



# **Integrated Disability and Retirement Systems in Chile<sup>1</sup>**

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# Executive Summary

People are living longer and healthier lives, yet disability benefits are the fastest growing portion of social security expenditures in the United States and many other countries. What can be done to restrain the rising cost of disability? Chile may have found a partial answer.

Chile once had a pay-as-you-go (PAYGO) public pension system similar to Social Security in the United States. In PAYGO systems, the taxes of today's workers fund the benefits of today's retirees. Chile was experiencing problems that are unavoidable in PAYGO systems, including the United States today: Due to decreasing birth rates and increasing longevity, the number of workers supporting each retiree was falling, so the government could not finance all the promised benefits without ever-higher taxes.

**Chile's System of Private Insurance and Private Accounts.** Twenty-five years ago, Chile replaced its traditional old age security system with one in which workers contribute to accounts they individually own. The money is invested by a pension fund chosen by each worker from among a number of competing, privately-owned firms. Thus the retirement benefits of workers are largely prefunded by their own savings, rather than passing the burden on to others. Many countries have followed Chile's lead and adopted retirement systems that include prefunded accounts.

At the same time, Chile reformed its disability insurance system. The new disability system is less well-known than its pension scheme, but it is equally innovative. First, like the old age system, it is prefunded, so each generation covers its own disability costs. Second, private pension funds and insurance companies participate in the process of assessing workers' disabilities, and financially benefit from controlling costs. Disability rates and costs in the new system are lower than in the old system and lower than in most other countries.

**Features of the Chilean System.** Specifically, disabled workers who qualify are guaranteed a defined benefit for the balance of their lives: 70 percent of their average wage (if totally disabled) and 50 percent (if partially disabled). The benefit is funded in two ways. First, the money in the worker's retirement account is available in case of a disability. Second, if the amount in the account is insufficient to pay for a lifetime annuity at the specified level, the balance is funded by a group disability insurance policy purchased by each pension fund and paid for by its affiliated workers. Survivors' benefits for the spouse and minor children of a deceased worker are covered by the same group disability and survivors (D&S) insurance contract. Thus, at the point when a worker has been certified as permanently disabled, his entire lifetime defined benefit has been funded by a combination of his own retirement account and a top-up from the D&S insurance. This means that costs are not passed on to future generations. (If the 70 percent or 50 percent wage replacement rate for a disabled worker is less than the minimum pension guaranteed by the government, the worker's benefit is augmented by the public treasury.)

**Modeling the Chilean System.** A model was developed to compare the disability insurance fee in Chile with the annual costs of covering disability benefits in a PAYGO system, assuming the same incidence of disability and levels of benefits. The model predicts that annual costs will be higher in Chile for the first 14 years of the new system, compared to a PAYGO system, because individual accounts are small and the insurance fees have to finance reserves for a lifetime of annuity payouts. But over time the insurance fee is expected to fall dramatically, as an increasing percentage of disability costs are funded by workers' accounts. In the long run, fees in a Chilean-type system are predicted to be much less than annual costs in a PAYGO system. The model also showed that fees in a Chilean system would be very sen-

sitive to the interest rate, rising as the rate of return on investments falls, but less sensitive to population aging than a PAYGO system.

Indeed, actual combined fees for disability and survivors insurance in Chile fell until 1998 as accounts built up, then rose slightly due to falling interest rates. As of 2005 the combined insurance fee was less than 1 percent of wages, much less than the tax that would be required to finance annual payouts to the disabled and survivors in a PAYGO system. Annual fees are lower in Chile because disability benefits are financed partly by money in the workers' retirement accounts and partly by investment earnings on the annuity purchased by the worker, reducing the cost of the insurance top-up.

**Controlling Costs.** Total disability expenditures are also controlled through the participation of pension fund managers in determining disability criteria and administering disability benefits. Unlike government bureaucrats, they have a financial interest in limiting the number of beneficiaries. Independent medical boards determine the degree of a worker's disability based on medical criteria, but a nonvoting representative of the pension funds is usually present and may ask questions. Pension funds are allowed to appeal disability determinations, in contrast to traditional public systems in which the worker is often the only party who may appeal. Pension funds help set the medical criteria for full versus partial disability and keep the contribution records that determine whether or not a worker is eligible for the insurance top-up. This system has reduced age-specific disability rates and therefore total disability costs.

**International Comparisons.** Although many other factors are undoubtedly involved, the incidence and costs of disability are much lower in Chile than in countries with traditional PAYGO systems:

- In 1999, for example, among middle-aged (45-to-54) insured workers, 2.9 per 1,000 were newly classified as disabled in Chile, less than half the rate in the United States (7.8 per 1,000) and less than one-third the rate in European (OECD) countries (8.6 per 1,000).
- The D&S fee in Chile is only 1 percent of wages, of which about two-thirds is for disability and one-third is for survivors.
- In other Latin American countries that have adopted the Chilean model — such as Argentina and Colombia — D&S fees are 0.9 percent to 1.7 percent of wages.
- By contrast, PAYGO disability benefits in the United States are 1.8 percent of wages (and cover the disabled only until normal retirement age).
- They are over 3 percent of wages in most other OECD countries and up to 10 percent in some European countries.

**Retaining Work Incentives.** Having a disability does not mean a worker is unable to work; rather, it is a medically-determined physical or mental impairment that can reduce a worker's earning capacity. In most countries workers are not allowed to work while they receive disability benefits. Very few beneficiaries return to work and relinquish their benefits. In Chile, workers who are granted permanent disability status are allowed to continue working while retaining their annuity. In this way, the Chilean disability system encourages work, benefiting the individual, the system and the economy.

**Opportunities for Reform.** Countries around the world are faced with rising costs of social security programs. In many countries, such as the United States, disability expenditures have been rising even faster than old age expenditures. The experience of Chile suggests that these costs can be contained in the long run by prefunding and by private participation in the assessment procedure. Publicly managed PAYGO systems might consider adopting processes that mimic these characteristics.

## Introduction

Twenty-five years ago, Chile replaced its traditional social security system with one in which workers make mandatory contributions to accounts they individually own. Each worker contributes 10 percent of wages to his or her personal retirement account, plus another 2.4 percent to cover administrative expenses, and survivors' and disability insurance. The money is invested by a pension fund, called an AFP (for Administradoras de Fondos de Pensiones), chosen by workers from among a number of competing, privately-owned firms. Thus the retirement benefits of workers are prefunded by their own savings. [See the side bar "Personal Retirement Accounts in Chile."]

The disability insurance system in Chile is much less well-known than its pioneering pension system, but it is equally innovative. It differs from traditional public disability insurance in two important ways: 1) it is largely prefunded; and 2) the disability assessment procedure includes participation by private pension funds and insurance companies, which have a direct pecuniary interest in controlling costs. This paper describes how Chile handles disability insurance, and draws lessons from that experience for other countries, including the United States.

The United States and many other countries have traditional pay-as-you-go (PAYGO) defined-benefit public pension systems. In PAYGO systems, today's workers pay Social Security taxes to fund benefits for today's beneficiaries. Due to falling birth rates and increasing longevity, the number of workers supporting each retiree is falling. Thus, public retirement systems that transfer income from today's workers to today's retirees will require ever-higher taxes on current workers to pay benefits. To avoid the problems inherent in PAYGO systems, many countries have followed Chile's lead and adopted retirement systems that include prefunded accounts. The United States has also considered such a system.

Disability and survivors' benefits constitute the fastest growing portion of social security expenditures in the United States and many other countries.<sup>2</sup> It is particularly difficult to incorporate these programs into a system with personal retirement accounts. Workers who contribute steadily to a funded account may be able to fund ample retirement benefits. But those who become disabled when young have small individual account balances that could only replace a small percentage of their wages. Moreover, if the personal account is topped-up to provide a more generous defined disability benefit, workers may be encouraged to apply for disability rather than old age (retirement) benefits, thereby increasing system costs. Chile's experience shows how a personal retirement account system can handle problems associated with disability insurance.

*"Workers in Chile can withdraw funds from their individually-owned retirement accounts if they become disabled."*

## Personal Retirement Accounts in Chile

In the early 1980s, Chile replaced its traditional social security system with a prefunded system in which workers make mandatory contributions to accounts they individually own. Each worker covered by the system must contribute 10 percent of wages to his or her personal retirement account, plus another 2.4 percent to cover administrative expenses and survivors and disability insurance.

The money is invested by a pension fund, called an AFP (for *Administradoras de Fondos de Pensiones*), chosen by workers from among a number of competing, privately-owned firms. AFPs must invest according to strict guidelines. Over the past 25 years account investments have earned an average annual 10 percent rate of return, after adjusting for inflation. (The rate of return is expected to fall in the long run.)

Payouts are also tightly circumscribed: When they retire, workers can choose between annuities and programmed withdrawals. For annuities, workers turn their accounts over to an insurance company and receive a guaranteed income for life, indexed for inflation, but forgo the right to leave a bequest to heirs. About two-thirds of retired workers annuitize. For programmed withdrawals, the account is left with a pension fund administrator and retirees annually withdraw an amount determined by a preset formula. Retirees who choose programmed withdrawals can bequeath any funds remaining in their account at their death to their heirs, but they run the risk of exhausting their accounts before they die. Regardless of the option chosen, the government makes a minimum pension guarantee (MPG) to all workers who have contributed for 20 years. The MPG is about 25 percent of the average wage, rising to 27 percent at age 70 and 29 percent at 75.

Chile's pension system also provides insurance for widows financed by their husbands rather than by the public treasury. Married men who annuitize must buy joint annuities, which provide the surviving widow at least 60 percent of the husband's annuity (if there are surviving dependent children, the annuity provides 50 percent to the widow plus 15 percent to each child). The formula for programmed withdrawals also includes these provisions for widows and survivors.

Also, workers have a choice of the age at which they begin to withdraw their money from the system. The normal retirement age is 65 for men, 60 for women. After this age, workers may begin withdrawing funds regardless of the amount accumulated. But workers are permitted to take early retirement and make early withdrawals at any age once they have accumulated an account balance large enough to finance a pension that is 150 percent of the MPG and 70 percent of their own average wage. For these workers, further contributions are voluntary rather than mandatory.

It is important to note that "early retirement from the system" does not mean "retirement from the labor force." It simply means workers start withdrawing from, and may stop contributing to, their retirement accounts. In fact, the elimination of the required contribution may have a positive impact on the labor supply of older workers. Preliminary evidence indicates that the labor force participation of older workers has been rising since the mid-1980s, very likely as a result of the pension reform.<sup>1</sup>

<sup>1</sup> See Alejandra Cox Edwards and Estelle James, "Pension Reform and Postponed Retirement: Evidence from Chile," Michigan Retirement Research Center, Working Paper 2005-098.

## Basic Structure of Disability Insurance in Chile

Chile has successfully integrated disability insurance into its retirement system. It is prefunded and it provides financial incentives (and opportunities) for private firms to control costs. If a worker becomes disabled before retiring, he receives a defined benefit. Part of this benefit is covered by his or her own retirement account. The remainder is covered by an insurance policy purchased by each pension fund (AFP), which provides the top-up needed for disability and survivors (D&S) benefits. This is accomplished through the private insurance market, with government providing detailed regulations and back-up guarantees.

**Financing Disability Insurance Benefits.** A worker who qualifies for disability insurance is guaranteed a defined benefit for the balance of his or her life. The amount of the benefit is based on the “reference wage” — the worker’s average, inflation-adjusted wage over the prior 10 years.<sup>3</sup> For each of these years, if a worker has not contributed to the system, a zero is averaged in, lowering his reference wage and benefit. The ceiling for contributory wages also creates a ceiling on the reference wage. An insured worker is guaranteed to receive 70 percent of his average wage (if totally disabled) and 50 percent (if partially disabled), up to the maximum guaranteed benefit.

*“Insured disabled workers are guaranteed 70 percent of their average pay.”*

During an initial three-year period, a disabled worker receives a temporary defined benefit directly from his pension provider (the AFP). If a worker is certified as permanently disabled after the three-year provisional period, he has a choice of a lifetime annuity or a gradual withdrawal of money from his account.<sup>4</sup> The programmed withdrawal does not provide longevity insurance but does give the worker the right to bequeath any money left in the account if he should die.

If the worker doesn’t have enough money in his account to purchase a pension that covers the defined benefit, the AFP is responsible for “topping up” the account to the required level. To cover the cost of this top-up and the three-year provisional benefit, each AFP is required to purchase a term group insurance policy.<sup>5</sup> Survivors’ benefits are covered in the same way, by the same insurance policy.

The group disability insurance policy is funded by the general administrative charge each worker pays the AFP. Each AFP sets its own fees and, apart from a small flat component, charges all its affiliated workers the same percentage of their wages — regardless of age, gender, occupation or size of the account. AFP fees currently average about 2.4 percent of a worker’s wages. This includes the combined cost of the group disability and survivors’ insurance, which is about 1 percentage point of wages (of which the disability portion is two-thirds), and general administrative charges, which account for the other 1.4 percent.<sup>6</sup>

Thus the total future pension of the disabled individual is prefunded — partly out of his own retirement savings and partly by the group insurance policy purchased by the AFP and financed by the D&S insurance fee paid by workers.

**Determining the Degree of Disability.** A disabled worker receives a defined benefit based on his degree of disability, as defined by medical criteria.<sup>7</sup> In general:

- If the degree of disability exceeds 67 percent, the claimant is considered totally disabled, whether or not he has continued to work, and he is granted a defined benefit equal to 70 percent of his wage.
- If the disability is between 50 percent and 67 percent, he is partially disabled and entitled to a 50 percent defined benefit.
- If the disability is less than 50 percent, he is not considered disabled.

Of the claims approved in 2004, 25 percent were for partial disability, a proportion that has been increasing over time.<sup>8</sup>

**Eligibility for Disability Insurance.** While certification of a disability depends purely on medical grounds, eligibility for the insured defined benefit depends on recent work history. A worker qualifies for disability insurance benefits if he or she was working and contributing at the time of the claim, or meets certain other requirements.<sup>9</sup> In addition, the worker must not be receiving a retirement pension or be over the normal retirement age. Individuals who postpone pensioning past the normal retirement age, or who continue working while retired, are no longer covered by disability and survivors' insurance and do not have to pay the insurance fee. These eligibility conditions are less stringent than those of other countries.<sup>10</sup> Workers who are certified as permanently disabled but are not eligible for insurance can withdraw money from their accounts as a life annuity or programmed withdrawal but do not get the top-up that ensures the defined benefit.

**The Minimum Pension Guarantee.** Whether or not they are eligible for the private insurance, disabled workers may qualify for the publicly-funded minimum pension guarantee (MPG). This requires 10 years of contributions and sometimes even less, over their lifetimes.

Disabled pensioners with large account balances tend to annuitize in order to have protection against the risk of outliving their savings. Those with small accumulations tend to take programmed withdrawals and rely on the MPG to provide longevity insurance:<sup>11</sup>

- As of 2003, 60 percent of all disabled beneficiaries were taking programmed withdrawals — corresponding to the predominance of small retirement account balances among the disabled.

*“Workers qualify for disability based solely on medical criteria, but they qualify for disability insurance based on their recent work history.”*

- The average monthly programmed withdrawal was roughly half the average annuity benefit payment.
- In 2003, more than half of disabled programmed withdrawal pensioners were drawing down their accounts at the minimum level (equal to the MPG), and another quarter had exhausted their accounts and were relying on the MPG.

In fact, the majority of current MPG recipients are disabled and survivor beneficiaries. [See the sidebar “The Minimum Pension Guarantee and Disabled Workers.”]

## How Costs Are Controlled in the Assessment Procedure

In most public disability systems a public agency or body of medical experts must juggle sometimes-conflicting roles as advocate for taxpayers, protector of claimants and impartial judge and jury. Neither civil servants nor medical experts have direct financial incentives to limit successful claims. The high disability costs in many countries are partly due to public gatekeepers who are generous at the taxpayers’ expense, who accept bribes in return for applying lax standards, or who allow governments to use disability benefits as a substitute for unemployment insurance or early retirement.

Chile’s disability system, by contrast, attempts to balance public gatekeepers with countervailing incentives for private AFPs to contain costs. AFPs play a major role in the administration of disability benefits, including participating in claim assessments, appeals and determining disability criteria. For any given total fee the AFP charges, lower disability costs mean more profits for the AFP.<sup>12</sup>

The following outlines how the system is structured and the various ways AFPs participate.

**Assessing Disabilities.** Initial claims are evaluated by 21 Regional Medical Boards. Each Board has three doctors, employed by the public Superintendencia of AFPs (SAFP) but financed by the AFPs. Nonvoting medical observers from AFPs and insurance companies regularly attend Board meetings, make comments and keep track of their work. Claimants may also present their own medical tests and have their personal doctors take part in the discussions (but not the vote).

After an initial assessment, about 60 percent of all workers claiming disability are certified for provisional, or temporary, disability status by a Medical Board.<sup>13</sup> Three years later — or sooner if the individual reaches the normal retirement age — the worker is reassessed. Currently, 80 percent of the temporary disabled come up for a second assessment (most of the attrition

*“Uninsured disabled workers get the money in their accounts as well as a minimum, government-funded pension, providing they meet the eligibility conditions.”*



## The Minimum Pension Guarantee and Disabled Workers

Any worker who has been certified as disabled can make programmed withdrawals from his or her personal retirement account, but many of the workers ineligible for insurance benefits have small account balances and quickly exhaust their funds. The probability of being certified as disabled has risen in the past decade, with a disproportionate share of the growth occurring among workers who do not qualify for disability insurance coverage. However, eligibility requirements for the Minimum Pension Guarantee (MPG) are looser than for disability insurance; thus, many workers who don't qualify for disability insurance do qualify to receive MPG benefits.

Furthermore, it is easier for a worker to qualify for the MPG when disabled than at retirement. While a nondisabled worker must have 20 years of contributions to receive the MPG at retirement, a disabled worker qualifies if he: 1) contributed to the social security system for at least 10 years;<sup>1</sup> 2) contributed for at least two of the last five years; 3) contributed for 16 months if he joined the labor force within the last 2 years; or 4) was contributing at the date of disability if it was caused by an accident.<sup>2</sup> Since low-wage workers with 10 to 19 years of contributions can only qualify for the MPG if they are disabled, they have an incentive to seek disability certification.

Once they meet the eligibility criteria, several subgroups of disabled are likely to have personal accounts that fall below the MPG level: 1) workers who are granted disability status but are not eligible for insurance because they are not current contributors; 2) insured individuals who contributed for only a fraction of their working years; 3) insured individuals who choose programmed withdrawals and live longer than the out-dated mortality tables predict; 4) partially disabled workers who get only a 50 percent defined benefit; and 5) surviving widows of disabled workers.<sup>3</sup> Note that each of these categories is due to policy choices that reduce the cost of the private insurance but can increase the cost of the public contingent liability. The MPG serves as a safety valve for a cost-conscious private disability insurance system.

The MPG is indexed to inflation, not wages, but politicians have raised it by an average of about 2 percent a year above inflation to keep pace with wages. Increases in the MPG could eventually add substantially to the public cost of disability pensioners and their survivors, who may be young and live many years after retiring. As the MPG rises, allowable programmed withdrawals rise, the accounts are used up faster and the government must step in sooner. Based on these data, it seems likely that an increasing proportion of disabled pensioners will eventually receive the MPG. Private disability costs may remain constrained, but public spending will probably rise over time.

<sup>1</sup> Estelle James, Guillermo Martinez and Augusto Iglesias, "The Payout Stage in Chile: Who Annuityizes and Why?" *Journal of Pension Economics and Finance*, Vol. 5, No. 2, 2006; available at <http://www.estellejames.com/downloads/payout-chile.pdf>.

<sup>2</sup> If the individual has other sources of incomes, such as wages or a pension from the old public pension system, this may invalidate his eligibility for the MPG. However, it is not clear that this means-test is vigorously enforced.

<sup>3</sup> Surviving widows of disabled workers were originally entitled to 60 percent of the MPG, but now receive 100 percent of the MPG.

is due to death or appeals), and 93 percent of these are accepted as permanently disabled.<sup>14</sup> [See Figure I.]

**Appealing Disability Determinations.** Traditional public systems usually do not allow agencies to appeal against approved claims; they only allow workers to appeal denials of disability status. As a result, their costs are commensurately higher, all else being equal.<sup>15</sup> In Chile, both AFPs and workers can appeal the decisions of the Regional Medical Boards to a Central Board.

In 2004, AFPs appealed more than one-quarter (26 percent) of the disability claims that were approved provisionally and 18 percent of permanent approved claims. One-third of these appeals were successful, reducing the portion of claimants who receive permanent disability benefits by about 8 percent.<sup>16</sup> [See Figure I.]

**Insurance eligibility.** Almost all of these appeals involved workers who were likely to qualify for insurance. AFP representatives have the contribution records needed to determine whether or not a worker qualifies for insurance. They have no reason to spend resources questioning or appealing noninsured claims. The Medical Boards also have little incentive to deny the claims of noninsured workers, since at first the workers simply get early access to their own savings. These factors may contribute to the growing proportion of those certified as disabled who aren't insured, many of whom will eventually become candidates for the MPG.

**Claims that Result in Insured Permanent Disability Benefits.** As a result of the first and second assessments, the appeals process and eligibility evaluations, only a small percentage of initial claims result in insurance-funded permanent total or partial disability benefits. Figure I shows the projected disposition of claims from 2004, based on data from the Association of AFPs.

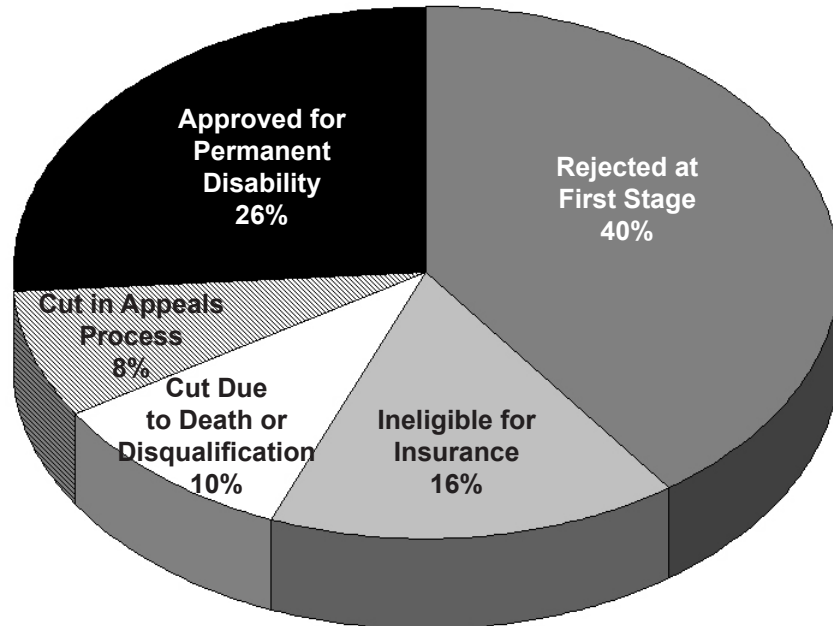
- About 40 percent of all disability claims were rejected at the first stage.
- Another 10 percent were cut due to death during the provisional stage or rejection upon evaluation for permanent status.
- Appeals cut another 8 percent of claims.
- Approximately 16 percent of claimants were found to be ineligible for insurance.<sup>17</sup>

Thus, only 26 percent of original claimants are projected to be permanently disabled and insured. The remainder are not considered disabled or, if disabled, get access to their own retirement savings but not to the insurance top-up. Among those disabled and insured, one quarter are only partially disabled and get only a 50 percent benefit. Many have a reference wage that is far less than their full working wage (because they have not contributed for some of the prior 10 years) and therefore a benefit that is far less than 70 percent (or 50 percent) of their full working wage. A major role in containing these costs

*“Pension funds participate in disability assessments and frequently appeal disability claims.”*

FIGURE I

## Disposition of Disability Insurance Claims, 2004



Source: "Sistema de Calificacion de Invalidez: Informe Estadistico," Association of AFPs, 2004.

*"About a quarter of claims result in permanent disability insurance coverage."*

is played by the AFPs, who actively participate in the assessment procedure, help set the rules, have a vested interest in enforcing them, and use their Association to keep careful track of their success.

**Conflicting Work Incentives of Provisional and Permanent Disability Status.** Chilean workers receiving provisional disability benefits may continue to work; but, if they do, they must keep contributing to social security. This weakens their incentive to work. If they are eventually granted permanent total disability status, as most are, the greater personal account balance will reduce the payment from insurance without increasing their total pension.<sup>18</sup> In effect, their entire contribution during temporary disability is a pure tax to them.

However, once a worker is granted permanent disability status, he keeps it regardless of whether or not he works. This contrasts with many other countries where, eventually, individuals who work are taken off the disability rolls. In this sense, the Chilean disability system encourages work, benefiting the individual, the system and the economy.

## How Adverse Selection Is Reduced

In PAYGO systems, workers often have an incentive to claim disability because their disability benefits start earlier than or exceed their normal retire-

ment benefits. In Chile, prefunding through account ownership reduces this incentive because workers eventually get their own money regardless of their disability status. Although other features of the Chilean system encourage some workers to seek disability instead of retirement benefits, or to qualify for insured status by timing their participation in the system to increase their net benefits, the system contains safeguards against such costly behavior.

**Adverse Selection Based on the Risk of Disability.** Adverse selection results when workers with a higher risk of disability become insured and file claims while healthy workers avoid paying into the system. This could potentially be a big problem in Chile. On average, Chilean workers contribute for about 60 percent of their potential working lives; the rest of the time they are out of the labor force, self-employed or in the informal sector.<sup>19</sup> Participation in the system by the self-employed and independent contractors is voluntary. Healthy workers can avoid contributing by working in the self-employed or informal sector, and move to the formal employment sector if a disability claim seems likely. This could raise insurance costs substantially.

**Adverse Selection by Workers with Small Account Balances and Large Top-Up.** Workers approaching old age who have contributed only a few years, who therefore have only small retirement accounts, also have a strong incentive to re-enter the contributory system and apply for disability benefits. They may not have enough savings to get a 70 percent wage replacement rate on the basis of normal retirement. However, if they qualify for disability insurance because they are currently contributing, they could receive the 70 percent wage replacement rate guaranteed to disabled workers, which is much more than their own account balances would support:

- To fund retirement benefits equal to the 70 percent replacement rate offered by the disability system, an individual who has contributed for the last 20 years and wishes to retire at age 60 would need an annual rate of return of more than 11 percent.
- A person who has contributed only for the last 10 years would need a 23 percent rate of return.

Neither of these rates of return are likely, and they exceed the average annual 10 percent rate of return above inflation that the AFPs have earned to date. Thus, many individuals who have not contributed throughout their adult lives will fare better by contributing and applying for disability benefits. In contrast, workers with large accounts don't gain from disability benefits, and may try to stop contributing as soon as possible. This is a kind of adverse selection, since it leaves a disproportionate number of individuals in the system who will require a large top-up, if they should become disabled.

**AFPs and Adverse Selection.** In traditional systems it is sometimes difficult to avoid strategic behavior by high-risk individuals or by individuals with only a few years of contributions. Eligibility conditions for insurance

*“Workers with a high risk of disability and small accounts have an incentive to enter the system and claim the higher disability benefits.”*

*“Chile holds these incentives in check by monitoring and enforcing rules.”*

*“Workers must contribute regularly for 10 years to receive disability benefits equal to 70 percent of their full, average wage.”*

were not well enforced in the past in Latin America and many other countries due to poor record-keeping and incentives facing public agencies. In Chile, AFPs combat adverse selection by monitoring and enforcing insurance eligibility rules. They keep the contribution records of affiliated workers and thus can ensure that they have contributed long enough to be eligible for disability insurance.

**How the Reference Wage Discourages Strategic Behavior.** Another way the Chilean system discourages strategic behavior by workers with irregular contribution histories is by setting a low reference wage. The reference wage is used to determine a worker’s wage that benefits will replace. It is based on a worker’s average wage during the last 10 years. For each of the last 10 years a worker has not contributed to the system, a zero is averaged in, lowering his reference wage and benefit, even if he is eligible for disability insurance. For example:

- The wage replacement rate for a steady worker who becomes disabled is 70 percent, but a worker who contributed only 60 percent of the last 10 years would receive only 42 percent of his working wage (60 percent of 70 percent).<sup>20</sup>
- The widow of an average disabled beneficiary would get 60 percent of his benefit, or 25 percent of the wage he got when working (60 percent of 42 percent).

AFPs use their records to ensure that the rules defining the reference wage are strictly applied, making it less advantageous for a worker who has not contributed for all of the preceding 10 years to apply for disability insurance. Thus adverse selection is diminished. Even if a worker successfully applies, the lower reference wage saves the system money. Of course, this also means many individuals get low benefits, which the government may end up subsidizing through the minimum pension guarantee.

**Positive Selection by AFPs.** One way AFPs keep disability costs down, according to industry representatives, is by attracting and retaining workers with low disability risks while avoiding high-risk ones—replacing adverse selection by positive selection. AFPs are not permitted to exclude workers who want to affiliate but they can encourage or discourage certain workers from affiliating by their choice of location, sales efforts and fee structure.<sup>21</sup> This selection process reduces an AFP’s cost. It does not reduce costs for the system as a whole — it simply shifts costs from one AFP to another — if it does not change total system membership. However, it will reduce system costs if these efforts increase coverage of low-risk workers. Also, if different AFPs follow different strategies, or are more effective than others, this can make it difficult for some workers to get into the AFP of their choice. High-risk workers may end up pooled together in AFPs with high fees, low service or low profits — thereby re-introducing differentiated fees. These are likely

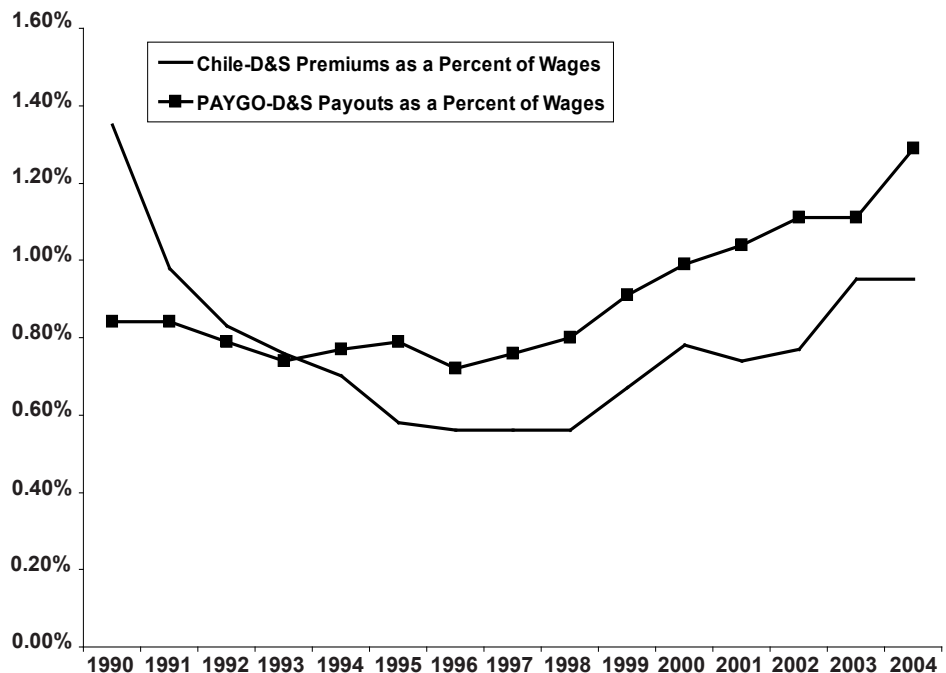
to be the older, larger AFPs, which are left with their old clientele through inertia. In contrast, the newer AFPs try to cream the better risks, using data that were not originally available. Data on AFP behavior suggest that they are also the AFPs most likely to keep system costs down by fighting false claims efficiently.

## The Chilean System versus PAYGO

In addition to the cost reductions stemming from incentives faced by AFPs, further long-run economies are achieved by prefunding in Chile. Some of the prefunding takes place through the retirement accounts, which are used to pay part of the disability benefit. In effect, the account does double duty, covering disability as well as retirement at no additional cost. Prefunding also takes place when a top-up is added to the account of a disabled worker, so that the account is sufficient to finance a lifetime annuity. In the long run, the Chilean approach results in lower annual fees than a PAYGO system would, for equivalent benefits.

**Evolution of Costs in Chile over Time.** Figure II compares total disability benefits paid out in Chile with insurance fees for the top-up from 1990 to 2004. Both numbers are given as a percentage of the total wages covered.

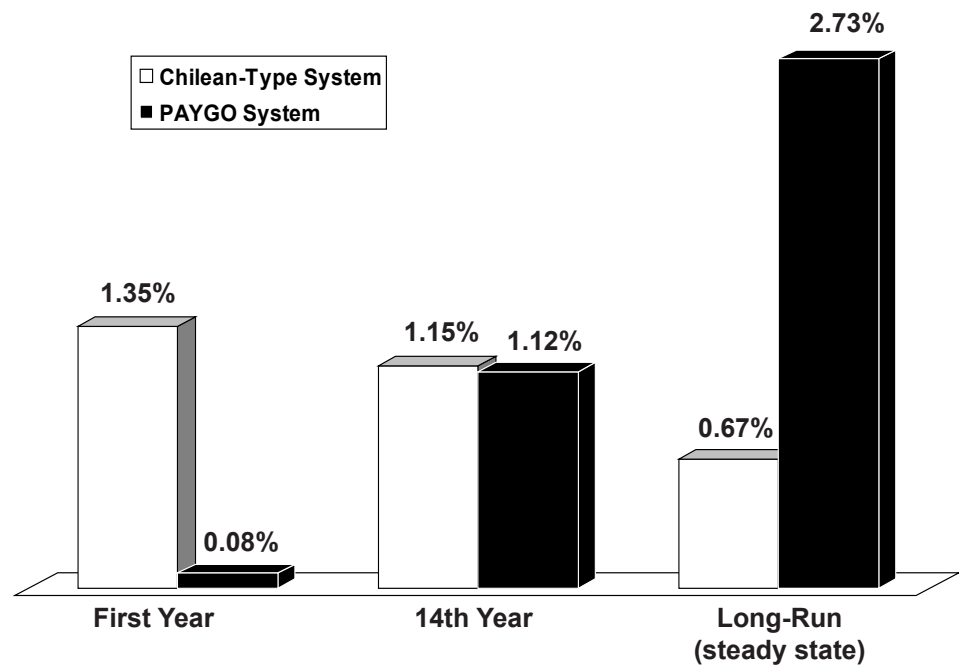
**FIGURE II**  
**Insurance Fees versus Payouts in Chile**  
 (percent of wages, 1990-2004)



*“Insurance costs fell below benefit payouts as workers’ accounts grew.”*

FIGURE III

### Simulated Disability Insurance Fees in a Chilean-Type System versus a PAYGO\* System



\* Calculated by the authors based on Chilean population structure and age-specific incidence of permanent disability, with a 10 percent contribution rate to individual accounts, 4.5 percent rate of return and 2 percent rate of wage growth in the Chilean-type scheme. Costs are given for permanent disability only.

*“In the long run, insurance fees in a PAYGO system will be four times as much as fees under the prefunded Chilean system.”*

Total disability benefits reveal what the cost to workers would have been if the system were PAYGO. When the prefunded Chilean retirement and disability system was young, annual insurance fees were much higher than benefits paid out because individual accounts were small and the insurance fee had to finance reserves for a lifetime of annuity payouts.<sup>22</sup> Today, insurance fees are much smaller than payouts to current beneficiaries. Payouts have gone up due to the growth in the number of individuals receiving disability benefits, but insurance costs have gone down because an increasing share of benefits are funded from workers' retirement accounts.

**Simulated Costs in a Chilean-Type System versus a PAYGO System.** Paying benefits on a PAYGO basis requires annual contributions equal to the total annual benefit payout. Furthermore, as a PAYGO system matures, the stock of beneficiaries increases relative to the flow of newly disabled workers. As a result, system costs rise and a higher contribution rate is required. This contrasts with a Chilean-type system in which annual insurance costs must only cover the top-up for newly disabled workers and will fall as the system matures and the personal accounts grow in size. A simulation of these

contrasting patterns of costs is shown in Figure III. The model (summarized in the Appendix) shows that for two systems with the same benefits, workers and wages:<sup>23</sup>

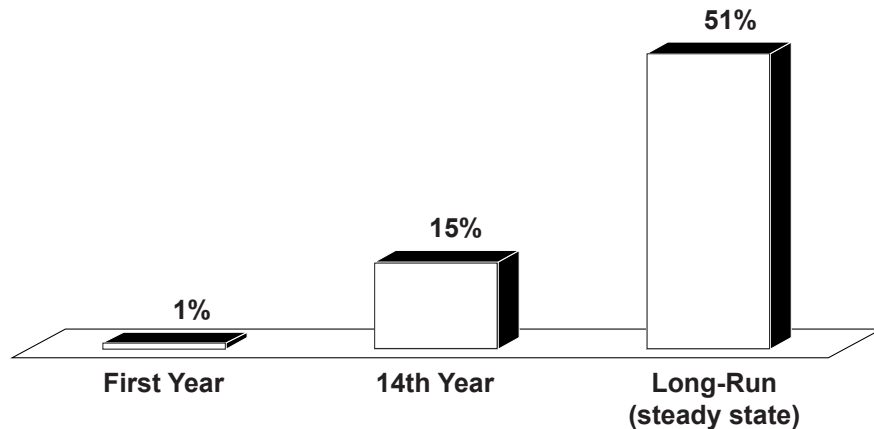
- In the first year of a Chilean-type system, insurance costs amount to 1.35 percent of wages, compared to costs of only 0.08 percent of wages in a PAYGO system.
- In year 14 these annual costs are both about 1.1 percent.
- But in the long run (steady state), total costs in a Chilean-type system fall to 0.67 percent of wages, whereas total costs for a PAYGO system would be four times as much, or 2.73 percent of wages.

Part of the reason for this dramatic fall in costs in a Chilean-type scheme is that accounts grow and cover a larger share of the total disability annuity costs as the system matures. Figure IV shows that:

- In the first year, employee accounts cover just 1 percent of the system’s disability annuity costs.
- By the 14th year, employee accounts cover 15 percent of the system’s disability annuity costs.
- In the very long-run, employee accounts cover more than half of the system’s disability annuity costs.

Projected investment earnings by AFPs or insurance companies during the payout stage will cover another quarter of the cost. Thus the annual cost of disability insurance in a Chilean-type scheme is only 25 percent of what it would be in a PAYGO system with the same benefits, in the long run.

**FIGURE IV**  
**Simulated Percentage of System Annuity Costs Covered by Personal Accounts in a Chilean-Type Scheme**



*“Personal retirement accounts will eventually cover half the cost of disability annuities.”*



Since the incidence of disability is higher for older workers, population aging will lead to higher disability rates and costs in both a Chilean and a PAYGO system. However, the costs in a Chilean scheme will be partially offset by the increasing size of the workers' accounts as they age. Thus, as workers live longer, costs will not rise as much as they will in a PAYGO system.

*"Countries that adopted the Chilean model have lower disability costs than countries with traditional systems."*

## Comparisons between Chile and other Countries

Partially as a result of prefunding plus the efforts of AFPs to constrain successful claims, disability costs and rates in Chile are much lower than in countries with more traditional systems.<sup>24</sup>

**Actual Costs in Chile versus Other Countries.** Consistent with the simulations, fees for disability and survivors' insurance in Chile are strikingly lower than in countries with pure PAYGO systems:

- Payroll taxes for Social Security disability benefits alone are 1.8 percent of wages in the United States — but this only covers benefits up to the normal retirement age, and the program is running into financial difficulties.
- In most European countries, disability costs exceed 3 percent wages, and are as high as 10 percent of wages in some high cost countries (such as Poland and the Netherlands).<sup>25</sup>
- By contrast, in other Latin American countries that adopted the Chilean model, D&S fees range from 0.9 percent to 1.7 percent of wages.<sup>26</sup>

**Disability Rates in Chile versus Other Countries.** Additionally, in part because of the cost-control measures implemented by the AFPs, Chile has much lower age-specific rates of disability among insured workers than developed countries with pure public systems. For example, among those most likely to become disabled, workers aged 45 to 54 years:

- In 1999, 2.9 per 1,000 insured 45-to-54-year-old workers were newly classified as disabled in Chile, less than half the rate in the United States (7.8 per 1,000) and less than one-third the rate in OECD as a whole (8.6 per 1,000).<sup>27</sup> [See Table I.]
- For insured workers of all ages, 1 per 1,000 were newly classified as disabled in Chile in 2004, compared with 3 to 5 per 1,000 in the United States over the past two decades.<sup>28</sup>

**Wage Replacement Rates in Chile versus Other Countries.** The cost savings in the Chilean system are not due to unusually low wage replacement rates. In fact, the 70 percent wage replacement rate for a disabled insured worker in Chile is higher than in many other countries. Although Chile's

TABLE I

## Rate of New Disability in Chile Compared with the United States and OECD (per 1,000 persons, 1999)

<u>Age Group</u>	<u>20-34</u>	<u>35-44</u>	<u>45-54</u>	<u>55-59</u>	<u>60-64</u>
Chile	.2	.9	2.9	7.2	12.3
US	2.7	4.5	7.8	13.9	12.8
OECD	2.3	4.2	8.6	14.9	14.1

*“Fewer insured workers are certified as disabled in Chile than in developed countries.”*

Notes: Chilean data calculated by the authors from claims and assessment data supplied by the Association of AFPs, and contributor and member data supplied by the SAF. Only disabled workers who are insured are included — in 1999 this was about 70% of those who were granted disabled status. Inflow to temporary disability status is given; inflow to permanent disability status would be about three-fourths as large in Chile, depending on age. Ratios are given as % of [(members + contributors)/2] since the insured population includes some affiliated individuals who are not currently contributing.

OECD numbers are disabled beneficiaries as a percentage of population in that age group, minus the stock of people in that age group who are already on disability benefits. The denominator includes some people who are not eligible for insurance. If this definition were used for Chile, Chile's disability inflow rate would be much lower than that given above.

Source: Organization for Economic Cooperation and Development, *Transforming Disability into Ability* (Paris: OECD Press, 2003), page 81.

rate is lower than in the Netherlands or Sweden, it is higher than the United States or United Kingdom.<sup>29</sup>

- In the United States and United Kingdom, the average wage replacement rate for disability is 24 percent; Japan, Australia and Canada also have rates below 30 percent.
- Sweden, Italy, the Netherlands and Spain have the highest average replacement rates for the disabled, exceeding 70 percent.

However, as noted above, many disabled Chilean workers get less than 70 percent because they haven't worked regularly for the last 10 years, and in the Anglo-Saxon countries public disability benefits are sometimes supplemented by private disability insurance purchased by employers.

**Problems and Challenges for Workers in a Chilean System.** The gains by workers in Chile have come with problems, some of which do not occur in traditional systems.

First, in a funded system that guarantees a defined benefit, the group term-insurance premium is very sensitive to the interest rate, so the contribution rate needed to cover this cost varies from year to year. This is because the amount coming from investment earnings falls as the interest rate falls,

and thus the premium needed to finance a given annuity payout rises. Recent decreases in interest rates are likely to raise insurance fees substantially. This does not occur in a PAYGO system that has no investment component.

Second, if the insurance fee is a uniform percentage of wages, workers with low disability and survivor probabilities — the young, single and women — subsidize other groups. As a result, they may try to stay out of the formal contributory system, then re-enter when they are more likely to become disabled and receive subsidies (when older and married), thereby increasing the required insurance premium for everyone. This occurs both in both funded and PAYGO systems, unless insurance rates are differentiated by risk category.

Third, the insurance premiums a worker pays depends on the average disability risk of the workers affiliated with his AFP. Thus AFPs will try to attract (or “cream”) groups that have a low incidence of disability, thereby allowing them to charge low insurance fees and/or to earn higher profits. Creaming, however, means that the workers in other AFPs are higher risk, on average, and their insurance premiums are higher. Creaming also makes it harder for workers in high-risk groups to join the AFP of their choice. These problems do not occur in national systems, where all workers are in the same insurance pool.

Fourth, the potentially high cost of the minimum pension guarantee looms. In recent years, the incidence of successful claims for full and insured disability has been constrained, while claims for partial and uninsured disability have expanded. The data indicate that a high proportion of disabled individuals fall into these low-benefit categories and will eventually receive a public subsidy.

## Lessons for Other Countries

This paper has focused on the impact of private incentives and prefunding on disability insurance costs in Chile. Disability claims and costs seem to be relatively low compared with other countries. Further research is needed to determine whether this process results in more accurate medical evaluations and whether Chile has chosen the right trade-off between benefits and costs.

Following are three ways that prefunded disability benefits can be integrated into individual retirement account systems, while overcoming some of the problems mentioned above.

**Model 1: Prefunding and Private Insurance with Risk-Pooling and Competitive Bidding.** Countries with individual accounts could get the benefits of prefunding and private participation while reducing the risk of creaming and the interest-rate sensitivity mentioned above. They could place workers in one large risk pool and auction off the provision of disability term insurance to a private firm every 3 to 5 years in a competitive bidding process. The entire contract would then go to one company (or a small number of companies to

*“Option 1: Insurers could bid to provide all workers with term disability insurance.”*

which workers are randomly assigned), instead of the decentralized provision in Chile. The company winning the auction would have the task of topping up disabled workers' account balances to finance the defined disability benefit.

Both publicly-appointed experts and insurance company representatives would participate in the assessment process, similar to the procedure in Chile. But, since everyone would be in the same pool, this company would not be able to select workers and, since the contract would be long-term, fee fluctuations tied to the interest rate would be smoothed. In the long run, annual fees would continue to be kept low by investment returns on the funds, private monitoring of the assessment process, and the economies of scale and bargaining power stemming from the competitive bidding process.<sup>30</sup>

However, a monopoly insurance company chosen by AFPs might have little incentive to monitor costs carefully, hoping to cover them by higher fees in the next round of bidding. AFPs would also have less incentive to control costs, since any savings would be shared among the entire AFP and/or insurance industry. Thus, some of the savings due to the incentives of AFPs to control costs would be lost. Additionally, since they would not be able to change their fees each year, insurance companies might charge a high-risk premium to compensate for interest-rate smoothing over the contract period. In that case, the shift toward a single pool and long term contract might reduce selection by AFPs but might also reduce oversight and raise costs overall. Notably, the Chilean government is currently proposing the adoption of such a system, apparently trading off cost minimization under the current system for other goals, such as uniform prices across individuals and through time.

**Model 2: Prefunding with Private Provision, Only Until Normal Retirement Age.** As a variation on this model, insurance companies might finance the disability pension only for a fixed term, until the normal retirement age (say, age 65), at which point the old age benefit would take over. This switch to normal retirement age is roughly consistent with current practice in the United States. In this case, the individual's money would remain in his account, collecting interest, until age 65. At that point, the disability annuity would cease and he would be treated similarly to normal retirement pensioners.

This variation would imply less uncertainty for the insurance company and less incentive for older workers to apply for disability benefits, because the disability annuity would cover a shorter time period. Both of these would reduce disability costs. But some workers would see their benefits fall substantially when they reach normal retirement age, if the old age pension is lower than the disability pension. If part of the normal retirement pension is PAYGO, this variation would also imply a smaller shift to prefunding, therefore smaller short-run transition costs. However, in the long-run annual cost saving would be lower, because prefunding and investment earnings are lower for the system as a whole.

*“Option 2: Insurance could cover the disabled only up to the normal retirement age.”*

*“Option 3: Disability benefits paid by a government agency on a PAYGO basis, cost more in the long- run.”*

**Model 3: Public Provision, Largely PAYGO.** The third option is to use a government agency, rather than private companies, to provide disability benefits — even though a country has a system of individual retirement accounts. A government agency would take the money in the retirement accounts of disabled workers and pay them a defined benefit. This system would be partially prefunded by the money in the accounts, but the rest of the benefit would be financed on a PAYGO basis. Because of the smaller amount of prefunding, short-run costs would be lower and long-run costs higher than in a Chilean-type scheme. Costs would be less sensitive to interest rate variations, but more sensitive to population aging, than a fully funded scheme. Among countries with individual account systems, this method was used in Hungary and Croatia to avoid transition costs. Latvia, Estonia and Sweden use this method only until normal retirement age, at which point disabled workers are treated like normal retirees.

The reliance on public management does not provide the cost controls that come from private participation in the assessment procedure. Nevertheless, it might be possible to adapt some elements of the Chilean assessment process. For example, the public agency responsible for the program could be given the right to appeal approved cases, or to oppose claimants’ appeals, represented by lawyers who have incentives to win cases. This should increase the probability that both sides would be presented — the argument for paying the benefit and, in questionable cases, the argument for denial — while leaving the final decision to an impartial court or body of experts.<sup>31</sup>

## Conclusion

Countries around the world are faced with rising costs of old age security programs. In many countries, such as the United States, disability expenditures have been rising even faster than old age expenditures. The experience of Chile suggests that these costs can be contained in the long run by prefunding, by private participation in the assessment procedure and, possibly, by processes that mimic private participation. Further research is needed to determine whether more accurate evaluations are made by this approach and whether Chile has chosen the right balance between benefits and costs. In the meantime, countries that already consider their costs excessive should seriously consider how these economies and incentives can be incorporated into their systems.

NOTE: Nothing written here should be construed as necessarily reflecting the views of the National Center for Policy Analysis or as an attempt to aid or hinder the passage of any bill before Congress.

## Notes

<sup>1</sup> This paper is based on Estelle James, Augusto Iglesias and Alejandro Cox Edwards, “Disability Insurance with Prefunding and Private Participation: The Chilean Model,” forthcoming.

<sup>2</sup> David Autor and Mark C. Duggan, “The Growth in the Social Security Disability Rolls: A Fiscal Crisis Unfolding,” *Journal of Economic Perspectives*, Vol. 20, No. 3, summer 2006, pages 71-96.

<sup>3</sup> For workers who have not been in the social security system for 10 years, wages are averaged over a shorter period, with a minimum of 24 months.

<sup>4</sup> The annuity lasts the entire lifetime, thereby providing longevity insurance. The programmed withdrawal has the same lifetime expected present value as the annuity but payouts are more front-loaded and uncertain and the money may be used up before the person dies. For more details on payout modes see Estelle James, Guillermo Martinez and Augusto Iglesias, “The Payout Stage in Chile: Who Annuityizes and Why?” *Journal of Pension Economics and Finance*, Vol. 5, No. 2, 2006; available at <http://www.estellejames.com/downloads/payout-chile.pdf>.

<sup>5</sup> The typical policy shares the risk between the AFP and the insurer: The AFP covers disability costs for the group up to a contractually agreed-upon maximum (such as 1 percent of wages), while the insurance company takes over once the maximum cost for the group has been reached. If disability costs are below the ceiling, the insurer and AFP share the savings. This limits the risk for the AFP and covers extreme costs.

<sup>6</sup> The breakdown between administrative costs and disability insurance and survivors’ insurance is based on data analysis by the authors.

<sup>7</sup> The Medical Boards have the discretion to increase this percentage in some cases. The Medical Boards use specified “complementary factors” in the case of older, low-income members or when the member loses the ability to perform his or her normal job.

<sup>8</sup> “Sistema de Calificación de Invalidez: Informe Estadístico,” Association of AFPs, 2004.

<sup>9</sup> To be eligible for disability benefits, a worker must either 1) be working and contributing at the time of the claim or 2) have contributed during the last 12 months and also paid at least six contributions in the year immediately preceding the last registered contribution, or 3) (if self-employed) have made at least one contribution in the calendar month before the date of the claim.

<sup>10</sup> For example, 3 years of contributions are typically required in Latin America, 5 years in OECD countries. In the United States the applicant must have worked in 5 of the last 10 years and cannot be working currently. Organization for Economic Cooperation and Development, *Transforming Disability into Ability* (Paris: OECD Press, 2003); Carlos Grushka and Gustavo Demarco, “Disability Pensions and Social Security Reform Analysis of the Latin American Experience,” World Bank, Social Protection Discussion Paper No. 0325, December 2003; Emily Andrews, “Disability Insurance: Programs and Practice,” World Bank, Social Protection Discussion Paper, April 1998; available at <http://info.worldbank.org/etools/docs/library/77186/november2003/readings/disability.pdf>.

<sup>11</sup> This is true of nondisabled retirees as well. If those on programmed withdrawals exhaust their accounts, the state pays their pension at the MPG level, providing they meet the eligibility requirements. Retirees whose accumulations are not large enough to purchase an annuity greater than the MPG initially must take programmed withdrawals and spend down their accounts. Disabled retirees who don’t qualify for the top-up are more likely to be in this situation. See Estelle James, Guillermo Martinez and Augusto Iglesias, “The Payout Stage in Chile: Who Annuityizes and Why?”; and Alejandra Edwards and Estelle James, “Pension Reform and Postponed Retirement: Evidence from Chile,” University of Michigan Research Retirement Center, Working Paper No. 2006-147, December 2006; available at <http://deepblue.lib.umich.edu/bitstream/2027.42/49333/3/wp147.pdf.txt>.

<sup>12</sup> For example, suppose the AFP starts out with a total fee of 2.4 percent of the worker’s wage and an actual cost of 2 percent, half of which is the insurance cost, thereby earning the 0.4 percent difference as profit. If it cuts the insurance cost to 0.8 percent and continues charging the same fee (because that is the market price charged by its competitors), its profits increase by 50 percent:  $(2 \text{ percent} - 1.8 \text{ percent})/0.4 \text{ percent} = 50 \text{ percent}$ .

<sup>13</sup> Applications are rejected if individuals have lost less than 50 percent of their working capacity or are disabled by a labor accident or occupational illness, in which case the disability is covered by a different program.

<sup>14</sup> This permanency of disability status is quite common in other countries too, either on a formal or de facto basis — movement out of disability status is rare. See OECD, *Transforming Disability into Ability* (Paris: OECD Press, 2003); and “Sistema de Calificación de Invalidez: Informe Estadístico,” Association of AFPs, 2004. The additional payment to cover the cost of

the life annuity is made when the disability is certified as permanent. During the three-year period of temporary disability the AFP pays the defined benefit directly to the individual as a “provisional pension.” In the few cases where the permanent claim is rejected, the AFP must make the contributions to the worker’s account that he would have made during the three years of temporary disability, to maintain the size of his eventual old age pension.

<sup>15</sup> For example, in the United States appeals can only be brought by workers whose initial claims have been denied, so appeals inevitably increase approved cases. In 2000, only 38 percent of claims were approved initially, but more than half of those denied benefits appealed so the proportion ultimately approved was 55 percent. It is possible that initial decisions are more negative than they would be otherwise, knowing that one-sided reversals will take place subsequently. Data are not available on how many appeals against denials were made by worker-claimants in Chile. “Charting the Future of Social Security’s Disability Programs: The Need for Fundamental Change,” U.S. Social Security Advisory Board, January 2001, pages 8, 18, 19; available at <http://www.ssab.gov/Publications/Disability/disabilitywhitepap.pdf>.

<sup>16</sup> “Sistema de Calificación de Invalidez: Informe Estadístico,” Association of AFPs, 2004.

<sup>17</sup> Calculations by the authors based on “Sistema de Calificación de Invalidez: Informe Estadístico,” Association of AFPs, 2004.

<sup>18</sup> Although the Medical Board does not require information about employment during the transitional period, the AFP usually informs them in cases where work has continued. Thus, work is not necessarily held against the individual in the reassessment procedure, but it may be.

<sup>19</sup> Participation in the social security system varies widely around the mean. See Solange Berstein, Guillermo Larrain and Francisco Pino, “Cobertura, Densidad y Pensiones en Chile. Proyección a 20 años plazo,” Superintendencia de AFP, Working Paper No. 12, November 2005; available at <http://www.safp.cl/files/doctrab/DT00012.pdf>; Alberto Arenas de Mesa, Jere Behrman and David Bravo, “Characteristics of and Determinants of the Density of Contributions in a Private Social Security System,” University of Michigan Retirement Research Center, Working Paper No. 2004-077, February 2004; available at <http://www.mrrc.isr.umich.edu/publications/Papers/pdf/wp077.pdf>.

<sup>20</sup> The definition of the reference wage creates somewhat questionable disparities among individuals. For example, an individual who worked steadily for 20 years, then intermittently for 10 years, has a larger account but gets a lower disability pension than a person who worked intermittently for 20 years, then steadily for 10 years, assuming they both have the same wage and retire on disability at the same age. See Emily Andrews, “Disability Insurance: Programs and Practice,” World Bank, Social Protection Discussion Paper, April 1998; available at <http://info.worldbank.org/etools/docs/library/77186/november2003/readings/disability.pdf>; “Charting the Future of Social Security’s Disability Programs: The Need for Fundamental Change,” U.S. Social Security Advisory Board, January 2001; available at <http://www.ssab.gov/Publications/Disability/disabilitywhitepap.pdf>.

<sup>21</sup> Some AFPs have acquired the reputation of doing this and also of fighting claims vigorously. This reputation may induce affiliated workers who are contemplating filing a claim to switch to another AFP.

<sup>22</sup> Interestingly, Eastern European countries which followed the Chilean model for normal retirement did not adopt the Chilean disability system in order to avoid these initial transition costs as well as the difficulties in adjusting assessment rules to private standards. See Agnieszka Chlon-Dominczak, “Evaluation of Reform Experiences in Eastern Europe,” International Federation of Pension Funds Administrators, May 2003; available at [http://www.fiap.cl/p4\\_fiap\\_eng/antialone.html?page=http://www.fiap.cl/p4\\_fiap\\_eng/site/edic/base/part/articles.html](http://www.fiap.cl/p4_fiap_eng/antialone.html?page=http://www.fiap.cl/p4_fiap_eng/site/edic/base/part/articles.html).

<sup>23</sup> The simulation assumes workers enter the labor force at age 20 and work until retirement or disability, with a 10 percent contribution to the retirement account, a 4.5 percent rate of return and wage growth of 2 percent annually. The PAYGO and Chilean systems are assumed to have the same population age structure and age-specific incidence of disability.

<sup>24</sup> Many other factors contribute to these differences in disability rates and fees, including some unrelated to the way disabilities are assessed or benefits financed. These include, in particular, the age structure of the population, the definition of disability, the generosity and indexation of benefits, and whether they cover the worker until the normal retirement age or death.

<sup>25</sup> “Charting the Future of Social Security’s Disability Programs: The Need for Fundamental Change,” U.S. Social Security Advisory Board, January 2001; and Emily Andrews, “Disability Insurance: Programs and Practice.”

<sup>26</sup> AIOS, “Boletín Estadístico,” La Asociación Internacional de Organismos de Supervisión de Fondos de Pensiones, No. 13, June 2005. Available at <http://www.aiosfp.org>.

<sup>27</sup> The authors approximate the insured population in Chile as consisting of an average of contributors and affiliated workers, since all contributors plus some noncontributing affiliates are insured. The OECD numbers treat all individuals in the age group as if they were insured. If this definition were used for Chile, its disability rate would be much lower than that given above, because of the wide disparity between the number of residents and number of insured persons. OECD, *Transforming Disability into Ability* (Paris: OECD Press, 2003).

<sup>28</sup> “Annual Report,” U.S. Social Security Board of Trustees, 2005. A comparison of disability pension rates in the new and old Chilean systems, using the Cox proportional hazard model, shows that, among 40-to-65-year-olds, the proportion of nonpensioned participants who become newly disabled at any given age is 60 percent to 70 percent lower in the new system. For example, a single man in the old system had a 0.5 percent chance of becoming newly disabled at age 54, but in the new system this probability falls to 0.18 percent. In the old system, the probability of becoming newly disabled peaked at 1.5 percent for a 58-year-old single man, but in the new system this man had a hazard rate of only 0.5 percent. See Estelle James, Augusto Iglesias and Alejandra Cox Edwards, “Disability Insurance with Prefunding and Private Participation: The Chilean Model,” forthcoming.

<sup>29</sup> Emily Andrews, “Disability Insurance: Programs and Practice,” page 17. Note that different methods of calculating replacement rates may be used for different countries so these rates are not completely comparable.

<sup>30</sup> Interestingly, the new unemployment insurance system instituted by Chile, which also uses a combination of individual accounts and insurance, puts all workers into a single pool and auctions off the rights to handle the insurance to a single provider — perhaps to avoid selection and related problems. The bidder that won: a consortium of AFPs.

<sup>31</sup> For similar recommendations see “Charting the Future of Social Security’s Disability Programs: The Need for Fundamental Change;” also see David H. Autor and Mark G. Duggan, “The Growth in the Social Security Disability Rolls: A Fiscal Crisis Unfolding,” *Journal of Economic Perspectives*, Vol. 20, No. 3, Summer 2006, pages 71-96.



## APPENDIX

**Assumptions for the Model**

A model was used in this study to compare costs and factors that influence costs in a prefunded, Chilean-type disability insurance scheme with those in a public PAYGO system, under alternative scenarios. In order to isolate the impact of prefunding, this analysis assumes the probability of disability is the same in the two systems. The analysis of cross-subsidies and incentives for selection by AFPs also flows from this model.

For simplicity, the focus is on the cost of insuring total permanent disability, the largest component of disability costs. The required fee is calculated as a percent of the wage bill, which must be charged to cover the group insurance that finances the (additional payment for the) lifetime pension for newly disabled workers. By law, this fee is levied as a uniform percentage of wages for all contributing workers in a given AFP.<sup>1</sup> To determine the break-even insurance fee, the real insurance cost across all genders and classes in the contributing labor force is summed, and divided by the AFP's total wage bill (equation 1):

$$\text{TCH} = \text{TotInsure}/\text{Wage bill} = \sum_i n_i \text{Insure}_i / \text{Wage bill}, \text{ where} \quad (1)$$

$$\text{TotInsure} = \sum_i \text{Insure}_i * n_i$$

$\text{Insure}_i$  = real insurance costs associated with an individual in gender-age class  $i$

$n_i$  = total number of individuals in class  $i$

Real insurance costs ( $\text{Insure}_i$ ) are calculated as follows (equation 2):

$$\text{Insure}_i = \text{Add}_i * \text{Prob}_i, \text{ where} \quad (2)$$

$\text{Add}_i$  = additional payment needed if an individual becomes disabled (this is simply the difference between the necessary funds to cover the defined benefit and the individual's own funds to help cover costs). This can be rewritten as:

$$\text{Add}_i = \text{NecC}_i - \text{OwnC}_i, \text{ where:}$$

$\text{NecC}_i$  = the defined benefit (DB) times the annuity factor ( $a_i$ ).<sup>2</sup>

$\text{OwnC}_i$  = the individual's accumulated contributions + investment earnings

$\text{Prob}_i$  = probability of a covered permanent disability occurring in  $i$ 's gender-age class

The balance in the individual account ( $\text{OwnC}_i$ ) depends on the worker's contributions and the market interest rate earned until age of permanent disability, summed over all years in which contributory work occurs. Contributions are based on wages, so contribution rate, initial wage rate and rate of wage growth determine the total accumulation. In the past, recognition bonds that grant credit for service in the old pension system also constituted a large part of the individual's own accumulation. However, these recognition bonds are now diminishing in importance, as most newly disabled persons today had little service prior to 1981.

By substituting equation (2) into equation (1), the total cost of insurance can be rewritten as the total inflow of newly disabled workers times the average additional payment per newly disabled worker (equation 3):

$$\text{TotInsure} = \sum_i n_i \text{Prob}_i * (\sum_i n_i \text{Prob}_i * \text{Add}_i / \sum_i n_i \text{Prob}_i) \quad (3)$$

In contrast, the required contribution rate in a PAYGO system ( $T_{\text{PAYGO}}$ ) equals the annual payouts for the total stock of disabled beneficiaries/covered wage bill (equation 4):

$$T_{\text{PAYGO}} = \text{avDB} * \text{StkDis} / \text{Wage bill}, \text{ where:} \quad (4)$$

avDB = average defined benefit per existing disabled worker

StkDis = the stock of beneficiaries

*Comparisons of PAYGO costs and insurance fees in a Chilean-type scheme.* A comparison of equations (3) and (4) shows that the relative cost of a Chilean-type disability insurance versus a PAYGO scheme depends on 1) the size of the expected inflow of disabled compared with the stock of existing disabled and 2) the average additional payment required to purchase a lifetime annuity for the newly disabled compared with the average annual payout to the total stock of disabled. In the early years of a new system, when the new inflow is large relative to the stock of existing beneficiaries and  $\text{Add}_i$  is large relative to the average DB because  $\text{OwnC}_i$  is small,  $T_{\text{CH}} > T_{\text{PAYGO}}$ . In the long run, however,  $T_{\text{CH}} < T_{\text{PAYGO}}$ , since the stock of disabled becomes large relative to the new inflow and the cost of the lifetime annuity is covered to a large extent by  $\text{OwnC}$ .

*Costs and Population Aging.* Population aging increases the probability of disability and the cost of disability insurance, whether in a PAYGO or prefunded system. But in a Chilean-type scheme these costs are partially offset by additional money in the accounts of the older workers. Insurance fees increase, but not as much as they would under PAYGO. This makes Chile's system less sensitive to demographic shocks.

*System Sensitivity to Interest Rates.* Prefunding the defined benefit makes the Chilean system very sensitive to interest rate shocks. The total cost of the insurance policy will vary from year to year depending on interest rates in the economy, and employers and workers will have to adjust to varying contribution rate. The recent decline in interest rates has produced large increases in the annuity premium needed to finance the fixed defined benefit, and eventually this will increase insurance costs substantially.<sup>3</sup>

<sup>1</sup> For expositional simplicity, this section abstracts from differences across AFPs. It focuses on the cost of insuring permanent disability and abstracts from other insurance costs, such as provisional pensions and contributions paid back to workers who are not declared permanently disabled. The interest rate is assumed to be constant across AFPs and time and the same during the accumulation and payout stage.

<sup>2</sup> The annuity factor ( $a_i$ ) indicates by how much the specified annual payout must be multiplied in order to determine the expected present value of the lifetime pension which equals the premium needed to finance the defined benefit. It depends on interest rate regulations, relevant mortality tables, and the individual's age and gender. Since survivors of disabled beneficiaries also receive benefits, the annuity factor for married men is based on a joint pension; the wife is assumed to be 3 years younger than the husband in these calculations.

<sup>3</sup> An offsetting factor, not included in the calculations, is the cost of temporary disability, which is not prefunded and which therefore reduces the interest-rate sensitivity of the system over all. Interest rate sensitivity might be further smoothed over time by longer-term contracts between AFPs and insurance companies, but at the expense of a higher risk premium that the companies would likely demand. Employer-sponsored defined benefit retirement plans in the United States and other OECD countries try to smooth fluctuations in required contribution rates by basing charges on assumptions about very long rates of return. Experience has shown these assumptions are often wrong, and may leave the pension system under-funded. Chile avoids this problem by requiring the cost of the defined benefit to change frequently as interest rates change. The term contract between the AFP and the insurance company sets a ceiling on the share of these costs that is borne by the AFP and its members and thereby partially smoothes over 2 to 3 years. But the revised expected cost is passed back to workers when the contract is renegotiated.

## About the Authors

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## About the NCPA

The NCPA is a nonprofit, nonpartisan organization established in 1983. Its aim is to examine public policies in areas that have a significant impact on the lives of all Americans — retirement, health care, education, taxes, the economy, the environment — and to propose innovative, market-driven solutions. The NCPA seeks to unleash the power of ideas for positive change by identifying, encouraging and aggressively marketing the best scholarly research.

*Health Care Policy.* The NCPA is probably best known for developing the concept of Health Savings Accounts (HSAs), previously known as Medical Savings Accounts (MSAs). NCPA President John C. Goodman is widely acknowledged (*Wall Street Journal*, *WebMD* and the *National Journal*) as the “Father of HSAs.” NCPA research, public education and briefings for members of Congress and the White House staff helped lead Congress to approve a pilot MSA program for small businesses and the self-employed in 1996 and to vote in 1997 to allow Medicare beneficiaries to have MSAs. In 2003, as part of Medicare reform, Congress and the president made HSAs available to all nonseniors, potentially revolutionizing the entire health care industry. Health Savings Accounts now are potentially available to 250 million nonelderly Americans.

The NCPA outlined the concept of using federal tax credits to encourage private health insurance and helped formulate bipartisan proposals in both the Senate and the House. The NCPA and Blue-Cross Blue-Shield of Texas developed a plan to use money federal, state and local governments now spend on indigent health care to help the poor purchase health insurance. The SPN Medicaid Exchange, an initiative of the NCPA for the State Policy Network, is identifying and sharing the best ideas for health care reform with researchers and policymakers in every state.

*Taxes & Economic Growth.* The NCPA helped shape the progrowth approach to tax policy during the 1990s. A package of tax cuts designed by the NCPA and the U.S. Chamber of Commerce in 1991 became the core of the Contract with America in 1994. Three of the five proposals (capital gains tax cut, Roth IRA and eliminating the Social Security earnings penalty) became law. A fourth proposal — rolling back the tax on Social Security benefits — passed the House of Representatives in summer 2002. The NCPA’s proposal for an across-the-board tax cut became the centerpiece of President Bush’s tax cut proposals.

NCPA research demonstrates the benefits of shifting the tax burden on work and productive investment to consumption. An NCPA study by Boston University economist Laurence Kotlikoff analyzed three versions of a consumption tax: a flat tax, a value-added tax and a national sales tax. Based on this work, Dr. Goodman wrote a full-page editorial for *Forbes* (“A Kinder, Gentler Flat Tax”) advocating a version of the flat tax that is both progressive and fair.

A major NCPA study, *Wealth, Inheritance and the Estate Tax*, completely undermines the claim by proponents of the estate tax that it prevents the concentration of wealth in the hands of financial dynasties. Actually, the contribution of inheritances to the distribution of wealth in the United States is surprisingly small. Senate Majority Leader Bill Frist (R-TN) and Senator Jon Kyl (R-AZ) distributed a letter to their colleagues about the study. In his letter, Sen. Frist said, “I hope this report will offer you a fresh perspective on the merits of this issue. Now is the time for us to do something about the death tax.”

*Retirement Reform.* With a grant from the NCPA, economists at Texas A&M University developed a model to evaluate the future of Social Security and Medicare, working under the direction of Thomas R. Saving, who for years was one of two private-sector trustees of Social Security and Medicare.

The NCPA study *Ten Steps to Baby Boomer Retirement* shows that as 77 million baby boomers begin to retire, the nation’s institutions are totally unprepared. Promises made under Social Security, Medicare and Medicaid are completely unfunded. Private sector institutions are not doing better — millions of workers are discovering

that their defined benefit pensions are unfunded and that employers are retrenching on post-retirement health care promises.

Pension reforms signed into law include ideas to improve 401(k)s developed and proposed by the NCPA and the Brookings Institution. Among the NCPA/Brookings 401(k) reforms are automatic enrollment of employees into the companies' 401(k) plans, automatic contribution rate increases so that as workers' wages grow so do their contributions, and stronger default investment options for workers who do not make an investment choice.

The NCPA's online Social Security calculator allows visitors to discover their expected taxes and benefits and how much they would have accumulated had their taxes been invested privately.

*Environment & Energy.* The NCPA's E-Team is one of the largest collections of energy and environmental policy experts and scientists who believe that sound science, economic prosperity and protecting the environment are compatible. The team seeks to correct misinformation and promote sensible solutions to energy and environment problems. A pathbreaking 2001 NCPA study showed that the costs of the Kyoto agreement to reduce carbon emissions in developed countries would far exceed any benefits.

*Educating the next generation.* The NCPA's Debate Central is the most comprehensive online site for free information for 400,000 U.S. high school debaters. In 2006, the site drew more than one million hits per month. Debate Central received the prestigious Templeton Freedom Prize for Student Outreach.

*Promoting Ideas.* NCPA studies, ideas and experts are quoted frequently in news stories nationwide. Columns written by NCPA scholars appear regularly in national publications such as the *Wall Street Journal*, the *Washington Times*, *USA Today* and many other major-market daily newspapers, as well as on radio talk shows, on television public affairs programs, and in public policy newsletters. According to media figures from Burrelle's, more than 900,000 people daily read or hear about NCPA ideas and activities somewhere in the United States.

## What Others Say About the NCPA

*"Ofentimes, during policy debates on my staff, a smart young staffer will step up and say, 'I got this piece of evidence from the NCPA.' It helps a lot to have intellectual thought to help shape public policy in the State of Texas. I want to thank you all for what you do."*  
—George W. Bush (as governor of Texas)

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*"We know what works. It's what the NCPA talks about: limited government, economic freedom; things like health savings accounts. These things work, allowing people choices. We've seen how this created America."* —John Stossel, co-anchor ABC-TV's 20/20

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*"I don't know of any organization in America that produces better ideas with less money than the NCPA."* —Phil Gramm, former U.S. Senator

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*"Thank you . . . for advocating such radical causes as balanced budgets, limited government and tax reform, and to be able to try and bring power back to the people."* —Tommy Thompson, former Secretary of Health and Human Services

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