, the IRR on the mean policy from the ten largest was 2.43% lower than the rate on government bonds²⁹.

Now we turn to the charges levied on pensioners. At present, the AFPs do not charge for programmed withdrawal operating a cross-subsidy with active workers. Presumably this will change when there is a higher ratio of retirees to workers, or else the charge to workers will increase. Even after fully developed, the market for phased withdrawals will have significant differences from the market for annuities. Cost-based arguments and the difference in charges between mutual funds and annuities in the United States suggest that the charges in phased withdrawals could be smaller than in the annuity market. However, the two markets may have different degrees of competitive pressure since one involves a single purchase while the other involves an ongoing relationship, with the opportunity to change provider. We do not have evidence as to which of these will result in lower markups. Drawing on the evidence that is available, we concentrate now on the cost of annuities.

This charge can be estimated indirectly by the spread discussed above. This spread includes fees for the insurance broker and/or salespeople. As the duration of newly issued annuities is close to 9 years and the average level of long-term real interest rates in Chile in the last two years has been close to 6.5% per year, the percentage reduction in pension benefits originated in the spread of 1.27 is 10.26% per year. To translate this into dollars, note that the average Chilean contributor reported an income of 325 US dollars per month in March 1992. As the contribution rate is 10%, and the flat commission is close to 0.34 dollars per month, the average contributor adds to the account at the rate of $[0.10 \times 325 - 0.34] = 32.16$

²⁸Friedman B. and M. Warshawsky, "The Cost of Annuities: Implications for Saving Behavior and Bequests", *Quarterly Journal of Economics*, (February 1990), pp. 135-154.

²⁹This gap varies from 0.80% in 1972 to 6.15% in 1981. The Chilean spread in the last 18 months is considerably smaller, but still larger than it was in 1972 in the United States.

dollars per month. As the average effective affiliate (the one that contributes at least once a year) contributes only 77.7% of the time on average, the average contribution from a life cycle perspective is only 25.0 dollars per month. Therefore, the dollar charge in the annuity option is 10.26% of 25.0 dollars, or 30.8 US dollars per year.

The published data report the total amount of commissions paid to brokers (independent) and to salaried salespeople. This does not include the salaries of salaried salespeople, only their commission income. These numbers are reported in Table 20. The information gathered in interviews with brokers and marketing people in life insurance companies by Frugone was that brokers received between 3.5% and 4% commission. During the first nine months of 1992, the average commission paid to intermediaries in annuities for old age, including early pensions was 454 thousand Chilean pesos, or 1,200 US dollars, which is close to 4% of the average premium³⁰. If 3.5% were a reasonable estimate, then $3.5/10.26 = 34\%$ of the total charge goes to brokers and 66% goes to insurance companies.

As the Chilean annuities market has not settled into a final form, it seems important to call attention on two problems that have appeared in similar markets. One is adverse selection, which in this case can operate because many workers are free to choose between programmed withdrawal and annuities. The second is excessive research on risk identification, which in this case means that companies may spend substantial resources in building life tables conditioned on the result of health exams and family history, and then seeking those that have the most favorable traits. These problems may emerge in Chile in the future, raising charges above the current levels.

4.4. Redistribution within a generation

Minimum Pension

The most visible element of redistribution in the Chilean pension plan is the provision of minimum pensions financed by general revenue. In considering this system, one should remember that the minimum provides the difference between the pension available from the mandatory accumulation with an AFP and the level of the minimum. This appears to be an implicit 100% tax on benefits. However, since there is little or no checking on incomes outside the AFP system, the disincentive refers to savings within the system, not a disincentive to any savings.

The minimum pension itself may not play a significant role in disincentives since mandatory savings for workers with high discount rates are largely a tax anyway. For example, for workers with a personal discount rate at least as high as that observed in the mass consumer credit market, which is higher than the interest rate earned by pension funds,

³⁰Revista de Seguros N° 97 (Santiago: Superintendency of Securities and Insurance, September 1992) p. 189.

the net present value of affiliation is strongly negative, as shown in simulations³¹. This implies that the labor market distortion is present in any mandatory pension system, even if the minimum pension does not exist. If these workers are dominant, the minimum pension is a method to help to the poor old at minimum fiscal cost³².

Cost Allocation

Distributional issues also arise in the treatment of the costs of running the retirement system. That is, the allocation of administrative charges in excess of marginal costs is a form of redistribution. Moreover, insofar as this is a mandatory system, one can do redistributions within the system by choice of cost allocations or by directly redistributing contributions³³. In the Chilean case, the most visible cost allocation is given by the equilibrium levels of the fixed and earnings varying commissions, which are below and above, respectively of the fixed nad earnings-varying costs. This implies that high earners are overcharged while low earners are subsidized, with AFPs in between.

Such redistributions do have efficiency effects, but these effects must be evaluated in the context of the other government imposed incentives. For example, if important segments of workers have a completely inelastic supply of labor to the formal sector, their wage income can be taxed in a variety of ways - for example to finance charges by AFPs and insurance companies - without loss of efficiency. However, in a longer term perspective in which training and education are flexible, high commission charges on top of forced contributions that are viewed as taxes will reduce the supply of labor to the formal sector.

More notorious in the short run is that such redistributions create incentives to individual AFPs to spend in salespeople oriented to high earners, who can be overcharged. This transforms part of the redistribution into costs. In addition, there is an incentive to create new AFPs to serve just high earners, and entry in this segment can proceed even if economies of scale are far from being fully used. This also dissipates part of the rent into costs.

4.5. Labor market

³¹Wagner, G. (1991) op. cit. page 74.

³²It seems useful to mention one implication of the minimum pension for a rational worker who anticipates receipt of a minimum pension in all years. For such a worker, the choice of AFP should be based solely on the goal of minimizing out-of-pocket expenses. These workers would not care how high the other charges were.

³³For example, Michael J. Boskin, Laurence J. Kotlikoff, and John B. Shoven,, "Personal Security Accounts: A Proposal for Fundamental Social Security Reform", in Susan M. Wachter, ed. Social Security and Private Pensions: Providing for Retirement in the Twenty-First Century (Lexington, MA: Lexington Books, 1988), pp. 179-206, consider a mandatory savings system that includes a redistributive element.

In considering the impact of this system on the labor market, there are several dimensions that one needs to examine. We consider only workers earning enough so that the minimum pension is not relevant. From the perspective of an individual worker, there is a tax on earnings in the covered sector equal to the tax rate plus the commission charge less the perceived value of the future (and current insurance) benefits. It would be difficult to figure out how much of the tax plus charge is offset by the perceived benefits for different workers. Naturally the offset is based on the expected value of the future income to be received, adjusted by risk. For a worker who would have saved the same amount anyway, and has the ability to rearrange his voluntary wealth to achieve the desired overall portfolio mix, the difference in the costs of carrying out the savings through AFPs or otherwise is an adequate measure of the implicit tax.

The issue becomes more complicated once one recognizes workers who do not value future income highly enough to be saving at at least this level. If we model myopic individuals as having very high discount rates, then current taxes that will be returned with 4% or 6% returns in the distant future are worth very little when the discount rate is at the levels of consumer interest rates, for example 20% (Valdés and Cifuentes, 1993). Without trying to select a particular set of discount rates, we simply refer to the net tax and discuss its effects.

The presence of a net tax affects the choice of hours, the choice of whether to be in the labor force, and the choice between covered and uncovered sectors. Presumably, the tighter tie between benefits and taxes of a contribution-based system than is common with benefit-based systems and the greater transparency of the former imply a lower net tax and so less of a distortion. However, if segments of consumers are high discounters this may make little difference. We are not aware of any empirical work contrasting different systems and suspect that such work would be difficult to do. In any case, it may be illustrative that in Chile independent contributors do not favor the new over the old system, as seen by the numbers that choose each, reported in section 2.

Since individuals can claim benefits once they are eligible based on age or adequate accumulation only, there is no linkage between pensioning and retirement. This is in contrast to systems that condition benefits on low or zero earnings, which generate substitution effects on labor supply. On the other hand, the lack of such linkages implies a lack of insurance for short working life, a form of insurance that makes use of measurement of actual earnings at retirement age. It is unclear how important this additional element of insurance would be in light of the fact that the minimum pension provides some insurance of this kind and already provides a disincentive to work through the lack of return on further accumulations. More generally, the ability to use an earnings test and the ability to redistribute accumulated amounts to lower earners (or short career workers) depends on the ability to measure earnings throughout the economy, an ability that may be lacking in economies that have large informal sectors. In Chile the government has always been unable or unwilling to prevent work by pensioners after retirement.

However, when the pension reform eliminated linkage between pensioning and retirement, it changed the legal rules that govern severance payments. In the old system, pensions originated from either age or years of service, plus the requirement of showing a certificate of cessation of employment. This forced workers in the formal sector that wanted a pension to quit voluntarily and loose severance payments. Although in practice a pensioner could go on working elsewhere, this limited severance payments and forced job rotation at the age of retirement in the formal sector. With the reform, cessation of employment ceased to be a requirement for obtaining a pension, except for employees in the civil service. As this interaction with the labor law was overlooked, this change raised the cost of severance payments for employers - except the government - and reduced the incentives to switch jobs at the date of pensioning in the formal sector. The associated substitution effects are excessive duration of the working life in the formal sector and increased unwillingness of employers to hire older workers.

4.6. Performance and regulation of the investment function

The very high real rates of return earned by the AFP's (shown in Table 22) have attracted attention. In order to evaluate these high returns, it is important to place this performance in comparison with market interest rates. Research by Walker (1991a, 1991b) has found that, as expected, Chilean AFPs almost never do better than a buy and hold strategy would allow³⁴. Therefore, the high returns exhibited by pension funds reflect high returns in the Chilean economy generally.

One should ask if the historic returns are sustainable towards the future. The answer can be gleaned from the yield curve observed today in the Chilean market for long-term CPI-indexed bonds, because AFPs can lock in those returns just by purchasing and holding those bonds. The forward rates observed today are close to 6.5 % real for the next four years, falling gradually along the yield curve to a level close to 5.5% real in the period from 16 to 20 years from now. Adding some risk premium earned in equity investments, a 7% real rate is reasonably expected by Chilean analysts. These returns are higher than the sum of population growth (1.6% now, falling significantly in the next 20 years) and real wage growth (in the 3-4% range). These returns are significantly higher than those that can be obtained currently in the OECD because investment opportunities in Chile are good and relatively risky, while international capital market integration is limited. One way of reducing volatility for PF's is through investment outside Chile, which is expected to grow in the next years.

It is worth noting that Chilean AFPs obtain market returns, after adjusting for nondiversifiable risk and for the effects of the investment limits that affect them. This result is

³⁴Walker, E. (1991a) op. cit. page 29; and Walker, E. (1991b) "Desempeño financiero de las carteras de renta fija de los fondos de pensiones: es desventajoso ser grande?", Working Paper N° 136 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile), pages 27 and 29.

superior to that observed often in the United States and the United Kingdom, where the median pension fund consistently underperforms market indices³⁵.

Walker (1991b) does find that different AFPs choose significantly different equity portfolios, with different exposures to systematic risk³⁶. Zúñiga (1992) finds that a substantial part of differences in return in equity portfolios over 1988-90 can be assigned to the differential impact of portfolio limits on funds of different sizes³⁷. Still, the hypothesis that one particular middle-sized AFP had special abilities regarding fund management could not be discarded. Thus we reach the unsurprising conclusion that most AFPs do not add substantial value by applying special abilities in their investment strategies, but rather do so by offering transaction and record-keeping services to affiliates.

The differences between pension funds along the risk-return frontier are limited by the incentives caused by a special regulation, which forces AFP's to post a guarantee bond to assure that the ex-post difference in return between their fund and the average of all the funds is less than MAX (2%; 0.5 average return ex-post) in real terms, measured every month for the last 12 months. This regulation gives a very large incentive to AFPs to hold portfolios that are "close" to each other. As the sum of pension funds hold the market, and the market belongs in the risk-return frontier, this regulation also induces individual AFPs to move towards the risk-return frontier.

Affiliates seem to choose among AFPs according to the ranking of past returns. The public seems to have insufficient awareness of the tradeoff between risk and return. We note that the Superintendency does not arrange for a report on the standard deviation of past returns, so a ranking among AFPs in this dimension has never been reported to affiliates.

Chilean pension funds are subject to a variety of portfolio limits defined in the law. These are maximum investment limits. There are no rules requiring a minimum investment in designated securities, except minimum rules that flow by subtraction. For example, until 1992 the minimum investment in Chilean securities was 100%, since investment abroad was banned.

Portfolio limits serve several purposes. Some are aimed at protecting affiliates, others are aimed at protecting the markets in which AFP's buy and sell. For example, equity holdings in Chilean companies is limited to 30% of the portfolio. For another example, no AFP can purchase more than 20% of a bond issue. For another, AFPs can only invest significantly reduced amounts in securities issued by companies affiliated to the AFP. Another prevents dominance of any individual AFP in the shareholder meetings of a public company, by limiting shareholdings to 7% of outstanding equity. Other regulations ban

³⁵See Lakonishok, J., A. Shleifer, and R. Vishny, "The Structure and Performance of the Money Management Industry", BPEA: Microeconomics (1992), 339-390.

³⁶Walker, E. (1991a) op. cit. pages 16-17.

³⁷Zúñiga, F. (1992) op. cit. pages 67-71.

equity investment of pension funds in other AFPs, insurance companies, mutual fund management companies and stockbroking companies. Regulation in this area is still evolving. A new proposal would limit the investment of a pension fund in equity issued by each individual company to a number that is a function of a liquidity factor, an ownership concentration factor and a ratio that measures the share of productive assets that are held directly by the issuing company and the volume of accounting information its subsidiaries have agreed to disclose.

Life insurance companies are subject to similar portfolio limits. In addition they are subject to solvency regulations that limit their maturity mismatch.

4.7. Impact of fund accumulation on the capital markets

The growth of pension funds managed by AFPs and the investment reserves of life insurance companies has been substantial. Table 23 shows the holdings of pension funds alone. The pension funds hold a substantial share of domestic public debt, which increased significantly in size during 1990 and 1991. This public debt was issued by the Central Bank and invested in foreign currency reserves. The existence of fiscal balance during the last 5 years has implied no issue of domestic debt by the treasury. The large increase in the equity share in pension portfolios between 1990 and 1992 was not due to large purchases by the pension funds, but to a 279 % real increase in stock prices (IPSA index). This in turn appears to be due to a large reduction in the country risk premium and international arbitrage. Large increases in value when a market is integrated into the worldwide capital market are common³⁸.

Although it is impossible to prove that share prices did not rise in response to expected future purchases by pension funds, this hypothesis is doubtful. First, share prices rose so much that several pension funds violated their portfolio limits by much more than the existing 3% allowance and some were forced to sell. Second, the prices of stocks that can and cannot be purchased by pension funds rose similarly. Real estate prices also boomed, even though pension funds cannot buy in appreciable amounts. Third, when a law that would relax investment limits for pension funds was proposed in January 1993, the stock market rose by 12%, suggesting that such laws had not been fully discounted previously. On the other hand, experience has shown that when pension funds are allowed to buy an individual share for the first time, its price rises in the 10-20% range before pension funds are able to purchase.

There have been two main impacts of pension funds on the capital market. First, the large volumes invested have justified increasing specialization and the creation of new financial markets. The best example is the long-term corporate bond market, created in 1988-89, where most of the demand comes from pension funds and life insurance companies. Others are the appearance of a second stock market in Santiago, and the creation of an electronic

³⁸Elaine Buckberg, "Emerging Stock Markets and International Asset Pricing", unpublished (Cambridge, MA: Massachusetts Institute of Technology, 1992), Table 2.

Central Custody. Of course, many developments in the Chilean capital market would have occurred anyway, even without pension reforms. For example, during 1992, a substantial number of medium-sized companies have gone public and issued shares. This development appears to be driven by the 1991 increase in price/earnings ratios to international levels.

Second, in a small developing country, the introduction of private pension fund management makes imperative additional reforms to assure transparency and efficiency in the financial markets. In addition, the growing volume of funds may stimulate the authorities to improve regulations to facilitate the appearance of new financial instruments. Both of these changes endow the economy with "institutional capital", which improves the operation of the voluntary capital market, yielding a positive externality³⁹. Examples of changed regulations include regulations forcing controlling shareholders of public companies to report on their share transactions (1986), introduction of risk classification agencies for bonds (1987), introduction of closed-end mutual funds (1989), solvency regulations for life insurance companies are extended to consider exchange risk (1985), bans insurance companies from investing in the securities issued by affiliates (1987), creates new variety of mortgage bonds (1988), and adjustment of solvency regulation to consider duration mismatch (1989).

One aspect of the Chilean capital market that has been essential for pension reform is the development over 1974-78 of a legal framework that permits the issue and purchase of a full range of CPI-indexed debt to all market participants, including banks, firms and households. In Table 24 we report on the vulnerability of pension funds to inflation surprises. The tax collection system was also indexed in 1974, so real tax revenue apart from seigniorage is almost independent of the inflation rate and the government can issue indexed bonds safely.

³⁹Valdés-Prieto, S. and R. Cifuentes (1990) "Previsión Obligatoria para la Vejez y Crecimiento Económico", Working Paper N° 131 (Santiago: Instituto de Economía, Pontificia Universidad Católica de Chile), pages 39 and 44.

4.8. Government guarantees

In the description of the pension reform, we have mentioned a number of government guarantees. In this section, we bring them together to make clear their overall role.

First, for the event where the life insurance company that sells a pension system annuity becomes insolvent, the government guarantees first 100% of the value of the annuity, up to the level of the minimum pension, and second, 75% of its value above the minimum pension. In addition, implicit government guarantees may exist because of the mandatory nature of contributions and the fact that the solvency of life insurance companies is regulated. The only test up to now was the case of a medium-sized company that went bankrupt in 1984⁴⁰. As prescribed in the law, pensioners absorbed part of the loss, and the government has absorbed the rest with little pressure for more guarantees.

After this experience solvency regulations on life insurance companies were improved in 1987 and in 1989. Currently, the regulation of insurance reserves limits the debt/equity ratio of insurance companies to 15, but they usually operate with a ratio near 10. As it is very unlikely that an insurance company can loose more than twice its capital without the authorities taking over it, an estimate of the maximum loss to annuity holders is $(\text{Loss-capital})/\text{Debt} = (2-1)/10 = 10\%$ of their promise. This means that the government guarantee is more likely to be called by those pensioners whose annuity is less than 1.10 times the minimum pension.

As explained before, a regulation forces AFPs to post a guarantee bond to assure that the ex-post difference in return between their fund and the average of all the funds is less than MAX (2%; 0.5 average return ex-post) in real terms. The government guarantees this (stochastic) floor return in case the deviation in rate of return exhausts the posted guarantee. If there is a shortfall, the AFP must draw funds from its guarantee bond, which has a size of 1% of the pension fund it manages. In addition, it must replenish the guarantee fund within 15 days. If it does not its license is revoked.

The guarantee will involve government funds only if this bond is inadequate. Given the monthly frequency of evaluation, this is an unlikely event. In part, the event is unlikely because this regulation gives a very large incentive to AFPs to hold portfolios that are "close" to each other. Up to 1992, the guarantee bond had been called twice, and the government guarantee has never been called.

The third guarantee involves the minimum pension. The risks in both the rate of return and longevity are shared with the Treasury for workers choosing a phased withdrawal. As the risk of longevity can be diversified away if the lifetable is correct, the treasury bears only the investment risk. For those that have chosen an annuity, an increase in the legislated

⁴⁰Frugone, J.P. (1992) op. cit. pages 95-98.

minimum pension may force the Treasury to pay the difference between the purchased annuity and the minimum pension.

4.9. Political economy of pensions

Consider a fully private pension system. The consumption levels of people who rely on this pension system for (at least) part of their consumption will depend on the rules and functioning of the pension system and the government treatment of such income. One would expect that the government would treat such income similarly to other incomes in the economy. That is, in times of government financial need, there would be an increase in taxation of such income, in keeping with the increase in the taxation of other incomes. If government times are sufficiently hard that wealth as well as income is subjected to increased taxation, that should presumably extend, at least somewhat, to the wealth represented by pension accumulation. There would be no reason for the government to single out the particular good or bad health of this system as a reason for increased or decreased taxation (or implicit taxation), although any private institution in sufficient financial difficulty has an incentive to try to get the government to bail it out⁴¹.

In contrast with this pattern, consider a pension system the finances of which flow through the government budget. In governmental hard times, there will be a strong impulse to cut benefits in excess of the cut of incomes generally. If the system appears particularly healthy, there will be a temptation to tap the resources for other spending, with the possibility of adjusted promises to the recipients. Thus the excessive growth of pension promises is often triggered by the ease of financing temporary increases that are then legislated as permanent increases. The question here is whether the financing of PAYG pensions should be subject to the same vagaries of overall need as other government expenditures or instead treated like other sources of income.

Posing the question in this form raises the question of the extent to which government expenditures ought to vary with the fiscal health of the government. Presumably the answer should depend on the degree of intertemporal substitution in the services provided by the different government expenditures. Pensions have little intertemporal substitution since the recipients themselves may have little elasticity of substitution and some of them will die before such a change may be reversed. Moreover limited access to credit markets may make recipients particularly sensitive to changed timing of benefit payments. In contrast, both some public consumption and some public investment may suffer little from retiming.

As a matter of political economy, all of the government budget has a strong tendency to move together. This makes it appropriate to set up a pension system to be less subject to the vagaries of temporary budget position. This can certainly be done by the type of privatization done by Chile. Somewhat it can be done by a partially funded system as in

⁴¹The desire for a bailout was part of the encouragement of the formation of the PBGC in the U.S.

the US. Possibly it can be done by earmarked revenues provided the flow of funds is suitably automatic⁴². The record in Latin America suggests that this can not adequately be done by the typical Latin American pension system in the setting of Latin American politics. In Latin America, there have been both kinds of abuse - excessive sensitivity to the state of the government budget and excessive sensitivity to the state of the short run finances of the pension system. If a privatized system is expensive to run, then, from the perspective of the workers, the question becomes one of describing the benefit cost calculation of political insulation relative to administrative costs. It is also appropriate to attempt to assess the degree of variation in both insulation and administrative cost as one varies the degree of both privatization and individual choice.

It is interesting to consider how the value of insulating DI and SI from the political system is different from that of insulating the retirement income system. Both types of political abuse seem readily available for DI, less so for SI. Since DI includes a determination of disability, where standards are necessarily imprecise, the standards can easily fluctuate with political interests and short run fiscal needs. In the U. S., we saw people removed from the DI rolls under the Reagan administration who were then restored by court order. In several Eastern European countries, DI is used in a discretionary fashion as a substitute for long-term unemployment insurance. These policies are less sensitive to political alteration in a setting where DI claims are at the cost of private insurers, with annually adjusted insurance premium charges set by the insurance companies.

5. LESSONS FROM THE CHILEAN EXPERIENCE

We have organized this section into four parts. The first part highlights some aspects of the Chilean situation at the start of reform and experience under reform which are relevant for countries considering adopting a basically similar structure. The second part proposes some reforms in the Chilean context. In addition to their possible relevance for Chile, this discussion carries the discussion in the first part somewhat further. In the third part we consider possible major changes in the Chilean system, while preserving the basic characteristics we consider to be most valuable. The concluding part considers the more basic question of the choice between a funded/privatized system, as in Chile, with a more traditional system organized around a benefit formula, as for example, in the US.

5.1. The Chilean reform as it stands

As shown in the analysis, the Chilean reform includes two reforms: a shift to funding and privatization. It is possible to think of other reforms where privatization is kept while a shift to funding is avoided. In this section we discuss the full package as applied in Chile.

⁴²One does not hear much of short-run budget difficulties in the administration of Central Banks which have direct access to seignorage revenues.

Fiscal issues in the shift to funding

For a country with an existing underfunded social security system that is to be replaced by a fully funded system, there are major fiscal implications of such a change. The tax revenue currently flowing into the government that is used (at least in part) to finance the existing system will flow instead into individual accounts. Thus there will be a sharp fall in government revenue, without much change in the call on government expenditures in the short run. This was illustrated in Table 12 which shows the deficit in social security expenditures that Chile experienced. The full impact of the change is smaller than appears since a fraction of initial mandatory savings will naturally flow into government debt.

In considering the Chilean context and success, it is perhaps important to recognize that the Chilean government budget was put in significant surplus in preparation for the reform (although the crisis of 1982 put the government budget into serious deficit shortly thereafter). This surplus could have been used to finance tax cuts or other expenditure increases. Instead it was used to fund the social security system, i.e. to increase public saving to retire hidden pension debt.

In a country considering a shift to funding in the absence of such a surplus, the credibility of the required future increase in the primary surplus in the government budget may be put into question. If adopted by a country with a significant deficit, this reform adds considerably to the deficit. This may make the politics of reform much more difficult than with the Chilean approach of building the surplus first. The presence of a large deficit will create an incentive to abandon the funding goal and restrict the reform to privatization. This may be done in ways that undermine the privatization goal, for example by restricting the investments of PF's outside government debt and forcing AFP's to accept government debt paying less than market rates, as in the Philippines⁴³. After such a start, the political support for the development of a privatized system as a route to an insulated pension plan may be seriously undercut. It may be possible to privatize without shifting to funding, but this route is yet to be tried⁴⁴.

The growth of the Chilean economy was accompanied by very high interest rates across the board. No doubt these high rates of return contributed to the popularity of the system with workers. One can wonder what would have happened had the rates been low instead. In a Chilean-style reform, workers bear the investment risk. It is our guess that a period of low returns in Chile in the near future would not generate irresistible calls for government contributions to pension (although it would increase the cost of the guaranteed minimum pension). However, in a system without such a history, one can wonder about the

⁴³Rigoberto Tiglao, "Pinched Pensions: Government Institutions Called on to Help Philippine Cash Squeeze", *Far Eastern Economic Review*, N° 48 (29 November 1990), pp. 48-49.

⁴⁴For example this could be done by replacing at the outset all implicit pension debt by explicit public debt in the form of perpetual bonds, putting them in Pension Fund portfolios and allowing AFP's to trade an rearrange portfolios.

political economy of this risk. On the other hand, partial government guarantees to the rate of return during the initial years may be very costly and undermine the privatization side of the reform.

Financial regulation

Considerable regulation of financial markets and financial intermediaries is a worldwide phenomenon, for good reason. In the Chilean pension system, there is need for regulations involving the soundness of the investment policies of two types of financial intermediaries - the AFP's and the insurance companies. Since large amounts of wealth are being accumulated under this system, there will be considerable incentive for taking advantage of these intermediaries. These range from furthering outside investment issues to outright embezzlement. As witnessed by the continuing development of capital market regulation in advanced countries, and spectacularly visible periodic failures of regulation, these are not simple issues⁴⁵. Thus, it is clear that a country that undertakes a Chilean-style reform must strive to improve substantially its regulatory establishment.

On the other hand, the Chilean experience is that reform can be started without having a sound regulatory structure in place. Modern bank supervision started in Chile in 1980, just as the pension reform was adopted, and began to operate strongly only in 1982. The reforms to the securities and corporation laws were passed in 1981. Later, during the 1980's and 1990's, financial reform occurred at several points in time, many of them in response to the growth of pension funds.

Thus, it seems to us that there are two necessary conditions for a successful imitation of the Chilean experience with regulation. First is a commitment of strong political support for continued regulation. The Chilean banking collapse, coming soon after the social security reform, may have added to the strength of the political will to continue tight regulation. Second is a close fit between the allowed investment instruments and those supplied safely by the local capital market. On this point, it seems to us that Chile compensated to some extent the risks of starting its pension reform without a solid background in financial regulation, with the imposition of stiff restrictions on the initial allowed portfolio, which was limited essentially government debt and bank deposits. Over time, portfolio choice can be expanded as financial regulation is improved.

⁴⁵Securities and Exchange Commission, *Protecting Investors: A Half Century of Investment Company Regulation*. (U.S. Government Printing Office, May 1992) 525 pages.

Expense

In Chile, the administrative expenses associated with the new system probably exceed those of the old system, even though the old system was viewed as expensive because of its fragmentation and history of political appointments. Thus it is important to recognize that these expenses are part of the cost of adopting such a reform. In addition, the expenses may be higher than they would be under other reforms. We will say a little more about this below when we contrast the Chilean approach to a more standard benefit based system.

5.2. Further Reform in Chile

The Chilean social security system has been subject to nearly continuous reform and revision. Here we comment on some of the possible reforms.

Indexing of Assistance and Minimum Pensions

Promises to index state pensions at some long-term level are not credible, unless insulation from the annual budget process is achieved by some radical means. However, the issue of month-to-month indexing is still important. In Chile, the only pensions whose real value is left to vary with monthly inflation, in between cost of living adjustments, are those with redistributive character and those in the old system. If the old, invalids and survivors are considered to be less able to substitute current for future consumption, and this explains why phased withdrawals are indexed monthly between recalculations and why only indexed annuities are authorized, there seems to be no reason to exclude the poorest among the old from the benefits of monthly indexation. Although this policy would fix real expenditure in assistance and minimum pensions, the tax system in Chile yields revenue that is quite independent from inflation, so this reform would not increase the risk of a fiscal crisis.

Regulation

It appears that the costs of the Chilean system can be reduced by improving the design of existing regulation. In some areas additional tightening seems desirable. For example, the 1988 authorization to AFPs to issue voluntary savings accounts has resulted in offer of these services at zero price, so the observed volume of these services is above the socially optimal one. The prospect of zero prices led politicians to entrust AFPs with additional tasks, such as the management of individual accounts where the employer deposits for severance payments (1991) and maybe other accounts where the employer deposits for unemployment insurance (under discussion now). One effect is that overall administrative charges rise too much because excessive production of zero-price services. In other areas, regulation seems excessive. For example, the Superintendency specifies in detail how many administrative functions must be performed, leaving too little scope to cost minimization by firms.

Clearinghouse

Under the old Chilean system, the government collected payroll taxes for pensions along with other taxes (including payroll taxes for health benefits). The privatization of mandatory savings has meant that the government ceased to play a direct role in collecting the forced savings contributions. At present each AFP collects its own contributions separately, and many of them have service contracts with banks, so indirectly they have access to the bank clearinghouse. However, the cost and nuisance to the employer of making payments to multiple AFP's still remains. This has been reported as leading some firms to encourage their workers to all select the same AFP.

One would expect that the payment of contributions by employers would have increasing returns to scale in the sense that each employer would prefer to make payment to a single agency than to several different AFP's and in the sense that the need for AFP's to check on the payments by employers would be cheaper for AFP's if checking were done by a single agency per employer, rather than separately by many AFP's. There may or may not be gains from having a single collection agency in each region, rather than several in each region, although the former would probably be simpler for the AFP's to deal with. It is not apparent to us how large a region would cost minimize the sum of costs of single collection agencies per region. Centralized record-keeping may also be convenient, although computerized transfer of information is not very expensive.

To date no such collective arrangements have emerged in Chile, even though they would reduce costs for AFPs as a group. Two explanations are that AFPs are reluctant to set up institutions that might result in the sharing of information on their clients, or which would make expertise on collection available to entrants for free. Another possibility is inertia. Thus there seems to be a role for the government to encourage the AFPs to set up a clearinghouse or some other institution. If a clearinghouse were created it could also collect health insurance payments. In addition, it might be employed by the government for the collection of withholding payments on taxes. Such a clearinghouse should perhaps be owned by the AFP's (or the AFP's along with other users) to prevent the exploitation of monopoly power (New entrants would be allowed to join as owners at a suitable fee). The clearinghouse should probably not be allowed to make a profit for its owners, so that it does not become a vehicle for collusion.

Information and fees in the annuity market

There is concern that the startup of the annuity market is associated with very high transaction costs. In particular there has been concern about the level of fees charged by advisers to people selecting annuities. The startup of any new activity often has high costs to customers until competitive forces are in full force. However, as long as workers continue to be relatively improvident and uninformed so mandatory contributions continue to be necessary, totally free selection of annuities may continue to be expensive and subject to large fees. It is natural to explore alternatives to reduce these costs.

Grouping for annuities

Purchase of an annuity, like selection of a fund manager, is designed to be on an individual basis. This is in contrast with the provision of both disability and survivor insurance which are done on a group basis by the AFP's. It is also in contrast to the use of employer or union based private pensions systems in much of the world. There the economies of scale associated with group purchase are exploited⁴⁶. It is natural to ask whether an optional group purchase of annuities could not be introduced to offer a low cost alternative to workers and to increase competitive pressure to hold down costs on individual purchases. If such an institution can be successfully designed, then it would be natural to ask whether similar grouping might not be helpful for AFP selection.

In considering group formation, one approach would be to use employment as a basis for group formation and have employers involved in the process. A different approach would have the government form the groups based on all individuals reaching retirement age during that month⁴⁷. Regardless of the identity of the group sponsor, one problem is that a supervisory machinery must be put into place to make sure that insurance companies cannot influence the bidding outcome through bribes or campaign contributions.

Discretion may be reduced through regulation. For example, each period the sponsor might form a group based on individuals in the group reaching retirement age that period plus individuals announcing that they are considering an early retirement (with such an announcement allowed only once). The sponsor would solicit bids on this group each period. Thus everyone would receive a group quote before being allowed to accept an individual arrangement. A bid would necessarily be a formula for converting accumulation, age, and age of dependents into a benefit level, with the formula the same for everyone in the group. A board of trustees named by the sponsor must select one supplier for each group. This is tricky since the formula is not a scalar that is easily compared. But, the sponsor could be obligated to use a formula which is a weighted sum of benefits assuming everyone took a pension as the criterion for selecting a particular insurance company. The weights might be kept secret to limit adverse selection and gaming. Since there is no compulsion either to bid on a group nor to accept an annuity from the group, this does not seem politically

⁴⁶For example, it appears that in the U.S., individual choice of mutual fund is roughly three times as expensive as group choice. This tentative conclusion follows from comparing average fees for individual mutual funds of roughly 1.5% of assets with a figure of roughly 0.5% for investment management fees. The conclusion is tentative since the latter figure does not include the keeping of individual records provided by the employer. The first figure is from Erik R. Sirri and Peter Tufano, "Mutual Fund Services: Supply and Demand", unpublished paper, Harvard Business School, Cambridge, MA August 1992. The second figure is from SEI Research Reports, vol. 6, N° 4 (December 1990).

⁴⁷For a presentation of such an approach for health insurance, see Peter Diamond, "Organizing the Health Insurance Market", *Econometrica*, vol. 60. (November 1992), pp. 1233-1254.

unacceptable. There are two compulsions. One is to request the group bid before making an individual purchase. The second is that an individual can only be part of a group once.

Multiple Funds

At present each AFP is restricted to manage a single pension fund. Allowing AFP's to have a short menu of alternative pension funds that were clearly labeled is an alternative. There might be two, for example, labeled high risk and low risk. One advantage is that workers would not be forced to switch AFP when they are dissatisfied with the current portfolio chosen by their AFP, as they could merely switch funds within the AFP. As different funds would charge different fees for fund management, in addition to the fees charged by the AFP, there would be a transition period in which most workers may find it harder to choose among funds and among AFPs. However, in the long run this reform should make choice easier than today, since AFPs would be compared on a commission for service basis while funds would be compared only on a risk-return basis. This means that another advantage is that marketing expenditures may fall in the long run.

5.3. Options further away from the Chilean model

Fund Management

The Chilean system is based on private management of accumulated funds⁴⁸. The Chilean system is also based on individual choice of fund managers. However, privatization of the demand side seems to be associated with substantially higher administrative and selling costs, as seen in Chile and in financial markets elsewhere. One alternative that would greatly reduce these costs would be to preserve private management of funds but to eliminate private choice of fund manager. This could be done by having two (high and low risk) aggregate funds (or a few), with individuals having individual accounts with the aggregate funds. This would require the government to be placed between the individual accounts and the fund managers. Private fund managers would bid on managing parts of the aggregate fund. Incentive contracts could be designed for these fund managers.

This approach would put great power in the hands of the selectors of the fund managers. Therefore, this option requires a well insulated, carefully audited and transparent institution to fill this role. Such a public institution would need a high degree of independence from the political process, that lied somewhere between the independence achieved by some central banks and the independence of private firms. This may be an impossible target in some countries. Political parties or the military would naturally control nomination to these boards. It should be noted that a board that evaluates the performance of

⁴⁸Although a privatized system requires full funding from an individual's perspective, we can expect part of these funds to be invested in government securities, so privatization admits partial or little funding from an aggregate perspective.

portfolio managers has to choose first the overall allocation of the portfolio, which implies choosing sectors to invest, and has to design performance indicators which may bias investment towards preferred companies. In the end, in some political settings the risk of mismanagement may increase and the value of pension promises may fall with this approach.

The Chilean system is based on individual choice by the worker. Again contrasting this approach with the workings of some parts of private pension systems in the OECD, one could consider instead placing the choice of AFP in the hands of an employer. This could be restricted by allowing workers to have multiple accounts that are only consolidated at the time of retirement. Thus an employer would choose an AFP for the complete set of workers in the firm's employ. Workers would have the option of leaving their previous accumulation with the AFP that held them previously or combining the accounts in the AFP chosen by the employer. There is no reason to think there would be more of a problem with placing the choice of AFP in the hands of the employer than there is in having private pensions designed by employers, as in current practice in the OECD. The requirement for this arrangement to work is that the employer finds it more profitable to act in the best interest of its employees than to seek compensation from the fund managers that it chooses, at the expense of workers. This requirement implies a machinery of surveillance and that the reputation of being a good employer be of substantial value, both of which are costly.

Timing of Annuity Conversion

At present workers convert their accounts into annuities at a single time. This holds down the administrative costs that would be higher with repeated purchases. In addition selling costs might be higher with repeated purchase, although the selling costs associated with repeated small purchases are not necessarily higher than those associated with a once and for all large purchase. Another aspect of a single purchase time is that workers are subject to considerable risk from possible fluctuations in interest rates in the long term market at the time that they make their single large purchase.

A different route might be to convert contributions into annuities on a continuous basis. This is similar to a proposal made by Boskin, Kotlikoff, and Shoven for the US⁴⁹. In order to have a functioning market, insurance companies would have to change the nature of pricing. At present price quotes are individually tailored to individual requests. This involves an allocation of costs to individual retirees. One could, instead, require firms to produce prices per peso of accumulation converted into an annuity from a planned retirement age. In this way one could allow the conversion of the actuarial value of the fund in the event of death before retirement into annuities. A particular worker would have to purchase a package of annuities over spouse and children as well as himself.

5.4. Comparison between a privatized and a conventional pension system

⁴⁹Boskin, Kotlikoff, and Shoven, (1988) op. cit.

The Chilean system is built around mandatory savings and is thus similar to defined contribution private pension systems. Commonly social security systems are designed around benefit formulas. Another central feature of the Chilean reform is the replacement of government provision of benefits by multiple private providers, with private choice of provider. In this section we want to raise some of the issues associated with this basic choice. We divide our topic in three sections: politics of initiation and foreseeable changes, politics of the response to shocks and insurance implications.

5.4.A. Politics of initiation and foreseeable changes.

There is a natural division of the decisions in the creation of a social security system into three parts. One part is the pattern of intergenerational redistribution. A second part is the pattern of intragenerational redistribution. A third part is how well the technical details can be made to work, and are made to work.

Intergenerational redistribution

Redistribution policy is usually intermingled with benefit design in conventional pension systems. Instead, contribution-based systems tend to isolate and make explicit the redistribution. This difference shows up in a difference in the agenda for legislation and has real effects, both on economic outcomes and on the understanding of the effects of policy. This may improve or worsen outcomes, depending of the workings of the political system and on one's perspective. Let us consider two examples.

First, when initiating a social security system when there isn't one (or there is one that gives small benefits), a critical question is what to do about those currently retired or close to retire. Either type of pension system can redistribute towards this group. However, the two systems have different natural presentation of the issues and so tend to different political outcomes. With a contribution based system, redistribution requires transferring assets to the accounts of older workers and retirees, which requires identification of financing sources. With a benefit based system redistribution is more implicit, as it is achieved by applying the benefit formula to people that have less than full contribution histories and financing is left in the background. As the system builds up its foreseeable fund after initiation and exhibits a "short"-run cash surplus ⁵⁰ political pressure to redistribute to current retirees arises. This pressure is much larger with a benefit-based system than with a contribution based system, since the people financing the transfer in the latter are currently present and more visible (as opposed to absentee "future generations" in a benefit based system).

A third instance when there are foreseeable consequences is when a demographic transition is coming. The two systems have different incentives to manage a demographic transition. With a benefit-based system, there is a need for good management by the political

⁵⁰The "short" run may be twenty to seventy years, depending on demographics and design.

process. For example, if a benefit based system operates on the PAYG principle, demographic shocks require substantial foresight to change contribution rates, introduce partial funding and increase retirement ages 20 or more years in advance. In a contribution based system, part of the adjustment to a demographic shock is automatic as retirees accumulate for their own retirements. There may also be changes in asset prices as the transition happens or as it is increasingly foreseen.

Intragenerational Redistribution

There are three issues that arise here. One is explicit provision for the poor. A second is implicit general redistribution, and a third is benefit seeking by special groups.

Again, benefit-based systems tend to produce implicit redistribution, while contribution-based systems are more explicit. An instance in which explicitation turns out to be bad for the poor can be seen in Chile, regarding indexing clauses. In Chile provision for the poor (those within the earnings-related pension system) is done through the minimum pension⁵¹. The minimum pension is financed out of general revenues. As this pension is not indexed, adjustment is highly political and sensitive to the state of political balance and the state of the overall budget balance. In contrast, a benefit based system redistributes through the design of the benefit formula. Whatever indexing is chosen for the general system also applies to the redistributive component as well.

In other instances the more explicit character of redistribution in contribution-based systems helps the poor. For example, only when high and low earners have similar length of working lives and retired lives does the redistribution incorporated in the benefit formula of benefit-based systems translate directly into actual redistribution. However, groups with higher annual income tend to have larger life expectancy (which may be somewhat offset by a tendency to work longer if the benefit design is less than actuarial). Similarly, if a benefit formula averages past earnings so that those earnings closer to retirement are assigned higher weights than a present value calculation would do, benefits become regressive, since high earners are likely to have a steeper earnings path. In principle, these factors can be offset by suitable design of the benefit formula of the benefit-based system, but this does not assure that it will be offset. In contribution-based systems these factors are eliminated by design, so regressive redistribution is less of a problem.

Consideration of life expectancy raises the issue that individuals at the same earnings levels may have different life expectancies. If they also have the same (ideal) working life then those with longer life expectancy are poorer on the basis of their annual consumption over their life, although they may enjoy living longer. A difficult question arises about whether those with higher life expectancy merit transfers. The conventional benefit based system answers implicitly in the affirmative, because benefits do not depend of

⁵¹Redistribution could have been done by (breakeven) transfers at the time of contributions to funds, as was analyzed by Boskin, Kotlikoff, and Shoven, (1988) op. cit.

individual life expectancy. A contribution based system may attempt to replicate this result, but the requirement of explicit identification of financing sources raises the political obstacles.

Now consider benefit seeking by special groups. In many countries, income redistributions have been done by having different benefit-based systems for different groups. In some countries, uniform benefit-based systems have been successful to block such moves. A contribution based system is presumably better at blocking such moves since the required transfers must be explicit. A privatized contribution-based system has a tendency to be even better to resist them, as both providers and trustees in representation of workers facilitate representation of the losers. As one example, the incentives on fund managers to vie for the risk-return frontier generates a built-in pressure group in favor of international portfolio diversification, even though this may leave some local groups worse off. The benefit for pensioners should be specially valuable in small countries where the local government's finances are risky.

Technical Efficiency

Many social security systems are set up with benefit formulas that are highly inefficient. This is particularly true of formulas that multiply a number of years times an average wage based on a short averaging period. Such a poorly designed formula is not a necessary part of a benefit based system, but it is very common. Some of the frequency with which it occurs may be attributed to the role of the formula in redistribution.

A major cost of privatized choice of provider - on either an individual or group basis - is that administrative charges are likely to be considerably higher than without such reliance on the private market. Above we have documented the magnitude of these costs and suggested alternative approaches that would hold these costs down.

However, one should also consider that the new institutions required by privatization of provision and selection of provider may have positive externalities. This seems to have been the case with the development of the capital market in Chile. In addition, up to now the Chilean government has left little freedom of design of new products to the agreement of private trustees and private providers, so the scope of the gains from diversity is unknown.

5.4.B. Response to surprises

A contribution based system is easy to place on automatic pilot, and thus insulate from major political revision. While variations in long-term real interest rates might make changes in the contribution rate appropriate, this is not needed for survival and is probably an easy matter of political adjustment. In contrast, the usual structure of a benefit based system is to have separate rules determining benefits and taxes and so periodic adjustment in one or the other is necessary to respond to surprises. The lack of automatic adjustment keeps the political process repeatedly involved in legislated changes. While these changes might be good and might be bad, historically, there is a high frequency of unsustainable changes⁵².

Thus one might consider how to put a benefit based system on automatic pilot. This can be done in a manner parallel to the mandatory savings system: Legislate a tax rate and legislate an adjustment to the benefit formula that keeps benefits in line with available income, which might include interest on a fund as well as tax revenue. In the absence of any experience with such a system, it is difficult to speculate on how well such a system can insulate retirement income from short run political forces.

From the perspective of the degree to which pension provision should vary with the state of the government budget, it seems likely that little response is the ideal answer. That is, the fact that some pensions are flowing through the government does not make this source of income a better bearer of risks associated with budget problems. Arguably pension income should adjust to government needs by less than other income, which would vary through tax changes. Similarly, a period of accumulation of funds for retirement within a nationalized system is no more of a reason to increase government expenditure than is private accumulation. Insulation of government expenditures from the state of the social security budget is also more easily done with a contribution based system than with a benefit based system. Restating, if the fiscal balance suffers a negative shock, pensions are shielded to a greater degree in the contribution based system. If the pension system suffers a shock, the budget is better protected.

Another aspect of the political process is the existence of private companies handling funds and providing annuities, who have an economic interest in preserving their business and commercial image. In a sense, private interest groups provide a complementary channel of expression to the private interest of workers. In relatively open political settings like the Chilean one, the possibility of total capture of regulators by AFP interests is slight, because individual politicians have a substantial electoral incentive to undo such collusion. The equilibrium that results from this competition between electoral and economic interests is

⁵²Decisions about funding that are made without affecting sustainability are decisions about intertemporal income redistribution. A decision to redistribute to early generations, and so have less capital in the future, is not necessarily a bad decision. In contrast, decisions that generate unsustainable systems with repeated fiscal crises are presumably poor decisions.

not unlike that observed in other regulated multiprovider industries, such as banking. However, if the political and economic processes are in fact one, because the same persons control both⁵³, then this political implication of privatization will not yield a significant improvement.

5.4.C. Insurance Aspects

It is interesting to compare the benefit and contribution based approaches on insurance dimensions. Both systems put some of the risks of fund accumulation on beneficiaries⁵⁴. The exact pattern of risk bearing is probably different, but it would require explicit formulation and modelling to compare the differences. In general terms, a contribution based system shifts risk from beneficiaries towards investors in the capital market, both domestic and foreign, while a benefit-based system shifts risk between different generations of workers.

Another difference between the two approaches comes with risk sharing at different dates at which information about life expectancy becomes available. That is, an individual would like to transfer resources from the contingency that he reaches retirement age with low expected need for expenditures, to the contingency where he has high expected need for expenditures. The easy case to consider is that of death before reaching retirement age (and assuming separate insurance of survivors). With no risk sharing, the estate goes to the worker's heirs. With risk sharing, there is no such bequest, and this money helps increase benefits for the case in which the worker survives into retirement.

In addition, a contribution based system with one-shot purchase of annuities at retirement does not provide insurance against the arrival of information before retirement age that affects the terms on which an annuity is available. Thus the combination of an annuities market that distinguishes among individuals on the basis of life expectancy and one shot purchase tends to defeat insurance as perceived at an earlier age. An ex-ante optimal system probably involves some move away from accurately priced annuities towards uniformly priced annuities (in parallel with a similar result in the presence of moral hazard)⁵⁵.

⁵³This seems to have been the case of the Philippines under Marcos. See R. Tiglao (1990) op.cit. pp. 48-49.

⁵⁴It is common to suggest that workers do not bear such risks in defined benefit private pension systems. This is only correct if neither wages nor benefit formulas nor firm viability are affected by rates of return. All of these seem problematic.

⁵⁵The optimal move is limited because the absence of correctly priced annuities tends to defeat rational choice between annuities and estates. We are not aware of any explicit modelling of optimal social design of such insurance. For an analysis of market equilibrium with repeated opportunities to buy annuities and information arrival over time, see A. Brugiavini, "Uncertainty Resolution and the Timing of Annuity Purchases", *Journal of Public Economics* 50 (January 1993), 31-62.

Conventional benefit-based systems provide this insurance by paying benefits that are independent of life expectancy, so they may produce too much averaging. Contribution-based systems can only give this insurance by arranging for partial purchases of deferred annuities at different ages, such as 50, 55, 60 and 65, but this leads to difficult issues of marketing costs and solvency regulation.

We have identified a number of different issues in choosing a basis for social security. The balance of these costs and benefits should be different for different countries, as it seems to depend of the institutional ability to design and operate regulations to limit inefficiency and fraud by private providers and trustees, as compared to the institutional ability to limit abuse and inefficiency when management is in charge of the political process. An important specific requirement of systems with private provision seems to be to allow private sector firms and banks to issue CPI-indexed securities.

However, this comparison may be misleading if a third option is not considered. This is for countries without a system to continue relying on family and tribal insurance, avoiding mandatory earnings-related pensions altogether. This option is compatible with substantial income redistribution towards the old channeled through other institutions, such as government taxes and transfers. Of course, this option replaces the cost of abuse and inefficiency by private providers or the political process, for the risk of abuse within the family and does not take advantage of specialization. The fact that until recently Australia, New Zealand and South Korea have chosen this option suggests it should not be discarded off hand.

Chile has given us a fascinating example to examine. It is interesting to study and important to consider imitating.

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TABLE 1: THE ASSISTANCE PENSION IN CHILE

Year	Number of pensions paid (monthly average)	New pensions issued (N° per year)	Amount (share of aver. reported salary after contr. ^a)	Cost (millins of US\$)
1987	318,715	19,039	16,4%	76.1
1988	290,966	33,391	10.2%	80.6
1989	292,321	40,198	7.7%	81.6
1990	293,199	50,321	10.5%	96.0

SOURCE: Estadísticas Seguridad Social 1990 pages 39, 62 and 63; Average Reported Salary after contributions from Superintendencia de AFP, Boletín Estadístico various Numbers.

- a The average reported salary after contributions is for those that contributed to the earnings-related pension system AFP in November of each year. For 1990, it was estimated on the basis of the methodology used by the Superintendency of AFP for September 1990, plus the wage index variation until November 90. For the previous years, a preliminary average reported salary was obtained by dividing the flow of contributions to AFPs for November by the total number of contributors. Then this figure was adjusted so that the November 89 number would equal the number produced by the SAFP methodology minus the change in the wage index. Finally, the series was put on an after-contribution basis by subtracting the 10% contribution rate of the AFP system. Those with salaries at the average level reported here do not pay personal income taxes.

TABLE 2: PROJECTED FISCAL COST OF THE MINIMUM PENSION
(millions of dollars per year)^a

Men	Women	Total	% of GDP ^b
Real rate of return of pension funds is 3.5%			
39.2	103.7	142.9	0.45%
Real rate of return of pension funds is 5.0%			
4.9	33.8	38.8	0.12%

SOURCE: Gert Wagner, "La seguridad social y el programa de pensión mínima garantizada", *Estudios de Economía*, Vol. 18 (June 1991), Table 25, demographic alternative EEF, which considers the fall in fertility and increase in life expectancy.

- ^a The exchange rate was 221. Unidades de Fomento per US dollar, for December 1991.
^b GDP for 1991 was US\$ 32 billion.

TABLE 3: CONTRIBUTORS AND PENSION IN THE NEW SYSTEM

	1987	1988	1989	1990
N° of contributors ^a	1,675,615	1,772,371	1,97,629	1,961,547
N° of old age, invalidity and survivorship pensions ^b	45,915	56,366	69,435	87,061
N° of early pensions	0	772	2,824	5,790
Administrative personnel ^c	5,864	6,552	6,921	8,005

SOURCE: Habitat, "Habitat (1991) Diez años de Historia del Sistema de AFP, 1981-1991" Pages 39, 175 and 333.

^a The number of contributors is the number for just the month of November. The number that contributes at least once per year is much larger.

^b The number of pensions are those paid in December of each year.

^c Personnel also corresponds to December.

TABLE 4: CONTRIBUTORS AND PENSION IN THE OLD SYSTEM
(only civilians are reported)

	1987	1988	1989	1990
N° of contributors	441,728	421,012	390,061	367,833
N° of pensions	914,587	899,152	892,289	888,432
Administrative personnel	4,804	4,536	3,678	not.av.
Av. taxable income old s. /Av. tax income new s. ^a	71.0%	62.1%	58.7%	54.7%

SOURCE: Estadísticas Seguridad Social 1990 pages 15, 39-46. The number of pensions is the Total minus Military, Police and Assistance pensions; and Ministry of Labor, Evolución de la seguridad social chilena en el período gubernativo 1973-1989 page 41.

^a The average taxable income in the new system is estimated as indicated in the section on the minimum pension.

TABLE 5: USES OF FUNDS IN CHILEAN SSIs IN 1947-52
(% of total expenditure)

SSIs:	Seguro obrero (blue-collar)	EMPART (white-collar)	Railroad workers	Bank employees
Pensions	8.3	18.2	29.8	29.9
Health services	75.9	3.1	7.5	8.4
Family allowances ^a	0	67.2	32.4	52.2
Other subsidies	0	3.8	0	0.7
Administrative costs	15.8	7.6	45.5	10.1

SOURCE: Gert Wagner, "Antiguo sistema 1925-1980", Estudio de la Reforma Previsional, vol. 2 (Santiago: Instituto de Economía, U. Católica, 1983), pp. 22-23.

^a The level of family allowances in EMPART was so large that it increased the income of covered employees by 21% on average (Ricardo Ffrench-Davis, "Políticas Económicas en Chile 1952-1970", CIEPLAN (Santiago: Ediciones Nueva Universidad, U. Católica, 1973), p. 191.)

TABLE 6: FISCAL EFFORT IN CHILE BEFORE THE REFORM
(% of GDP, general government)

	1977	1978	1979	1980
Tax revenue	26.6	25.5	25.7	26.3
Other revenue	12.1	7.7	6.8	6.6
Net income from capital	-0.5	-0.8	0.7	-0.3
Public consumption	15.9	14.7	12.1	11.9
Transfers to social security	7.0	6.9	7.0	7.1
Other transfers and other	8.4	3.6	4.4	4.7
Interest on the public debt	1.7	1.6	1.2	0.8
Public investment	4.2	3.5	3.2	2.6
Fiscal balance	0.9	2.2	5.2	5.5
GDP growth rate	9.9	8.2	8.3	7.8

SOURCE: Larraín, Felipe, "Public Sector Behavior in a Highly Indebted Country: The Contrasting Chilean Experience", in Felipe Larraín and Marcelo Selowsky, eds. The Public Sector and the Latin American Crisis (San Francisco: ICS Press, 1991), pages 97-98.

TABLE 7: FISCAL IMPACT OF THE TRANSITION AND PROJECTIONS
(millions of Chilean \$ of May 1988; %)

Year	Fiscal Impact			% of Actual FDG growth)	% of Potential GDP (Contant 4%
	Old system	R. bonds	Total		
1981	52,345	237	52,582	1.48	1.48
1982	124,162	3,345	127,507	4.19	3.46
1983	138.513	6.512	145.025	4.80	3.78
1984	146.520	7.903	154.423	4.80	3.88
1985	140.459	9.887	150.346	4.57	3.63
1986	150.809	14.106	164.915	4.74	3.83
1987	160.064	17.896	177.960	4.84	3.97
1988	163.392	19.436	182.828	4.73	3.92
Projections:					
1990	169.253	25.750	195.003	not av.	3.87
1995	182.509	47.286	229.795	-	3.75
2000	175.158	63.841	238.999	-	3.20
2005	145.235	78.191	223.426	-	2.46
2010	108.633	73.461	182.094	-	1.65
2015	85.054	42.920	127.974	-	0.95

SOURCE: Ortúzar, Pablo, "El déficit previsional: recuento y proyecciones", in S. Baeza and R. Manubens, eds. Sistema Privado de Pensiones en Chile (Santiago: Centro de Estudios Públicos, 1988), pages 111 and 124.

^a We calculated the last column was calculated for a constant GDP growth rate of 4% with 1981 as base year. The prediction of a rapid reduction of the transition deficit by 2015 is currently under review because recognition bonds may cost more than projected here (M. Marcel and A. Arenas, "Reformas a la Seguridad Social en Chile", Washington, D.C.: Interamerican Development Bank, Serie Monografías 5 (1991), p. 39.

The projection in the last column can be checked with the numbers published by Marcel and Arenas (1992), p. 36, who find that the transition deficit was 3.5% of actual GDP in 1989. This is lower than our projection because we do not consider the positive effects of recovery on contributions to the Old System. The conclusion is that the transition deficit can be expected to stay below 4% of GDP for the first 15 years in a stable scenario, to fall subsequently. Not all of this is an addition to national saving, because the initial impact on private saving was negative, as discussed below.

TABLE 8: PRIMARY FISCAL BALANCE EXCLUDING ALL PENSIONS

Year	% of GDP	Year	% of GDP
1980	10.01	1986	8.25
1981	9.65	1987	10.01
1982	6.29	1988	12.45
1983	5.36	1989	11.39
1984	6.72	1990	10.18
1985	7.70	1991	9.58

SOURCE: Budget data for the general government published by P. Arrau ("El Nuevo Regimen Previsional Chileno", Regimenes Pensionales (Bogotá, Colombia: Friedrich Ebert Foundation, 1992), Table 7, p. 56. It excludes the quasi-fiscal deficit of the Central Bank. All pension-related flows are excluded, including the Defense and Police SSIs, Assistance and Minimum pensions.

TABLE 9: TOTAL AFP INDUSTRY COSTS OVER TIME
(billions of Ch.\$ of 1990, millions of persons, thousand Ch\$/person)

Year	1982	1983	1984	1986	1988	1990	1991
DI and SI costs	n.a.	n.a.	n.a.	n.a.	32.80	30.14	24.23
Administ. cost.	17.18	16.88	18.66	18.79	23.88	30.55	33.51
Marketing cost	8.55	5.46	5.45	5.00	7.30	9.37	11.58
Profit after tax	-4.89	-0.46	0.58	4.91	6.07	15.45	17.31
Contributors in							
Dec. for Nov.	0.91	1.05	1.14	1.49	1.77	1.96	2.49
Affiliates (Dec.)	1.44	1.62	1.93	2.59	3.18	3.74	4.11
Adm. cost/cont.	18.9	16.1	16.4	12.6	13.5	15.6	13.5
Ad. + mktg/cont.	28.3	21.3	21.1	16.0	17.6	20.4	18.1
DI&SI cost/cont.	n.a.	n.a.	n.a.	n.a.	18.5	15.4	9.7
Profit/contrib.	-5.4	-0.4	0.5	3.3	3.4	7.9	6.9

SOURCE: Up to 1989, Habitat (1991) pages 284-285. For 1990, Superintendencia de AFP: Estados Financieros Anuales de las AFP 1989 and 1990. For 1991, Superintendencia de AFP: FECU: Income and Loss Statements of AFP for 1991.

TABLE 10: CROSS SECTION OF COSTS, SCALE AND COMMISSIONS FOR 1991
(millions in Dec. 1991, Chilean \$ of Dec. 1991 per contr., % Ch. \$ of Dec. 91, Ch. \$ per month in Dec. 91)

AFP	Scale (millions)		Costs per contr.		Sales- people	Average Other workers	Comissions		flat
	Affil.	Contrib.	Adm. ^a	Sales			taxab.	% wage of wage contr.	
Prov.	1.198	0.782	11.41	4.07	786	1863	88.7	2.50	230
S. Ma.	0.862	0.481	14.77	5.20	772	1406	91.9	2.95	100
Hab.	0.712	0.443	15.44	4.13	420	1256	111.5	2.95	0
Unio	0.336	0.181	25.40	7.43	399	919	101.6	3.70	290
Sum	0.329	0.206	18.49	4.90	267	780	125.9	2.97	230
Inv	0.141	0.065	24.55	6.46	232	479	84.6	3.74	497
Con	0.140	0.063	16.38	5.46	290	440	59.8	3.48	230
Pla	0.100	0.046	17.04	10.00	276	396	85.6	3.70	280
Cup	0.098	0.080	17.76	14.60	265	445	235.6	2.99	0
E.Lib.	0.083	0.052	23.81	8.50	155	328	110.5	3.40	178
Mag.	0.065	0.046	24.24	7.11	114	318	87.0	3.40	220
Prot.	0.038	0.033	30.06	18.73	122	285	203.9	3.27	0
Fut	0.007	0.007	38.86	11.0	36	74	226.0	3.24	0 ^b

SOURCE: FECUS and Boletín Superintendencia AFP.

^a Note that administrative costs do not include sales costs or profits.

^b Future is the only AFP that charges an entry commission, of 1% of the outstanding balance in the individual account.

TABLE 11: AFFILIATES AND MINIMUM CAPITAL

N° of Affiliates	Minimum Capital (approx. US\$)
> 5,000	120,000
5,000 - 7,499	240,000
7,500 - 9,999	360,000
+ 10,000	480,000

SOURCE: Superintendencia de AFP: Decreto Legislativo N° 3.500 Article 24.

TABLE 12: NUMBERS OF BROKERS

Year	1987	1988	1989	1990
N° of brokers (at Dec. each year)				
- individuals	1566	1749	1923	2066
- societies	216	246	276	300
Gross inflow of new brokers to the registry				
- individuals	181	332	263	211
- societies	18	43	35	29
Gross outflow of brokers from the registry				
- individuals	101	149	89	72
- societies	4	13	5	5

SOURCE: Frugone, J.P. (1992), "Análisis del Mercado de Rentas Vitalicias Previsionales", Thesis N° 106 (Santiago, Instituto de Economía, U. Católica, 1992). Tables 13, 14 and 15 in pages 28, 30 and 31.

TABLE 13: EXPOSURE OF CHILEAN PENSION PORTFOLIOS TO INFLATION SURPRISES
(Share of portfolio in designated instrument class, June 1992)

Total portfolio	100.00%
Minus indexed bonds:	
Government bonds:	37.16%
Long term bonds issued by banks:	14.43%
Long term bonds issued by firms:	10.04%
Net exposure	38.37%
Minus equity:	
Equity in firms	27.62%
Other equity	0.40%
Remaining exposure	10.35%
Minus CPI-indexed bank CDs	Not available
Final exposure	Not available, but probably less than 3%

SOURCE: Author's calculation from Superintendencia de AFP: Boletín Estadístico 111, June 1992, page 163.

TABLE 14: REAL RATES OF RETURN ON FIXED ANNUITIES AND FIXED INCOME BONDS

Month	Annuities (A)	ESTX20 (B) ^a	Bonds ESTU12 ^b	Spread B-A
1987:9	3.54	6.30	6.06	2.76
1987:12	4.01	5.97	5.50	1.96
1988:3	4.37	5.40	5.34	1.03
1988:6	4.14	5.75	5.58	1.61
1988:9	4.26	6.19	56.03	1.93
1988:12	3.76	6.61	6.37	2.85
1989:3	3.77	6.69	6.55	2.92
1989:6	3.48	7.16	7.07	3.48
1989:12	4.87	8.07	7.96	4.28
1990:3	5.27	8.83	9.20	3.56
1990:6	5.81	8.60	8.67	2.79
1990:9	5.67	7.07	7.63	1.40
1990:12	5.27	6.64	6.76	1.37
1991:3	5.05	6.35	5.93	1.30
1991:6	5.01	6.45	6.57	1.44
1991:9	5.09	5.89	5.97	0.80
1991:12	4.72	5.79	5.85	1.07

SOURCE: Carlos A. Díaz and Salvador Valdés-Prieto, "La tasa de interés del retiro programado: crítica y propuesta", Working Paper N° 149 (Santiago: Instituto de Economía, U. Católica, 1992).

^a The bond ESTX20 is issued by the state-owned commercial bank, pays over 20 years equal amounts indexed to the CPI.

^b ESTU12 is issued by the same bank but pays over 12 years. Both are backed by the bank's guarantee and by a portfolio of mortgages loans. These are prices in the primary market.

TABLE 15: COMMISSIONS TO ANNUITY BROKERS IN CHILE
(billion pesos of December of each year)

Year 1987	1988	1989	1990	1991	
Premium income					
- age and early pensions	8.3	14.0	27.1	62.8	133.4
- invalidity	-	2.6	10.7	14.8	6.8
- survivorship	-	1.4	5.0	13.7	10.5
Total	8.3	18.1	42.7	91.3	150.6
Commissions to intermediaries					
Total	0.21	0.42	0.67	2.67	5.12
Commissions/premiums	2.47%	2.32%	1.56%	2.93%	3.40%

SOURCE: Superintendencia de Valores y Seguros, Anuario de Seguros 1991, pp. 88-90.

TABLE 16: ACTUAL RETURNS OBTAINED BY THE AVERAGE PENSION FUND
(weighted average annual % in real terms, UF variation)

Year	Return	Year	Return	Year	Return
1981	12.9 ^a	1985	13.4	1989	6.9
1982	28.5	1986	12.3	1990	15.6
1983	21.2	1987	5.4	1991	29.7
1984	3.6	1988	6.5	1992	5.2

SOURCE: Boletín Superintendencia AFP.

^a July to December 1981. AFPs started operations in May 1, 1981.

TABLE 17: SHARE OF PENSION FUND HOLDINGS IN THE STOCK OF FINANCIAL ASSETS
(participation in pension fund portfolio in parenthesis)

	1982	1984	1988	1990 (September)	1992 ^a (June)
Treasury bonds and central bank bonds	22.5 (26.0)	28.7 (42.2)	32.2 (35.4)	39.0 (44.1)	37.8 (37.2)
Bank deposits and bonds	4.5 (26.6)	6.0 (12.9)	23.7 (29.5)	19.9 (17.4)	18.2 (11.8)
Mortgage bonds guaranteed by banks	24.9 (46.8)	44.0 (43.1)	53.0 (20.6)	56.1 (16.1)	59.6 (12.9)
Corporate bonds	1.3 (0.6)	10.2 (1.8)	48.1 (6.4)	55.6 (11.1)	61.1 (10.0)
Corporate equity	0 (0)	0 (0)	8.4 (8.1)	8.6 (11.3)	9.6 (27.6)
Value of pension funds (%of GDP)	3.6	8.6	16.5	26.5	35.44

SOURCE: Up to 1990, Habitat (1991), p. 82 and 86.

^a The column for June 1992 was estimated by the authors from the Boletín Mensual (Banco Central de Chile) and the Boletín Estadístico (Superintendencia de AFP).