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## DISABILITY INSURANCE WITH PREFUNDING AND PRIVATE PARTICIPATION: THE CHILEAN MODEL

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### Introduction

Many countries have adopted old age systems that include individual accounts—funded, privately managed defined contribution plans. Such a system has been under discussion in the US. It is particularly difficult to figure out how 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—granting disability status too generously or too stingily or to

the wrong recipients. The procedure used to evaluate claims can influence this balance and through it the costs and equity of the program. (For a discussion of this point in the US context see Autor and Duggan 2006).

This note describes how Chile, the country that pioneered individual account systems, handles disability insurance, and draws lessons from this experience for other countries. The disability insurance system in Chile is much less well-known than the pension part, but it is equally innovative. It differs from traditional public disability insurance in two important ways:

- 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 and insurance companies, who finance the benefit and have a direct pecuniary interest in controlling costs and reducing adverse selection. Survivors' insurance is handled in the same way, through a combined D&S premium.

Costs of disability and survivors' insurance in Chile are strikingly lower than in countries with pure public systems. The insurance fee is currently less than 1% of wages, with about 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 and running into financial difficulties in the US (covering the disabled only until normal retirement age) and 2-6% in most other

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OECD countries (US Social Security Advisory Board 2001; Andrews 1999).

**Table 1: Inflow to disability benefit status, Chile compared with 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 SAFF. 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

Many factors enter into this cost differential, of course—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—which may be exogenous to the assessment and financing method. To abstract from these variables it is useful to look at the flow of age-specific newly disabled beneficiaries relative to insured population. These ratios, too, are much lower in Chile. For example, in 1999, for age group 45-54, 2.9 per thousand insured 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).<sup>1</sup> Over all ages, 1 per thousand was accepted to new insured disability status in Chile in 2004, compared with 4 to 6 per thousand in the US over the past two decades (US Social Security Board of Trustees 2005).

Part I of this note describes the Chilean procedures in greater details and argues that incentives stemming from the participation of private pension funds and insurance companies help account for these cost and incidence differentials. By contrast, our simulations in Part II show that pre-funding has a more ambiguous impact compared with PAYG, raising disability fees in the early years of a new system as funds are built up but reducing them in the long run as benefits are covered out of accumulated funds. Pre-funding makes costs less sensitive to population aging but more sensitive to inter-

est rate volatility. We also find evidence of selection, creaming and cost-shifting to the public sector through its minimum pension guarantee. The Conclusion considers how features of the Chilean model could be adapted by other countries, whether or not they have individual accounts.

## The Role of Private Companies in Assessing Disability and Financing Benefits

### How Disability Insurance Works in Chile

Disability insurance in Chile starts with the mandatory retirement accounts, to which each individual must contribute 10% of wages. If a worker becomes disabled before retiring, the retirement savings account covers part of his disability pension, but he receives a pre-specified defined benefit regardless of the amount he has accumulated. This is accomplished through the private insurance market, with government providing detailed regulations and back-up guarantees.

Specifically: Each insured worker is guaranteed a lifetime benefit that is 70% of his average wage if he is totally disabled, 50% if he is partially disabled, indexed to inflation. At the workers' choice, this benefit takes the form of a lifetime annuity or a gradual withdrawal. The worker purchases this benefit with the money in his account, but if this is insufficient the account is topped up to the level that will cover the specified annuity. Each pension fund (AFP) is required to purchase a term group insurance policy that will cover the cost of this top-up 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 (hence has an incentive to keep costs low), while the insurance company takes over after the maximum rate has been reached (thereby covering extreme outcomes). Survivors' insurance for workers is covered in the same way, by the same insurance policy.

The insurance fee is included in the general administrative charge that each worker pays the AFP. Apart from a small flat component, the total administrative charge is a uniform percentage of wages for each AFP—currently averaging around 2.4%—regardless of age, gender, occupation or account size. The combined cost of the group disability plus survivors' (D&S) insurance is slightly less

than 1% of wages, with the disability portion about 2/3 of this total. Figure 1 gives the historical evolution of the D&S insurance fee and compares it with the annual payouts for pensions received by the stock of insured beneficiaries. Later, we use this to compare annual cash flow costs under a pre-funded and PAYG system.

### Incentives Facing Pension Funds to Keep Costs Low

For any given total fee that the AFP charges, lower disability costs mean that more is left over for the AFP owners. 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 fee (because demand is viewed as inelastic) 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 assessment procedure that allows them to pursue this goal. Their presence in this procedure ensures that any doubts about the claim are raised, just as the adversarial process in a trial is intended to ensure that both sides are presented.

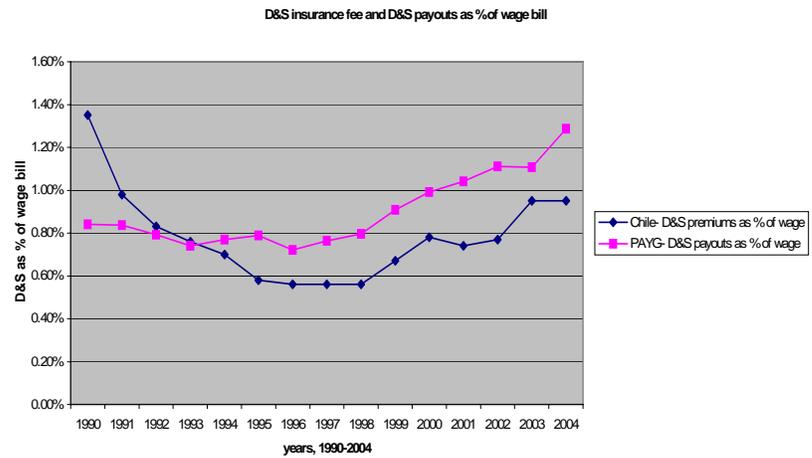
This contrasts with the process in most public systems, in which the evaluation of the disability is made by a public agency or a body of medical experts, none of whom has a direct financial incentive to limit successful claims. Stories abound of countries with high disability costs because public gatekeepers are generous at the taxpayers' expense, or accept bribes in return for applying lax standards, or allow governments to use disability benefits as a substitute for unemployment insurance or early retirement. The Chilean system attempts to balance public gatekeepers with a countervailing cost-containing force from private AFPs.

### 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 at-

tend Board meetings and monitor its work. About 60% of all claims are approved at the first assessment, for a

**Figure 1: D&S insurance fee and payouts as % of total wage\***



\*see James and Iglesias (2006) for derivation of numbers

temporary disability benefit. Three years later (or sooner, if the individual reaches the normal retirement age), the member is re-assessed. Currently 80% of the original group comes up for a second reassessment (most of the attrition is due to deaths) and 93% of these are accepted as permanently disabled (Association of AFPs 2004). They receive a lifetime benefit, even if they return to work (hence work by disabled beneficiaries is not penalized). 2

### Appeals by AFPs

A Central Medical Board hears appeals from both sides and tries to keep uniformity across regions. The Central Medical Board is also made up of three physicians appointed and paid by the SAFP but financed by the AFPs. Some AFPs hire their own doctors to try to build strong appeals. In 2004 26% of temporary approved claims and 18% of permanent approved claims were appealed by AFPs, rates that have been growing over time, and one-third of these appeals were successful (Association of AFPs 2004). This reduces the rate of permanent beneficiaries by 10-15%. Traditional public systems usually do not allow agencies to appeal against approved claims, so costs would be commensurately higher, *ceteris paribus*. 3

### 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, a proportion that 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. This would raise insurance fees for everyone. Insurance eligibility rules and monitoring by AFPs reduce the probability that this will happen. While certification for disability depends purely on medical grounds, eligibility for the defined benefit depends on recent work history. In general, an individual must have worked and contributed within the past 12 months in order to be insured. 4 This limits strategic behavior for worker with acute sources of disability, although it is still possible for those with chronic conditions. AFPs also actively discourage sales agents from bringing them new affiliates who are likely to apply for disability benefits in the near future, by refusing to pay sales commissions in these cases.

Poor record-keeping by public agencies in many Latin American countries has made it difficult to enforce eligibility requirements in the past. In contrast, AFPs keep the contribution records of their affiliates and thus are strategically placed to ensure that the eligibility conditions are observed. In 2004 only 60% of all successful claims were deemed eligible for insurance, a proportion that has been declining (Association of AFPs 2004). While the probability of becoming certified as disabled has risen in recent years,

most of this growth has occurred among the uninsured—AFPs have little incentive to spend resources on questioning or appealing claims that will not, in any event, cost them money. Permanently disabled workers who do not meet the insurance eligibility conditions can withdraw their own money as an annuity or programmed withdrawal, but do not get the additional payment that would cover a 70% replacement rate.

### Monitoring the Reference Wage

Workers with chronic conditions could still attempt to get a covered job shortly before applying for disability benefits, thereby charging the system far more than they have contributed. Even if they don’t behave strategically, the normal movement of workers in and out of the (non-contributing) informal sector and self-employment could pose a similar financial problem, raising fees for everyone else. This problem is avoided by setting the reference wage low 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 have 0’s averaged in and therefore have a low reference wage and benefit, even if they are insured.

In Chile, the density of contributions—that is, the portion of his working life that an average worker contributes—is about 60% (Berstein, Larrain and Pino 2005; Arenas, Behrman and Bravo 2004). If disabled, a steady worker gets a 70% replacement rate but a worker with an average density of contributions gets a benefit that is only  $60\% * 70\% = 42\%$  of the wage he got when working. Widows of these average disabled beneficiaries get 60% of his reference benefit, in other words  $60\% * 60\% * 70\% = 25\%$  of the wage he got when working. AFPs use their records to ensure that these rules for defining the reference wage are strictly applied, in contrast to other countries, where implementation may be lax.

Thus, less than 20% of all initial claims are projected to ultimately be deemed totally permanently disabled and insured (plus another 7% for partial disability), based on these 2004 parameters from the first and second assessment, the appeals procedure, eligibility evaluations and division into partial vs. full disability ( $60\% * 80\% * 93\%$

\*90%\*60%\*75%), a proportion that is quite low by international standards. (In the US, for example, acceptance rates are more than double). And many of these individuals get a defined benefit that is only 30-45% of their wage when working. 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.

### Shifting the Costs to the Public Sector: the Minimum Pension Guarantee

Underpinning all these private insurance arrangements is a public minimum pension guarantee (MPG), which sets a floor on disability income for workers who meet the MPG eligibility condition even if they don't qualify for disability insurance. Workers with ten years of contributions or sometimes even less qualify for the MPG, if disabled. 5 This contrasts with 20 years of contributions required for MPG eligibility for non-disabled workers. Low earners with 10-19 years of contributions (which many have) will not qualify for the MPG normally, but will qualify if they are certified as disabled—and therefore have an incentive to be certified.

Eligibility conditions for the MPG are also easier than eligibility for disability insurance, since many workers who contributed in the past but not the present will qualify for the former but not the latter.

Once they meet the eligibility criteria, 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 with low density of contributions who have a small reference wage and pension because many 0 years have been averaged in; 3) insured individuals who choose programmed withdrawals and live longer than the out-dated mortality tables would predict; 4) partially disabled workers who get only a 50% defined benefit; and 5) surviving widows of disabled workers (originally entitled to the MPG at the 60% level but this has been implemented at the 100% level). Note that 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.

With regard to the first group: The private pecuniary incentives that limit the success rate of claims of insured workers may not operate to limit successful claims of non-insured workers. AFP representatives know whether a worker has been contributing at the time of his

**Table 2: Percentage of programmed withdrawal pensioners at MPG**

	% on MPG from govt (1)	% increasing PW to MPG floor (2)	Following PW formula or voluntary reduction (3)	% at MPG level (1+2)	Total number (5)	Number on MPG from govt. (6)
<b>Total disability</b>	25%	53%	22%	78%	13,719	3,412
<b>Partial disability</b>	19%	64%	17%	83%	2,800	532
<b>Survivors</b>	19%	53%	28%	72%	65,551	12,517
<b>All PW pensioners</b>	15%	55%	30%	70%	173,278	25,528

Source: data provided by Superintendencia de AFP (SAFP) and calculations by authors. This table shows the proportion number of pensioners who already receive the full MPG from the government (col. 1); those who are still drawing down their own accumulations but at an accelerated rate in order to stay above the MPG floor (col. 2); and those who are following the PW formula above the MPG level or have voluntarily reduced their payouts, perhaps for tax reasons, while remaining above the MPG (col. 3). Survivors include 1) survivors of D&S insurance (that is, widows and dependent children of workers and disabled beneficiaries) and 2) recipients of joint annuities purchased by retired workers. More than half are from D&S insurance. This table applies only to programmed withdrawal pensioners. About 60% of all disabled beneficiaries are on PW. Annuitants are much less likely to be at the MPG level.

claim and is therefore likely to be insured. They have no reason to spend resources on questioning or appealing non-insured claims. The Medical Boards may have less desire to deny a claim of non-insured workers who, it appears, will simply be getting early access to their own savings. These factors may be contributing to the rising proportion of non-insured disabled, many of whom will become candidates for the MPG because they don't get the 70% replacement rate. Points #2-5 are additional reasons why, even if they get the defined benefit, it may be small.

Previous studies have shown that old age retirees with large accumulations tend to annuitize in order to get longevity insurance, while those with small accumulations tend to choose programmed withdrawals and rely on the MPG to provide longevity insurance (James, Martinez and Iglesias 2006). This is true of disabled pensioners as

well. As of 2003, 60% of all disabled beneficiaries had taken programmed withdrawal, compared with 35% of old age plus early retirees—corresponding to the larger proportion with small pensions among the disabled. The average size programmed withdrawal was slightly more than half the average annuity. More than half of disabled programmed withdrawal pensioners were drawing down their accounts at the minimum pension level. When they use up their own funds the state will take over, providing they meet the eligibility conditions for the MPG. Another quarter had already exhausted their accounts and were receiving their pensions from the state. Indeed, the majority of current MPG recipients are disabled and survivor beneficiaries (Table 2).

The minimum pension is about 25% of the average wage, rising to 27% at age 70 and 29% at 75. Although formally not indexed to wages, it has been rising through time with wages (at about 2% real annually), due to ad hoc political decisions. When it rises, the increase applies to the stock of existing retirees, as well as the new flow (James, Martinez and Iglesias 2006). This increase in MPG can add up to a particularly large amount for 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.

## Pre-funding v. PAYG

### Simulation Results

We carried out simulations to compare the costs of a pre-funded Chilean-type scheme with that in a hypothetical PAYG system that pays the same benefits to the same number of beneficiaries—i.e., the cost of financing the additional payment that will cover a lifetime annuity for the inflow of newly disabled in Chile, versus the cost of financing on-going annual benefits for the entire stock of disabled workers under PAYG. (In base case rate of return = 4.5%, rate of wage growth = 2% and Chilean incidence rates and demographic structure are used. In sensitivity analysis, these assumptions are varied. For details see James and Iglesias 2007). In this part of the analysis we abstract from the incentive effects of private participation discussed in Part I. Our simulations show that:

1. In the short run, a new Chilean-type scheme requires greater outlays than a PAYG system, because it is building up reserves for a lifetime of payouts. 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). But in long run steady state annual Chilean costs 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. Figure 1 shows an intermediate situation in which the annual insurance fee in Chile is 60-80% of the payouts to current beneficiaries—the latter used as an indicator of the required fee if the same benefits were provided on a PAYG basis.

2. 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. Insurance fees increase, but not as much as they would under PAYG.

3. However, pre-funding the defined benefit makes the 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 have to adjust to the varying contribution rate. According to our simulations, a 2.5% decrease in interest rates (from 4.5% to 2%) will roughly double the premium needed to cover permanent disability costs (from .67% to 1.47% of wages), if it continues in the long run. <sup>6</sup> This interest rate sensitivity is much higher than that normally associated with annuities because of a leverage factor—if the necessary capital for the defined benefit rises without a corresponding increase in account balance, the additional payment from the insurance company bears the full brunt of the increase needed. In reality, the balance in the worker's account will increase in the short run, due to rising bond prices as the interest rate falls, and this covers part of the higher necessary capital. But in long run steady state, the additional payment must rise even more, since worker's own-

accumulations will be smaller due to the lower rate of return. 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.

### Cross-subsidization and Selection

Pricing the D&S insurance fee as a uniform % of wage for all members of an AFP leads to cross-subsidies among workers with different risk characteristics. In particular, young single workers, women, workers with flat age-earnings profiles and workers in regions with low claims rates cross-subsidize others (Figure 2). This may lead these workers to avoid contributing, by working in the informal sector—one possible reason why the density of contributions has not increased much under the new system. 7

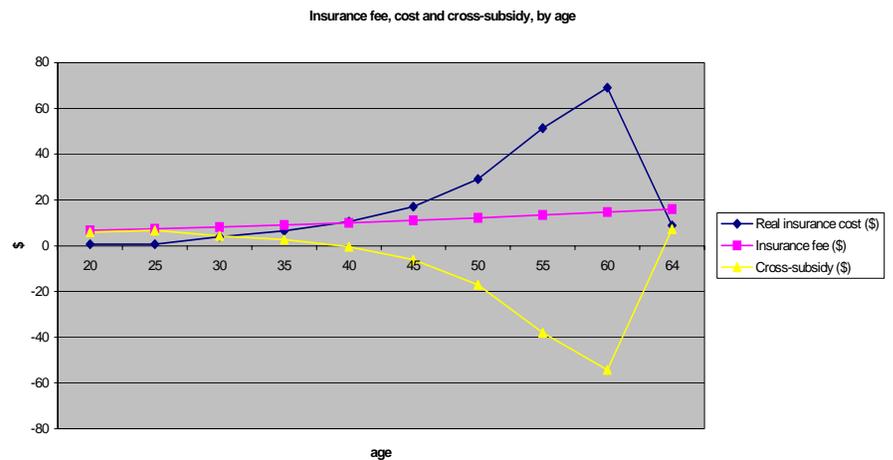
In a competitive market, this may also lead AFPs to attempt to cream better risks. Indeed, we found limited evidence of such attempts. AFPs are not permitted to exclude workers who wish to affiliate, but they can put forth differential efforts to attract or discourage different kinds of workers. The most aggressive AFPs 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 sales commission for new low risk affiliates; they take account of the claims rate in a region when deciding whether to open a branch; warn prospective new affiliates that strict criteria will be applied in case of disability claims; have above-average appeals rates and compete for skilful risk managers who will help them do all of the above (based on authors' interviews with AFP executives). If some AFPs follow these strategies more effectively than others, high-risk workers may end up with less choice, pooled with other high-risk workers for their retirement accounts, in AFPs with high fees or low service.

In 2004 the ratio of insured 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 these selection efforts has been at the bottom in terms of insured covered claims per contributor, while

the oldest and largest AFP, unable to select because it already has many members, 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

**Figure 2: Difference between real insurance cost vs. insurance fee, by age**



the recommendation of a uniform D&S insurance fee across all AFPs, to eliminate price differences due to selection. This could be accomplished by giving a single insurance company, chosen in a competitive bidding process, the responsibility for providing the additional payment for everyone. Workers would then all be placed in one large risk pool, rather than being divided into 6 separate risk pools, as they are today. Provision of disability insurance would be separated from the management of retirement saving. However, a monopoly insurance provider might believe it could pass higher costs back to the worker in the next round of bidding, so it would have less incentive to monitor claims and eligibility carefully. Each AFP would also have less 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 reduction in positive selection by AFPs would be accompanied by higher costs due to a reduction in oversight.

## What Can the US and Other Countries Learn from Chile?

The Chilean 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 in Chile 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. We estimate that in the long run, the money in the retirement accounts will cover about half of total disability costs. Further pre-funding through the additional payment costs more than a PAYG system initially, but it cuts costs dramatically as the funded system matures. Pre-funding reduces the sensitivity of costs to population aging but increases its sensitivity to interest rate changes. Finally, it enables the financing and assessment procedure to include participation by private AFPs and insurance companies, which have a strong interest in containing costs.

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

1. *Pre-funding and private insurance with risk-pooling and competitive bidding.* In countries with individual accounts, private insurance companies could be used to augment the balance in the account and pre-fund a lifetime disability defined benefit, as in Chile today. However, to avoid the selection and creaming problems discussed above, workers could be placed 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 have the responsibility to make the additional payment which, together with the worker's own account balance, would finance the disability defined benefit. Both the social security system and the insurance company would participate in the assessment process. In the long run, annual fees would be kept low by investment returns on the funds, private monitoring of the assessment process, and scale econo-

mies/bargaining power stemming from the competitive bidding process. However, in the short run, the transition to pre-funding would raise fees. Additionally, insurance companies might charge a high risk premium because of their limited control over the evaluation procedure and the long uncertain time period for the lifetime annuity. Moreover, if the defined benefit for disability were high relative to the reformed old age benefit, workers would be encouraged to seek disabled status, also raising costs.

2. *Partial pre-funding with private provision, only until normal retirement age.* A variation on this theme would have insurance companies finance the disability pension only until the normal retirement age (say, age 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 67. At that point, the disability annuity would cease and he would be treated similarly to normal retirement pensioners. This variation would imply partial pre-funding but less than the previous option (therefore lower transition costs but also lower long run cost savings), less uncertainty for the insurance company since the annuity is for a fixed term rather than a lifetime, and a smaller incentive for older workers to apply for disability benefits—the latter two reducing costs. It would continue to include some private participation in the assessment process and the incentives for cost containment that this implies.

3. *Public provision, largely PAYG.* The third option would 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 and pay the defined benefit directly to disabled individuals. 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. In a traditional system with no accounts, finance would be completely PAYG. Because of the smaller amount of pre-funding, 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 in a funded scheme. Cost controls due to private participation in the assessment procedure would be absent in this arrangement. Among countries with individual account systems, this method is used in Hungary, Croatia and de facto, in Mexico—to avoid transition costs. A variation in Latvia, Estonia and

Sweden pays the disability benefit only until normal retirement age, at which point the individual is treated similar to normal retirement pensioners—to further reduce up-front costs and moral hazard.

The reliance on PAYG 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, with cost-containment and accuracy as the objectives. 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. (See similar recommendations by the US Social Security Advisory Board (2001) and Autor and Duggan (2006)).

This note has focused on the impact of private incentives and pre-funding on disability insurance costs in the Chilean scheme. The Chilean system is expected to exert a downward pressure on costs and, indeed, disability claims and costs seem to be relatively low compared with other countries. Further research is needed to determine whether more accurate evaluations are made by this procedure and whether Chile has chosen the right trade-off between benefits and costs.

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*This note is based on James and Iglesias 2007, where these issues are developed further. Also see Grushka and Demarco 2003, Valdes and Navarro 1992, Castro 2004.*

#### Endnotes

1 We approximate the insured population in Chile as consisting of an average of contributors and affiliates, since all contributors plus some non-contributing affiliates are insured. The OECD numbers use all individuals in the age group as the denominator. If this term were used for Chile its disability rate would be much lower than that given above, because of the wide disparity between number of residents and insured persons.

2 In contrast, in the US medical evidence provided by the claimant are given the greatest weight. But those who return to work lose their benefits. (Few return to work).

3 For example, in the U.S., appeals can only be brought by workers whose initial claims have been denied, so appeals inevitably increase approved cases. In 2000, only 38% of claims were approved initially, but more than half of those denied benefits appealed. Therefore, 55% of all claims were eventually accepted. (Social Security Advisory Board 2001, pp. 8, 18, 19; Autor and Duggan 2006). It is possible that the expectation of one-sided reversals leads to more negative initial decisions. Data are not available on how many appeals against denials were made by worker-claimants in Chile.

4 The individual must 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 6 contributions in the year immediately preceding the last registered contribution. 3) Self-employed workers must have paid at least one

contribution in the calendar month before the date of the claim. 4) In addition, he must not be a pensioner or be over the normal retirement age (65M/60W). These conditions are lighter than those in other countries with contributory schemes. For example, 3 years of contributions are typically required in Latin America, 5 years in OECD countries (OECD 2003, Grushka and Demarco 2003, Andrews 1999). In the US the applicant must have worked in 5 of the last 10 years and cannot be working currently.

5 The worker must have: 1) at least 10 years' contributions in the social security system, or 2) at least two years' contributions in the last 5 years prior to the disability claim, or 3) 16 months contributions if he has joined the labor force within the last 2 years, or 4) been contributing at the date of disability, if this was caused by an accident. If the individual has other sources of incomes, such as wages or pension from the old system, this may invalidate his eligibility for the MPG. See James, Martínez and Iglesias 2006.

6 An offsetting factor, not included in these calculations, is the cost of temporary disability, which is not pre-funded and therefore is much less interest-rate sensitive.

7 Proposals recently set forth by Chile's new President recommended that AFPs rebate part of this fee to women, because of their low incidence of D&S claims. Also recommended was a uniform D&S insurance fee across all AFPs, to eliminate price differences due to selection. However, this might also diminish the AFPs' incentives to control costs, since any savings would be shared among the entire AFP industry.

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