

**Disability Insurance with Pre-funding and Private Participation:
The Chilean Model**

by

Estelle James and Augusto Iglesias

Funded Systems: their Role in Solving the Pension Problem. FIAP. Santiago.
Chile 2008 (Conference Volume, FIAP, Varna, Bulgaria, May 2007)

Disability Insurance in an Individual Account System¹

Many countries have adopted old age systems that include individual accounts—funded, privately managed defined contribution plans. It is difficult to incorporate disability benefits into a social security system with a defined contribution component, since disabled people may not work long enough to accumulate large balances. The system might generate reasonable replacement rates for workers who contribute throughout their lifetimes, but very low replacement rates for those who become disabled when young. Yet, if disabled people continue to receive their benefits from the traditional pay-as-you-go (PAYG) system, this will take an increasingly large percentage of total social security taxes in the future. Moreover, it may encourage workers with small accumulations to apply for disability rather than old age benefits, which will raise taxpayer costs further. Beyond these problems of integration, disability is a more subjective condition than old age, and such programs are therefore prone to errors of over- or under-exclusion. The procedures used to evaluate claims can influence this balance and through it the costs and equity of the program. (see Autor and Duggan 2006).

It is important to solve these problems, since disability often takes 20-30% of total social security costs, a share that has been rising in many countries. This paper describes how countries with individual account systems have handled disability insurance, and what are some of the consequences for costs. Does the disability system use defined contributions (DC), pre-funding and private management, as in their reformed retirement schemes, or does it use defined benefits (DB), PAYG finance and public management? Which model yields the lowest cost and most accurate targeting of benefits?

Among the thirty or so countries that have introduced privately managed funded components to their old age systems, disability insurance has continued to be treated as a defined benefit, in contrast to old age insurance, which has been partially or largely shifted to defined contribution. The rationale is that young disabled workers won't have large DC accounts, so some kind of DB must be provided. However, the commonality stops there. In most European countries, disability insurance is publicly managed and financed mainly on a PAYG basis. In Eastern and Central Europe, typically, the individual surrenders his or her individual account balance and, in return, gets a PAYG financed defined benefit until death. In Sweden, Estonia and Latvia the disability pension lasts only until age 65; funds in the account are preserved and take over after age 65.

Disability insurance in Latin America differs sharply from the traditional publicly managed PAYG model:

- 1) it is largely pre-funded--through the accumulation in the retirement account and later through an additional payment made when the person becomes permanently disabled, sufficient to cover a lifetime defined benefit annuity; and

2) the disability assessment procedure includes participation by private pension funds (AFPs) and insurance companies, who finance the benefit and have a direct pecuniary interest in controlling costs and reducing adverse selection.

This paper analyzes the Latin American model, using Chile as our case in point. For reasons described below, we expect this system to lead to lower costs, and we present empirical evidence that is consistent with this expectation.

I. Disability Costs and Insurance Fees in the Chilean System vs. PAYG

This section describes the Chilean scheme and presents results of simulations of fees in a pre-funded versus a PAYG disability insurance system.

How disability insurance works in Chile—pre-funding a defined benefit

Disability insurance in Chile starts with the mandatory retirement accounts, to which each individual must contribute 10% of wages. Old age benefits depend on this defined contribution. In contrast, if a worker becomes disabled before retiring, he receives a defined benefit. This is accomplished through the private insurance market, with government providing detailed regulations and back-up guarantees.

Specifically: Each insured worker is guaranteed a benefit that is 70% of his average wage if he is totally disabled, 50% if partially disabled, indexed to inflation. During an initial three-year period of temporary disability, this benefit is paid directly by the AFP. After the provisional period, if the worker is certified as permanently disabled, the entire lifetime benefit is funded. Part of this benefit is covered by his own retirement account. The remainder is covered by a term group insurance policy, which provides the top-up (the “additional payment”) needed to finance an annuity that equals the specified defined benefit. Each AFP is required to purchase this insurance policy for its affiliates. The typical contract shares the risk: the AFP covers costs up to a ceiling and keeps most of the savings beneath that ceiling, while the insurance company takes over after the maximum rate has been reached. Survivors’ insurance for workers is covered in the same way, by the same insurance policy, in exchange for a combined D&S insurance fee that is passed on to workers by the AFP.

Thus the total future pension is fully pre-funded at the point when the individual is certified as permanently disabled—partly out of his own retirement savings and partly by the group insurance policy purchased by the AFP. The disabled worker uses these funds to purchase a lifetime annuity or a gradual withdrawal pension that follows a formula set by the regulator.

The D&S insurance fee is included in the general administrative charge that each worker pays the AFP. Each AFP sets its own fees and, apart from a small flat component, is required to charge all its affiliates the same percentage of their wage—regardless of age, gender, occupation, health status or account size. Total AFP fees currently average around 2.4%. The combined fee for the group D&S insurance is about 1% of wages, of which the disability portion is 2/3 (authors’ estimates).

A simple model for determining the group insurance premium

We developed a model that determines this fee and its evolution over time, compared with fees that would be necessary to cover annual benefits in a PAYG system that had the same number of disability beneficiaries and benefit levels. For simplicity, we focus on the cost of insuring total permanent disability, the largest component of disability costs. We calculate the fee that must be charged in a Chilean-type scheme to cover the group insurance that finances the additional payment for newly disabled workers. It depends on the number of newly disabled workers each year times the average additional payment needed to finance a lifetime defined benefit for each such person. By contrast, the break-even tax rate in a PAYG system must cover the annual payouts for the total stock of disabled, so it depends on the average defined benefit times the stock of beneficiaries

This model shows that relative annual insurance fees in a Chilean-type disability scheme versus a PAYG scheme depends on 1) the size of the expected inflow of newly disabled compared with the stock of total 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 stock of disabled. According to these simulations:²

1. In the short run, a new Chilean-type scheme will require higher insurance fees than a PAYG system because the inflow of new beneficiaries is large relative to the stock of disabled and the average balance in the account is small relative to the price of the annuity that covers a lifetime of benefit payments. It was not adopted in Eastern Europe (which followed the Chilean model for normal retirement) in order to avoid these initial transition costs as well as the difficulties in adjusting assessment rules to private standards (Chlon-Dominczak 2003).

2. But in the long run, Chilean fees are much lower. The funded individual account that is set up for old age retirement finances part of the disability benefit, at no additional marginal cost. In steady state, this will cover about half of the total annuity premium. Additional pre-funding of the annuity at the point of disability produces investment earnings that reduce annual fees to about a quarter of what they would be in a pure PAYG system. The cross-over point comes in the 14th year (Figures 1 and 2).

3. Pre-funding also makes the system less sensitive to demographic shocks. Population aging increases the probability of disability and the cost of disability insurance, whether in a PAYG or pre-funded system. But in a Chilean-type scheme these costs are partially offset by additional money in the accounts of the older workers.

4. However, pre-funding the defined benefit makes the system very sensitive to interest rate shocks. The total cost of the defined benefit annuity and therefore 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 the varying contribution rate (Figure 3).

The evolution of insurance fees vs. benefit payouts in Chile

These simulations imply that insurance fees in Chile would have been relatively high shortly after the new system was introduced in 1982 but would have fallen dramatically over the last 25 years. In contrast, if a new PAYG system had been introduced in 1982 its fees would have been low initially, but would have risen over this period. The cross-over point would be expected to occur in the mid-1990's. In fact, that is roughly what happened.

Figure 4 shows the annual D&S insurance fee (as a percentage of wages), over the period 1990-2004. We compare this with D&S payouts to the stock of beneficiaries (as a percent of wages)--which we use as a proxy for the break-even tax rate that would have covered the same benefits in a PAYG system (see James, Iglesias and Edwards for derivation of this figure). As expected, fees in Chile were higher than PAYG fees would have been near the start of the new disability system, before 1990. But they fell rapidly during the early 1990's, due to growth in account balances in the funded system. At the same time, annual payouts for D&S benefits rose steadily due to the growing stock of disabled beneficiaries —illustrating the inevitable cost path as a PAYG system matures. Thus the insurance fee in Chile is now only 70-75% that of its PAYG equivalent.

However, the recent sharp decline in interest rates is having an offsetting impact, increasing the annuity premium needed to finance the defined benefit, counteracting the further growth in account balances and pushing up the D&S fee over the last few years. Our simulations lead us to expect that this rise in Chilean insurance fees will continue even after interest rates stop falling, because of population aging. But benefit payouts and therefore fees in an equivalent PAYG plan will rise faster and remain higher, for the same reason.

II. Cost Controls by Private Companies in the Chilean Scheme

In most public disability systems a government 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 have been ascribed to public gatekeepers who are generous at the taxpayers' expense, who may 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 from private AFPs to contain costs. AFPs play a major role in the administration of disability benefits, including participating in claim assessments, appeals, monitoring eligibility conditions and determining disability criteria.³ We argue that the incidence of successful disability claims is lower in Chile than it would be in a traditional publicly managed scheme, further cutting costs.

Participation by AFPs in the assessment procedure

Initial claims are evaluated by 21 Regional Medical Boards, each made up of three doctors hired by the public Superintendencia of AFPs (SAFP), but financed by the AFPs. The member may present his/her own medical tests and invite his/her personal

doctor to take part in the discussions (but not the vote). The AFPs and insurance companies also have a non-voting representative--the AFP Association has organized a group of medical observers, who regularly attend Board meetings and monitor its work. About 60% of all claims are approved at the first assessment, for a temporary disability benefit. Three years later the member is re-assessed. AFPs also participate in this second assessment. Currently 80% of the temporarily disabled come up for a second reassessment (most of the attrition is due to deaths and appeals) and 93% of these are accepted as permanently disabled (Association of AFPs 2004).⁴ They receive a lifetime benefit, even if they return to work; hence work by disabled beneficiaries is not penalized, as it is in many countries.⁵

Appeals by AFPs

Traditional public systems usually do not allow agencies to appeal against approved claims; they only allow workers to appeal denials of disability status. And workers who appeal are, in some countries, allowed to be represented by attorneys. As a result, the appeals process invariably raises costs. In Chile, the process is more symmetrical--both AFPs and workers can appeal the decisions of the Regional Boards to a Central Board. In 2004 AFPs appealed 26% of provisionally approved claims and 18% of permanent approved claims, and one-third of these appeals were successful (Association of AFPs 2004). These appeals rates have been growing over time. This reduces the rate of claimants who receive permanent disability benefits by about 8%.

AFP role in shaping criteria for total and partial disability

A Technical Commission meets periodically to determine the medical criteria for granting partial and total disability. Representatives of the AFPs and the insurance companies, as well as three public representatives, sit on this commission, with a vote. For each handicap presented by the member, the rules allot a certain percentage of disability, which are summed to produce the total degree of disability. The Medical Boards may increase this percentage discretionarily according to specified "complementary factors" in the case of older members with a low level of income, or when the member loses the ability to perform his or her normal job. If the degree of disability exceeds 67% the member is considered totally disabled, whether or not he has continued to work, and is granted a 70% defined benefit. If the degree of disability is 50-67% he is partially disabled and gets a 50% defined benefit. If degree of disability is less than 50%, he is not considered disabled. Among the claims that were approved in 2004, 25% were for partial disability. This proportion has been increasing over time.

Eligibility for insurance: avoiding adverse selection

Adverse selection could potentially be a big problem in an economy like Chile's, with a high degree of informality and self-employment. A healthy worker could avoid contributing by working in the informal sector, but move to the formal sector if he develops a complaint and anticipates filing a disability claim. Self-employed individual and independent contractors are not required to contribute to the system but may voluntarily do so if they suspect they are becoming disabled. This is more likely as subjective and chronic diagnoses for disability, such as back pain and mental illness, whose intensity and timing are difficult to establish, replace more objective and acute

diagnoses such as cardiac problems. Such strategic behavior would enable disabled workers to get relatively large benefits for relatively small lifetime contributions, while healthy workers try to stay out of the system, thereby raising insurance fees for the average worker. However, insurance eligibility rules and monitoring by AFPs reduce the likelihood that this will happen. While certification for disability depends purely on medical grounds, eligibility for the defined benefit and the top-up depends on recent work history. In general, an individual must have worked and contributed within the past 12 months in order to be insured. This limits strategic behaviour, especially among workers with acute sources of disability.

Poor record-keeping by public agencies in many countries, including Latin American countries in the past, has made it difficult to enforce insurance eligibility requirements. In contrast, AFPs keep the contribution records of affiliated workers and thus can ensure that they have contributed long and recently enough to be eligible for insurance. In 2004 only 60% of all successful claims were deemed eligible for insurance, a proportion that has been declining (Association of AFPs 2004). Most of the growth in disability probabilities in recent years has occurred among the uninsured—AFPs have little incentive to spend resources on questioning or appealing non-insured claims.

Combating adverse selection by monitoring the reference wage

Another way the Chilean system discourages strategic behavior by workers with irregular contribution histories is by setting a low reference wage for such people. The reference wage used to determine the defined benefit is the simple average of earnings during the prior ten years, expressed in the price-indexed Chilean currency, the UF (Unidad de Fomento), and with a ceiling. Workers who have been in the informal sector, unemployed, or out of the labor force for part of the last ten years will have 0's averaged in and will therefore have a low reference wage and benefit, even if they are insured. This is important because the average density of contributions for an affiliate in Chile is about 60% (Arenas, Behrman and Bravo. 2004; Berstein, Larrain and Pino. 2006). The wage replacement rate for a steady worker who becomes disabled is 70%, but a worker who contributed only 60% of the last ten years would receive only 42% of his working wage (60% of 70%). This low reference wage and benefit makes it less likely that workers with irregular work histories will try to re-enter the system to become eligible for disability insurance, and it saves money for the system if they do get back in. AFPs use their records to ensure that these rules for defining the reference wage are strictly applied, thereby diminishing adverse selection and disability costs.

Results of the claims assessment procedure and eligibility rules

As a result of the first and second assessments, the appeals procedure, and eligibility rules, only 26% of initial claims result in insurance-funded permanent disability benefits. Among those disabled and insured, one quarter are only partially disabled and get a 50% benefit. Many have a reference wage that is far less than their full working wage and therefore a benefit that is far less than 70% (or 50%) of their full working wage. A major role in containing these costs 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.

Disability rates and costs in Chile vs. other countries

We expect these procedures to lead to a low inflow of age-specific newly disabled beneficiaries relative to insured population in Chile compared with other countries and, indeed, this is the case. For example, in 1999, for age group 45-54, 2.9 per thousand members were accepted to new disabled status in Chile, compared with 7.8 per thousand people in that age group in the US and 8.6 in OECD as a whole (OECD 2003 and Table 1). Over all ages, 1 per thousand was accepted to new insured disability status in Chile in 2004, compared with 3 to 5 per thousand in the US over the past two decades (US Social Security Board of Trustees 2005; Social Security Bulletin: Annual Statistical Supplement, various years).

These low incidence rates lead to low insurance fees. The D&S charge in Chile is less than 1% of wages, with 2/3 of this for lifetime disability benefits. D&S insurance fees are .9%-1.7% of wages in other Latin American countries that adopted the Chilean model (AIOS 2005). For comparison, the D&S charge is 1.8% of wages (covering the disabled only until normal retirement age) in the U.S., over 3% in most other OECD countries, and up to 10% in some European countries (US Social Security Advisory Board 2001; Andrews 1999). Of course, many factors besides system incentives enter into these incidence and cost differentials--in particular, the definition of disability, the existence of other programs that cover certain groups of disabled, the generosity and indexation of benefits, and whether they cover the worker until the normal retirement age or death. But it seems likely that pre-funding and participation of private pension funds in the assessment procedure are important parts of the story.

Disability hazard and survival rates in the old and new Chilean systems.

To hold other factors constant, it is most useful to compare disability pension rates in the new and old Chilean systems. Using a recent sample survey of new and old system affiliates (HLSS 2002), we compared the hazard of becoming a newly disabled pensioner for new and old system affiliates aged 40-65. Statistical analysis showed that, out of all individuals who reached a given age without a pension, the proportion who became newly disabled pensioners was 60-70% lower in the new system (Figure 5).⁶ For example, a single man in the old system has a .5% chance of becoming newly disabled at age 54, but in the new system this probability falls to .18%. In the old system, probabilities of becoming newly disabled peaked at 1.5% for a 58-year old single man, but in the new system this man had a hazard rate of only .6%. These data also allowed the calculation of Kaplan-Meier survival functions--the probability of surviving as a disability non-pensioner (rather than becoming a disability pensioner) from the earliest age up to the given age. This survival rate is consistently higher in the new system (Figure 6). Thus evidence on hazards of becoming disabled and costs of disability insurance in the new versus the old system and in Latin American versus OECD systems, all suggest that pre-funding and private participation in the assessment procedure helps keep costs low in the long run.

III. Cost Reduction by Selection and Shifting to the Public Treasury

The measures discussed in Part II reduce costs for the entire system. AFPs, however, also have an incentive to cut their own costs by selecting low risk affiliates, thereby leaving the high risks for other AFPs, and by shifting costs to the public treasury for the disabled with low pensions who will be subject to the minimum pension guarantee. This section presents evidence on these activities.

Differential profitability and selection

Competition in private disability insurance would normally put people into differentiated risk categories, which are charged different prices. When this is limited by asymmetric information or by regulations, differentiated profitability of various workers and cross-subsidies arise. The Chilean requirement of a uniform insurance premium (as % of wages) for all contributors to a given AFP, in the face of differential disability probabilities, is an example of a regulation that makes some types of workers profitable while others are loss-makers. AFPs may then seek out profitable workers and try to avoid serving loss-makers.

The most obvious source of differentiated profitability is by age. Our simulations show that, even though younger workers have smaller accounts and wages, their lower disability probabilities more than offset this effect and reduce their real insurance cost--but not their fee. Having them as affiliates is therefore profitable to an AFP, while the opposite is true for older workers. A second obvious source of differential profitability is gender. On average, age-specific disability rates of men are more than double those of women. Additionally, men have survivors while women usually don't (widows are automatically considered survivors while husbands are not considered survivors unless they are disabled and financially dependent on their wives). The net result is that female workers pay for D&S insurance that they likely never will use, while male workers get more than they pay for. This may discourage women from working in the formal labor market. And conversely, it makes women profitable to AFPs. Chile's new President recently proposed that AFPs should rebate part of this fee to women, because of their low incidence of D&S claims. This represents a move toward differentiated disability insurance rates.

Third, single people cross-subsidize married people, because of the inclusion of survivors' insurance in the group policy. (However, our hazard analysis indicates that married people have a lower disability hazard than single people, which partially offsets the inclusion of survivors' benefits). Finally, large persistent differences appear across regions, despite the procedures described above to unify criteria. In Regions 6 and 8 disability rates are 40-70% higher than in Region Metropolitana (Greater Santiago), despite similar age distributions. The net result is a cross-subsidy to Regions 6 and 8 by the rest of the country, which makes these regions unattractive to AFPs.

We would expect AFPs to attempt to cream the better risks and indeed, we found limited evidence of such attempts. According to our discussions with industry representatives, they use two methods to keep disability costs down: monitoring the assessment procedure (which reduces system costs) and selection (trying to attract and retain workers with low insurance probabilities while avoiding the others). AFPs are not

permitted to exclude workers who wish to affiliate, but they can put forth differential efforts to attract or discourage different kinds of workers. For example, they can and do pay their sales agents different commissions, depending on gender, age and income of the workers they bring into membership. The most aggressive AFPs claim they engage in the following practices: They don't pay any sales commissions on new affiliates from high-risk regions or demographic categories or on those who file for disability benefits within two months of joining; they do pay an above-average commission for new low risk affiliates; they take account of the claims rate in a region when deciding whether to open a branch; consider closing branches in high-risk cities; warn prospective new affiliates that strict criteria will be applied in case of disability claims; have above-average appeals rates; train their staff members to inform workers about other programs such as sickness or accident insurance that cover disability risks; and compete for skilful risk managers who will help them do all of the above.

Selection reduces costs for the given AFP but does not reduce costs for the system as a whole if it does not change total system membership. Since older AFPs already have a stock of members who are likely to stay with them through inertia, the new AFPs are best positioned to use these selection methods effectively. Indeed, we find substantial differentiation among AFPs in successful claims ratios and in behaviors that might influence these rates. In 2004 the ratio of covered accepted claims per thousand contributors varied among AFPs from 1.2 to 1.9, a 50% difference that could translate into a 50% difference in real insurance costs. The AFP that is particularly noted for its selection efforts has been at the bottom end, while the oldest and largest AFP, unable to select, has been near the top end. The former also has the highest rate of successful appeals while the latter has one of the lowest rates (Association of AFPs 2004). Thus cost-cutting by selection seems to go together with cost-cutting by vigorous monitoring of the approval process. Recent reform proposals by Chile's new President include the recommendation of a uniform D&S insurance fee across all AFPs, to eliminate price and profit differences due to selection. Provision of disability insurance would be separated from the management of retirement saving. This proposal would eliminate the problems due to selection—but it might also raise costs by reducing the incentives for AFPs to vigorously counteract adverse selection and carefully monitor the disability assessment procedure.

Shifting costs to the public sector: the minimum pension guarantee

The minimum pension guarantee (MPG) paid by the government sets a floor under disability and old age pensions. The floor is about 25% of the average wage, rising to 27% at age 70 and 29% at 75. Many workers will qualify for the MPG even if they don't qualify for disability insurance because they weren't working at the time of disability. Twenty years of contributions are needed for MPG eligibility among old age pensioners, but only ten years (or even less) are needed among disability pensioners. Low-earners with 10-19 years of contributions (which many have) therefore have a strong incentive to seek disability certification.

Several sub-groups of disabled are likely to have an own-pension that falls below the MPG level: 1) members 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 lives and therefore have a small reference wage and pension; 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% defined benefit; and 5) surviving widows of disabled workers. Each of these categories is due to policy choices that reduce the cost of the private insurance but may increase the cost of the public contingent liability. The MPG serves as a safety valve for a cost-conscious private disability insurance system.

Previous studies have shown that old age retirees with large accumulations tend to annuitize in order to get longevity insurance (protection against the risk of outliving their savings), while those with small accumulations tend to choose programmed withdrawals and rely on the MPG to provide longevity insurance (James, Martinez and Iglesias 2006, Edwards and James 2007). This is true of disabled pensioners as well. As of 2003, 60% of all disabled beneficiaries had taken programmed withdrawal, compared with 35% of normal old age and early retirees—corresponding to the predominance of small pensions among the disabled. The average programmed withdrawal was roughly half the size of the average annuity. Among the 60% who took programmed withdraws, more than half were drawing down their accounts at the minimum pension level. When they use up their own savings, the state will take over, providing they meet the eligibility conditions for the MPG. Another quarter already fell into this category of state-financed pensioners. Indeed, the majority of current MPG recipients are disabled and survivor beneficiaries who started out in programmed withdrawals. If this process continues, it seems likely that an increasing proportion of disabled pensioners, who may be young and live many years after retiring, will eventually receive the MPG. Private disability costs may remain constrained, but public spending will probably rise over time.

IV. What Can Other Countries Learn from Latin America?

The Latin American system for disability insurance has two innovative features: it is pre-funded and it utilizes private pecuniary incentives and procedures to contain successful claims and costs. Pre-funding takes place in two stages: first, building the retirement accounts through the worker's career and second, using an additional payment when the person becomes disabled, to enable the purchase of a lifetime defined benefit. According to our simulations, in the long run the money in the retirement accounts will cover about half of the total disability annuity premium. Further pre-funding through the additional payment initially costs more than an equivalent PAYG system with the same incidence of disability. But it cuts costs dramatically compared with PAYG as the funded system matures. Pre-funding increases the sensitivity of fees to volatile interest rates but it reduces the sensitivity to on-going population aging. Currently the system is in the medium-term, with annual fees lower than they would be in an equivalent break-even PAYG system but with gains slowed down by falling interest rates in recent years.

Finally, the Latin American system of pre-funding enables the assessment procedure to include participation by private AFPs and insurance companies, which have a strong interest in containing costs. Their pressure toward strict application of the rules

and appeals procedures has the effect of reducing the incidence of insured disabled cases. Our calculations of hazard and survival rates, using a retrospective data set of new and old system affiliates (HLSS 2002) show significantly lower hazards of becoming disability pensioners in the new system. This is consistent with lower observed age-specific incidence of disability and disability insurance fees in Chile as compared with publicly managed systems in other countries. Potential dangers here include the incentives for each AFP to try to cream the better risks and to shift costs to the public treasury by expanding the partial and uninsured disability groups, to keep their own costs low.

How can these lessons from Chile be adapted by other countries that have or are considering an individual account system, or those grappling with high disability costs in their traditional systems? We set forth three possible models that capture some of the cost-containment advantages of the Latin American scheme while avoiding some of its problems:

1. *Pre-funding and private insurance with risk-pooling and competitive bidding.* Countries with individual accounts could get the benefits of pre-funding and private participation while reducing the risk of creaming and interest rate sensitivity by placing workers in one large risk pool, as they are in the U.S. and other OECD countries today. In place of the decentralized provision in Chile, the responsibility for the disability term insurance policy could periodically be auctioned off in a competitive bidding process to one company (or a small number of companies to which workers are randomly assigned). The company winning the auction would make the additional payment which, together with the worker's own account balance, would finance the disability defined 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.

However, insurance companies might charge a high risk premium to compensate for interest-rate smoothing if the contract period is long. Moreover, a monopoly insurance provider might have little incentive to monitor claims and eligibility carefully, hoping to cover higher costs by higher fees in the next round of bidding. Each AFP would also have little incentive to control costs, since any savings would be shared among the entire AFP industry as well as the insurance company. In that case, the shift toward a single pool might reduce selection by AFPs but would also reduce oversight and thereby raise costs over-all. 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.

2. *Pre-funding and private insurance, only until normal retirement age.* As a variation on this theme, insurance companies might finance the disability pension only until the normal retirement age (say, age 65 or 67), at which point the old age benefit would take over. This switch at the normal retirement age is roughly consistent with

current practice in the US. 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 and have a specified termination date. 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 PAYG, this variation would imply a smaller shift to pre-funding, therefore lower fees in the short run. However, in the long run fees for the system as a whole would be higher.

3. *Public provision, largely PAYG.* The third option is to use a government agency, rather than private companies, to provide disability benefits. In a country with individual accounts, the agency would take the money in the accounts of disabled workers and pay them the defined benefit. This system would be partially pre-funded by the money in the accounts, but the rest of the benefit would be financed on a PAYG basis. Because of the smaller amount of pre-funding, short run fees would be lower and long run fees higher than in a Chilean-type scheme. Costs would be less sensitive to interest rate variations, but more sensitive to population aging, than in a 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 rules out private provision and cost controls due to private participation in the assessment procedure. Nevertheless, it might be possible to adapt some elements of the Chilean process involving countervailing force, even without the profit motive. 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 an incentive to win their cases. This would increase the probability that both sides would be presented, while leaving the final decision to an impartial court or body of experts. (See similar recommendations by the US Social Security Advisory Board (2001) and Autor and Duggan (2006)).

Countries around the world are faced with rising costs of old age security programs. In many countries, disability expenditures are a high proportion of total social security costs and have been rising even faster than old age expenditures. The experience of Chile suggests that these costs can be contained by prefunding, by private participation in the assessment procedure, and, possibly, by processes that mimic private participation. Although in principle presenting both sides forcefully should improve the accuracy of the evaluation, further research is needed to determine whether this has occurred in reality and whether Chile has chosen the right balance between benefits and costs. In the meantime, countries that already consider their disability costs excessive should seriously consider how these economies and incentives can be incorporated into their systems.

Table 1: Inflow to disability benefit status, Chile vs. US and OECD, 1999
(new inflow, per thousand in insured population)

Age group	20-34	35-44	45-54	55-59	60-64
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

Source: OECD data from OECD (2003), p. 81

Chilean data calculated by authors from claims and assessment data supplied by Association of AFPs, contributor and member data supplied by SAFP. Only disabled who are insured are included here—in 1999 this was about 70% of those who were granted disabled status in Chile. Inflow to temporary disability status is given; inflow to permanent disability status would be about 3/4 as large, depending on age. Ratios are given as % of [(members + contributors)/2] since insured population includes some affiliates who are not currently contributing.

OECD numbers are newly disabled beneficiaries as % of population in the relevant 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.

Figure 1: Simulated Disability Insurance Fee in a Chilean-type Scheme vs. a PAYG Scheme, by System Maturity

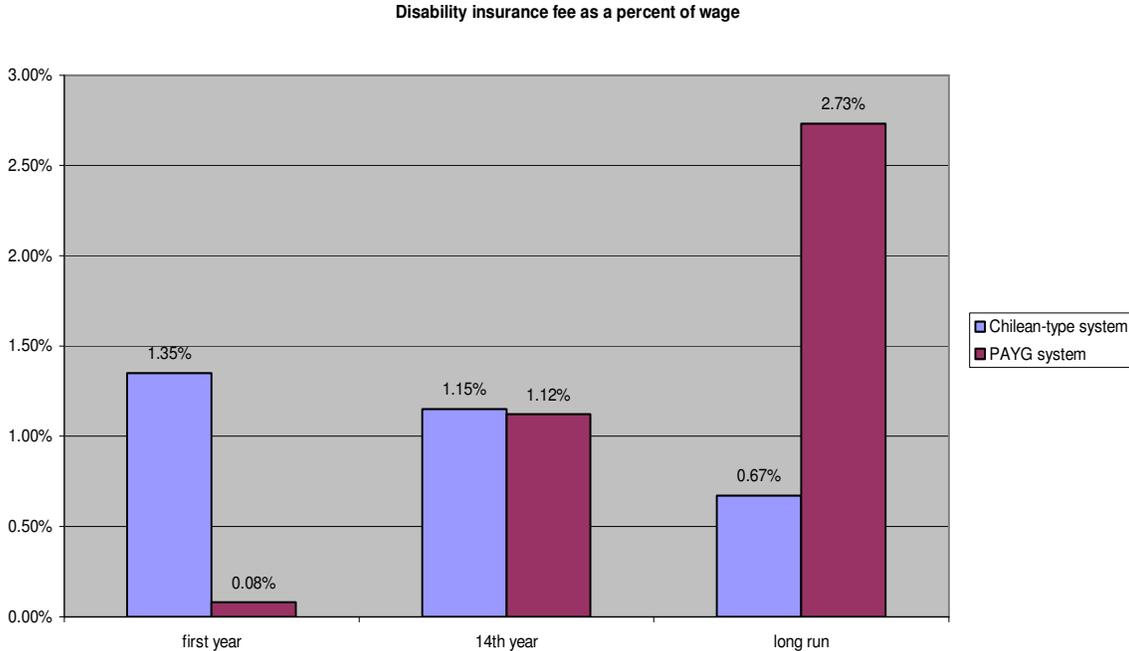


Figure 2: Simulated Percentage of System Annuity Premiums Covered by Retirement Accounts of Newly Disabled, by System Maturity

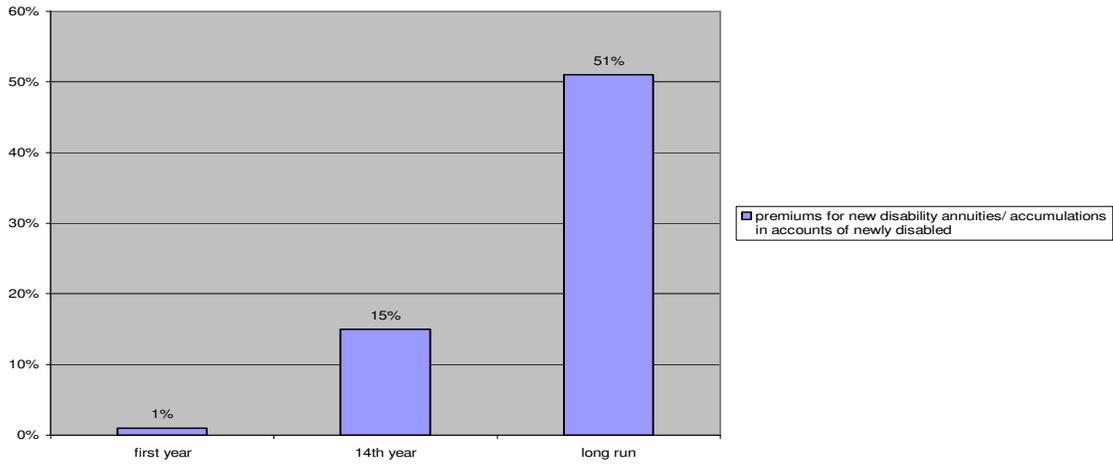


Figure 3: Simulated insurance fee as % of wages in Chilean-type and PAYG Systems: Sensitivity to interest rate changes and population aging

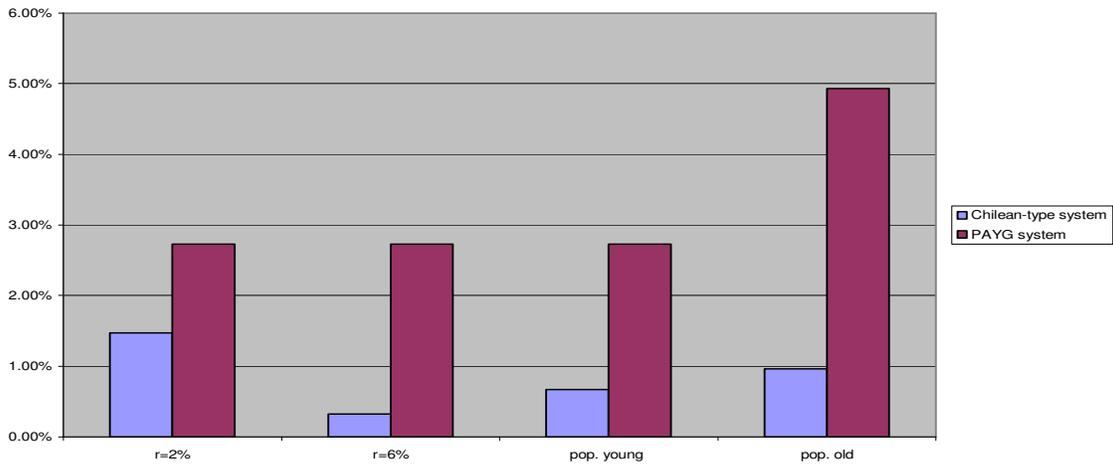


Figure 4: D&S Insurance Fee and Payouts as % of Total Wage Bill, 1990-2004

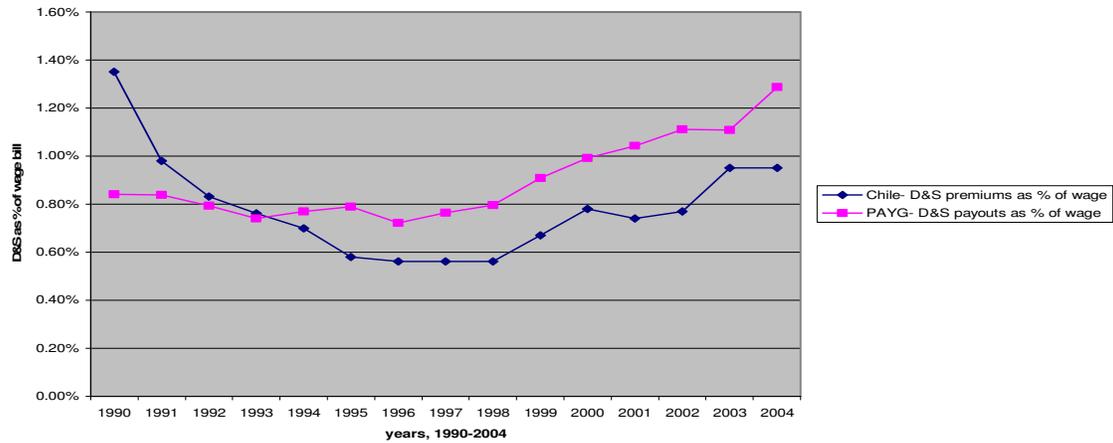


Figure 5: Cox Model—Disability Hazard for Married Men, age 40-65

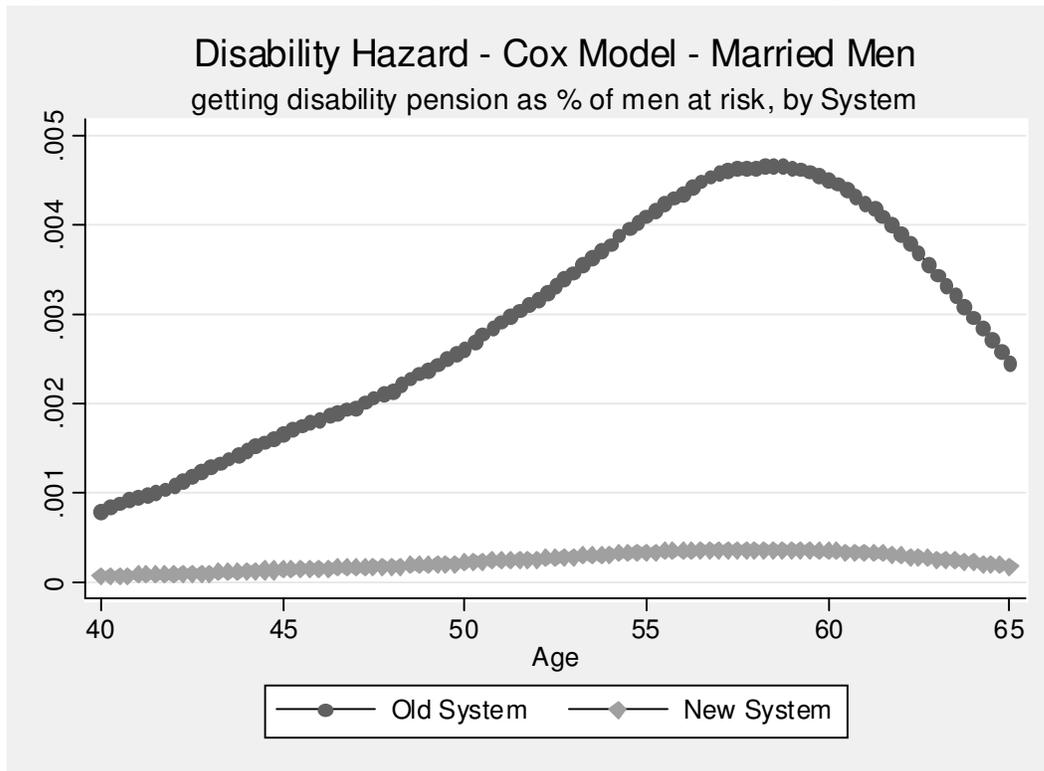
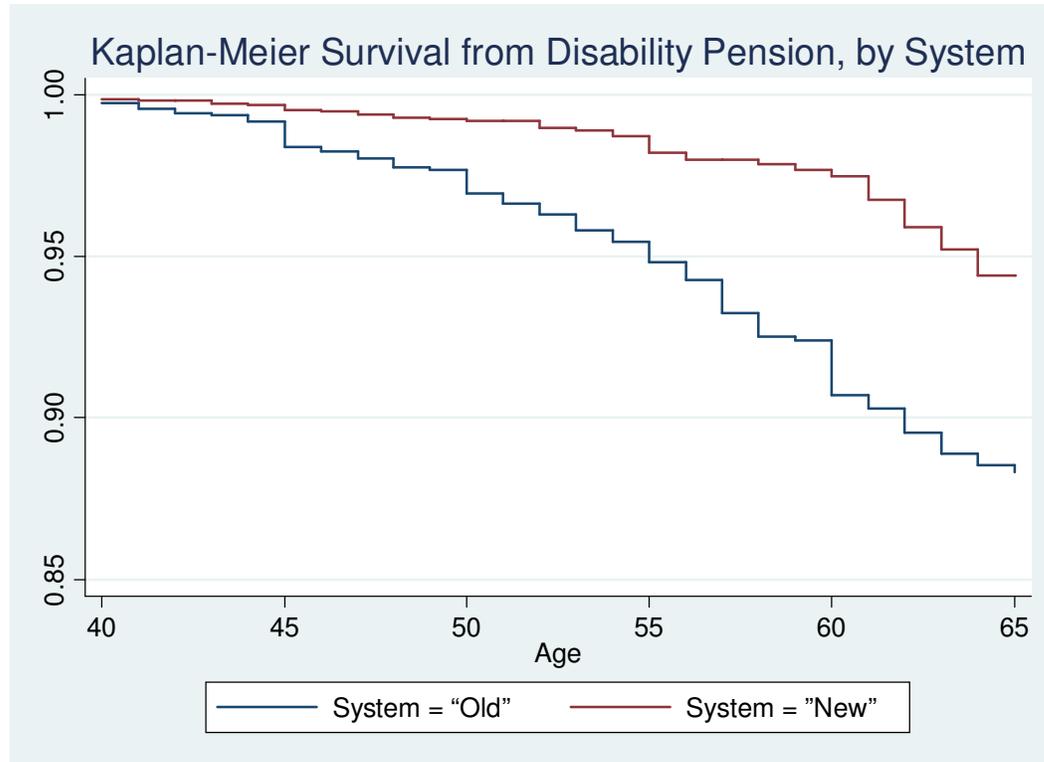


Figure 6: Kaplan-Meier Survival Rate from Disability Pension, Old vs. New System



Bibliography

- AIOS. 2005. Boletín Estadístico AIOS. Número 13. www.aiosfp.org
- Andrews, Emily. 1999. "Disability Insurance: Programs and Practice." Social Protection Discussion Paper. Washington DC: World Bank.
- Arenas de Mesa, Alberto, Jere Behrman and David Bravo. 2004. "Characteristics of and Determinants of the Density of Contributions in a Private Social Security System". MRRC working paper 2004-077.
- Association of AFPs. 2004. Sistema de Calificación de Invalidez: Informe Estadístico. Santiago, Chile.
- Autor, David and Mark Duggan. 2006. "The Growth in the Social Security Disability Rolls: A Fiscal Crisis Unfolding." Journal of Economic Perspectives, 20(3): 71-96
- Berstein, Solange, Guillermo Larrain and Francisco Pino. 2006. "Chilean Pension Reform: Coverage Facts and Policy Alternatives." Journal Economía, 6 (2)
- Castro, Ruben. 2005. "Seguro de invalidez y sobrevivencia: que es y que le está pasando?" Working Paper N°5. Superintendencia de AFP. Santiago, Chile.
- Chlon-Dominczak, Agnieszka. 2003. "Evaluation of Reform Experiences in Eastern Europe". in Pension Reforms: Results and Challenges. Santiago, Chile: FIAP.
- Edwards, Alejandra and Estelle James. 2006. "Pension Reform and Postponed Retirement: Evidence from Chile." Draft
- Grushka, Carlos and Gustavo Demarco. 2003. "Disability Pensions and Social Security Reform Analysis of the Latin American Experience." Social Protection Discussion Paper 0325. Washington DC: World Bank.
- James, Estelle, Guillermo Martínez and Augusto Iglesias. 2006. "The Payout Stage in Chile: Who Annuitizes and Why?" Journal of Pension Economics and Finance, 5(2).
- James, Estelle, Augusto Iglesias and Alejandra Cox Edwards. 2007. "Disability Insurance with Pre-Funding and Private Participation: The Chilean Model," Draft.
- OECD. 2003. Transforming Disability into Ability. Paris: OECD Press.
- U.S. Social Security Advisory Board. 2001. "Charting the Future of Social Security's Disability Programs: The Need for Fundamental Change." Washington DC.
- U.S. Social Security Board of Trustees. 2005. Annual Report. Washington DC.
- Valdes Prieto, Salvador and Eduardo Navarro Beltrán. 1992. "Subsidios Cruzados en el Seguro de Invalidez y Sobrevivencia del Nuevo Sistema Previsional Chileno." Cuadernos de Economía, 29 (88), 409-441.
- Wiese, Patrick. 2006. "Financing Disability Benefits in a System of Individual Accounts: Lessons from International Experience." Draft. Urban Institute.

Endnotes

¹ This paper is based on James, Iglesias and Edwards. 2007. For previous discussions of disability insurance in Chile and other countries with individual accounts see Grushka and Demarco 2003, Castro 2004, Wiese 2005, Valdes and Navarro 1992.

² Base assumptions for these simulation are: 10% of wages contributed to the accounts, 4.5% real net rate of return, 2% real age-earning wage growth, population age structure and age-specific incidence of disability are same as in Chile, defined benefit is 70% of wage, 60% of disabled workers are eligible for insurance, joint annuity with 60% or primary benefit to widow is purchased by men, wives are 3 years younger than husbands. Assumptions are varied for sensitivity analysis.

³ Suppose the AFP starts out with a total fee of 2.4% of the worker's wage, and an actual cost of 2%, half of which is the insurance cost, thereby earning the .4% differential as its profit. If it cuts the insurance cost to .8% and continues charging the same market-determined fee, its profits increase by 50% ($(2\% - 1.8\%) / .4\% = 50\%$). AFPs are therefore highly motivated to keep disability probabilities low, and they are given a role in the evaluation procedure that allows them to pursue this goal.

⁴ This permanency of disability status is quite common in other countries too, either on a formal or de facto basis (OECD 2003). The additional payment to cover the cost of the life annuity is made at the point when the disability is certified as permanent.

⁵ A common problem in disability systems is how to rehabilitate and provide work incentives for disabled workers. This poses a contradiction, because disability benefits are presumably paid to individuals who cannot work, if they work they may become ineligible for benefits and thereby become worse off, yet the economy is better off if they are encouraged and enabled to work.

Chile's system reflects these contradictions. Members who receive provisional pensions may continue working while receiving the pension. If employed they must pay social security contributions. However, if eventually granted permanent total disability status, as most are, the greater balance accumulated in the personal accounts will merely reduce the additional payment without improving the total pension. Thus the entire contribution rate will be a pure tax, reducing the incentive to work during the temporary period. Once the worker gets 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 rewards work, as does the Chilean old age system (see Edwards and James 2006). However, workers who have withdrawn from the labor force during their provisional period may find it difficult to re-enter later on.

⁶ This analysis used the Cox proportional hazard model. The model produced a baseline hazard that applied to single men from the old system and the adjustment (downward) that applied to women, married men and new system affiliates in various age groups between 40 and 65. See James, Iglesias and Edwards. 2007.