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Extending Coverage in Multi-Pillar Pension Systems: Constraints and Hypotheses, Preliminary Evidence and Future Research Agenda

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**Extending Coverage in Multi-Pillar Pension Systems:
Constraints and Hypotheses, Preliminary Evidence and Future Research Agenda**

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Abstract

The paper provides a set of preliminary hypotheses and exploratory econometric testing to explain low rates of participation in reformed social security systems, with special emphasis on two Latin American countries. The hypotheses claim that the working poor and self-employed continue to have a specific and strong rationale for avoiding participation in the multi-pillar pension system and that transactions costs, system design issues, and problems of credibility negatively influence the decision of all members of the labor force to participate. Some of the established hypotheses have been subjected to exploratory econometric testing using available household survey data for Chile and Argentina. The results support the conjecture that socioeconomic characteristics matter for (non) participation, and that the poor, the uneducated and the self-employed pose a special challenge to the extension of pensions coverage. The paper outlines a research strategy, including a more social security-focussed survey and comparative analyses, to confirm the results presented in this paper, and to test those hypotheses related to the different pensions institutions reforming governments have chosen to put in place. Work in this vein has already begun.

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I. Introduction and Overview¹

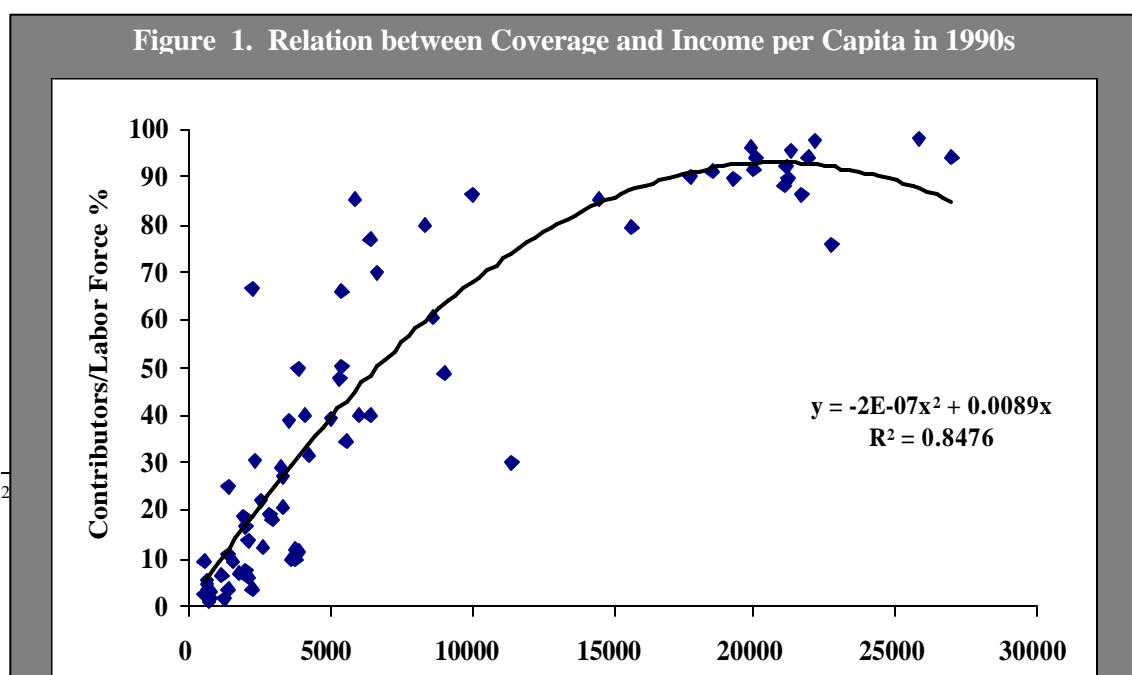
Of the world's 6 billion people in 1999, only 15 percent or less have access to a formal system of retirement income support. To the extent that households can rely on traditional arrangements and alternative investments in retirement security, there may be little cause for worry. However, with the aging of populations, urbanization and globalization, the elderly will have reduced access to informal, traditional safety nets in the family or community. Economic development may not be fast and comprehensive enough for individuals to accumulate sufficient real and financial assets over their working lives, rendering them increasingly vulnerable to the risk of poverty in old age. This danger ties the concern with low rates of coverage closely to the World Bank's mission of eradicating poverty. For this reason the Bank has proposed a multi-pillar pension system to provide adequate pensions for the working population and to cushion against economic, demographic and political risks to income support in retirement. Many countries in the world have started or are contemplating a move toward a multi-pillar pension system, but evidence so far suggest that such a move has done little to increase coverage of the workforce and perhaps may have even contributed to a decline in coverage in some countries.

The alternatives to a contributory, mandated scheme of old-age income support are non-contributory schemes in the form of demogrants, social pensions, and universal or specially targeted social assistance. While universal and non-means tested benefits are effective in addressing old-age poverty, they are often expensive and inefficient. Means-tested benefits are potentially efficient but difficult to administer to be effective. Working through community support and non-government organizations presents a potential alternative to reach the elderly poor, but there is little evidence of the effectiveness and long-term sustainability of relying on organized civil society. The viability of non-contributory systems of income support for the elderly poor in an environment of scarce public resources and low administrative capacity is being examined in a different project.²

The limited coverage of contributory, multi-pillar pension systems and the difficulties of providing effective and efficient income support for the elderly through non-contributory schemes calls for an investigation of the relative merits and economic trade-offs of each. The investigation requires a better understanding of the constraints to

¹ The paper has profited from many useful comments and suggestions during its preparation and the discussion at the research conference. Special thanks go to Indermit Gill, Anita Schwarz, Charles Griffin, Estelle James, Louise Fox, Juan Yermo, P.S. Srinivas, Miguel Navarro, Olivia Mitchell, Rafael Rofman, Salvador Vales-Prieto, John Hoddinott and Abigail Barr for their insights and comments. All errors are, of course, the responsibility of the authors.

broader coverage under a multi-pillar scheme. Such a scheme ideally consists of (i) a publicly managed, unfunded, and defined benefit pillar, which is tax or contribution financed and should take care of poverty and redistributive concerns; (ii) a privately managed, fully funded, and defined contribution pillar, which takes care of income replacement and is financed by earnings-related contributions – both (i) and (ii) are mandatory – and (iii) voluntary saving for old-age in the form of assets, insurance contracts, housing, etc. However, since pension reforms mostly start from the existing systems and are constrained by national preferences, the economic environment, and the costs of transition, the resulting pillars are of varying size and structure (Holzmann 1999; Schwarz 1999). Yet, even an ideal multi-pillar structure may not be able to attract all individuals in the labor force. International evidence hints to a strong correlation between the level of coverage under a formal pension system and the income level of an economy (see **Figure 1**). This correlation suggests that administrative and other efforts to achieve complete coverage may come at a price for individuals and the economy.



The objective of this paper is to discuss the governmental, institutional and market-oriented failures that deter rational individuals and households from participating in reformed multi-pillar pension systems. To this end, the structure of the paper is as follows: Section II outlines briefly why coverage extension may be beneficial beyond providing old-age income support, identifies the main barriers, and highlights drawbacks of aggressively expanding coverage in contributory pension systems. Section III reviews the coverage experience in reformed schemes, with illustrative focus on Chile (which has the longest experience with a funded pillar of individual accounts since its reform in 1981) and Argentina (whose adoption of a “mixed” model in 1994 presents its own set of implications for coverage). In Section IV the main hypotheses on the barriers to coverage and obstacles to extending access to the multi-pillar pension system are organized in five groups: (i) the case of the poor, (ii) the case of the self-employed, (iii) transactions costs, (iv) system design issues, and (v) system credibility. Section V presents very preliminary econometric evidence on some of the hypotheses based on existing data from Chile and Argentina, while Section VI outlines ongoing and future research projects and efforts to collect the necessary data to test all the hypotheses. Section VII concludes.

II. The Broader Benefits, Barriers and Drawbacks to Extending Coverage

The benefits and barriers to increased coverage extend beyond the pension system and income security in old age. The benefits are largely attributed to the expected formalization of the work relationship in a world of increasing risk and waning reliance on strained traditional systems of social security, brought on by aging, urbanization and globalization. Barriers to greater coverage are presented by a wide range of failures by government and market institutions. For this reason an improvement in the benefit-contribution link alone will have only a marginal impact on coverage, if any, and as a result increased coverage may come at a cost. The arguments in favor of increasing coverage as well as some of the principal drawbacks are addressed below.

The main benefits from increased coverage under a multi-pillar pension scheme arise in the following ways:

- ❖ Formalized work relations promote better labor conditions, enforceable labor rights and access to formal social risk management instruments besides pensions, such as health, accident, sickness or unemployment protection (Holzmann and Jorgensen 1999).

for old-age, World Bank project, under preparation.

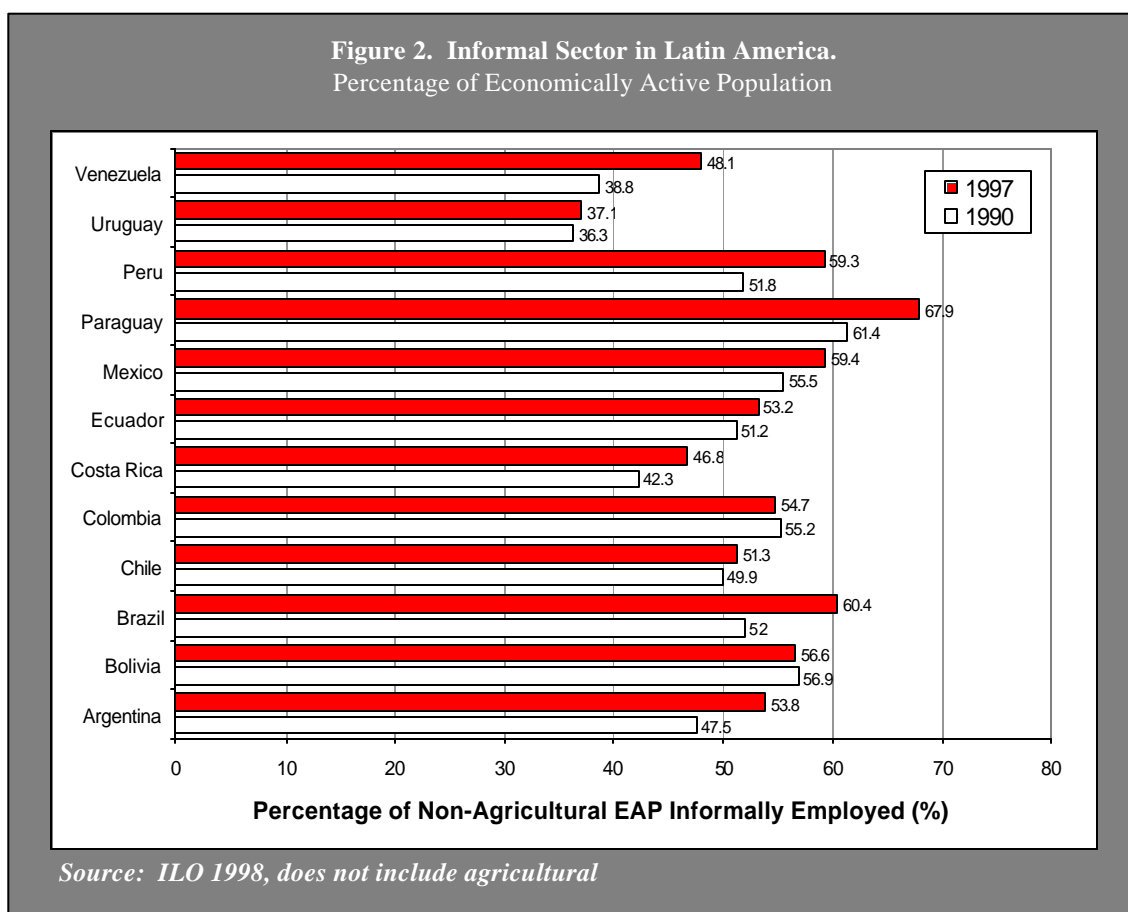
- ❖ Moving from the informal to the formal sector may effect economic growth. If the informal sector uses less productive technology with higher transaction costs, labor force movement to the formal sector will enhance overall productivity and, in an endogenous growth model, can lead to a higher growth path (Corsetti and Schmidt-Hebbel 1994).
- ❖ Expanded coverage and formal labor force participation will further strengthen the overall revenue position of the government, which in turn may allow for additional growth-supporting and poverty-reducing expenditures.
- ❖ Partial pre-saving under a multi-pillar scheme should also better secure the provision of future benefits. Reliance on the multi-pillar allows households to diversify income risk through foreign investments of pension fund resources.
- ❖ Expanded coverage under a multi-pillar scheme strengthens the secondary effects of the move from an unfunded PAYGO to a system of funded pillars, including a contribution to national savings and financial market development.
- ❖ Additional secondary benefits presented in the literature include: an institutional shift toward less reciprocal market arrangements that broadens household choice (Barr 1998); greater productivity from lifting institutional constraints that confine households to unproductive liquid investments (Alderman and Paxson 1992); and economic growth from increasing access to savings and the efficiency of investment through greater participation in the formal capital market (Serrano 1999).

The main barriers to increasing coverage are linked with market imperfections and the regime switch that a move from the informal to the formal sector implies. Design improvements in the multi-pillar over the single-pillar PAYGO systems may have some, but perhaps only limited effects. The main barriers are detailed in Section IV, and include:

- ❖ Imperfections in the output market. In many countries access to the formal output market is linked with strict licensing regulation for the producer of goods and services. While strict regulation may be motivated by consumer protection, in many cases license access is restricted by insiders and administrative incapacity.
- ❖ Imperfection and regulations on the factor markets. On the labor market, heavy regulation provides ample incentives for entrepreneurs to keep workers off the official payroll. On the financial market, limited access to credits for consumers and

producers create another set of conditions rendering informal activities and non-participation in the mandated pension scheme rational.

- ❖ The regime switch implied by a move to the formal sector. While workers may gain access to a broader range of benefits, these typically imply high contribution rates for the whole bundle of services, and payment, in principle, of all direct and indirect taxes, related and unrelated to social security.
- ❖ Last but not least, bad system design and/or administrative weaknesses. The example most often cited is a weak link between contributions and benefits that renders contributions akin to a wage tax that individuals will seek to avoid.



An expansion of coverage, however, is not cost-free. As mentioned above, even an actuarially fair system provides strong rationale for individuals to stay away from formal social security. Hence, attempts to force increased coverage under a multi-pillar system through administrative and other means is likely to imply drawbacks:

- ❖ Disregarding the argument of myopia to motivate mandated participation, forcing individuals to participate in a (broadly actuarially fair) pension system implies the imposition of a savings path they may not have chosen on their own. In a world of perfect capital markets, individuals could off-set the forced saving through borrowing (dis-saving). In a not so perfect world, forced savings leads to individual welfare losses.
- ❖ If individuals consider the net-costs of forced participation to be too high, they will try to avoid and evade the mandated contribution, the latter typically by moving into informal sector activities. While this move is chosen to enhance their individual welfare, it is likely to have negative effects on the economy, including the choice of lower production technology and higher transactions costs (including corruption).
- ❖ The strategies for avoiding contributions can be manifold. Employees in sectors with strong union representation will attempt to shift the burden to the employer, to the detriment of the outsiders and employment. In the case of low competition output markets, the employer will try to shift the burden to the consumer. If self-employed are not required to participate in the system or can more easily avoid the burden, employees will notionally change to the self-employed status, which may weaken their bargaining power and overall access to social programs.
- ❖ Last, but not least, forced participation at high individual costs may weaken an existing informal safety net. Workers that care for their parents (and children) in an informal manner will have less resources to share with them, which may increase poverty among the current elderly not covered under formal provisions.

III. Pension Reform and Coverage: Illustrations from Chile and Argentina

Much of the literature on pension reform presents the single-pillar PAYGO model as a manifestation of government failure. Where the objective of governments has been to achieve greater equity through a redistribution of income within and between generations, the State has often established mechanisms that not only fail to bring about greater equity, but that also introduce distortions into the labor market that retard job creation in the formal sector and lead to a loss of productivity. The increase in coverage expected after the transition from an unfunded PAYGO system to a multi-pillar system with funded individual accounts is attributed to the correction of these distortions through reform. The labor market benefits of PAYGO-to-multi-pillar transition are widely held to be (World Bank 1994):

- ❖ the creation of a stronger link between contributions and retirement benefits that reduces the motivation to evade by eliminating a perceived unrecoverable *tax* on income;
- ❖ a reduction in payroll taxes and in the cost of hiring incurred by formal-sector employers;
- ❖ greater flexibility and cross-sector mobility in the labor market enabled by portable pension benefits; and
- ❖ reduction in incentives for early retirement and non-retention of experienced labor.

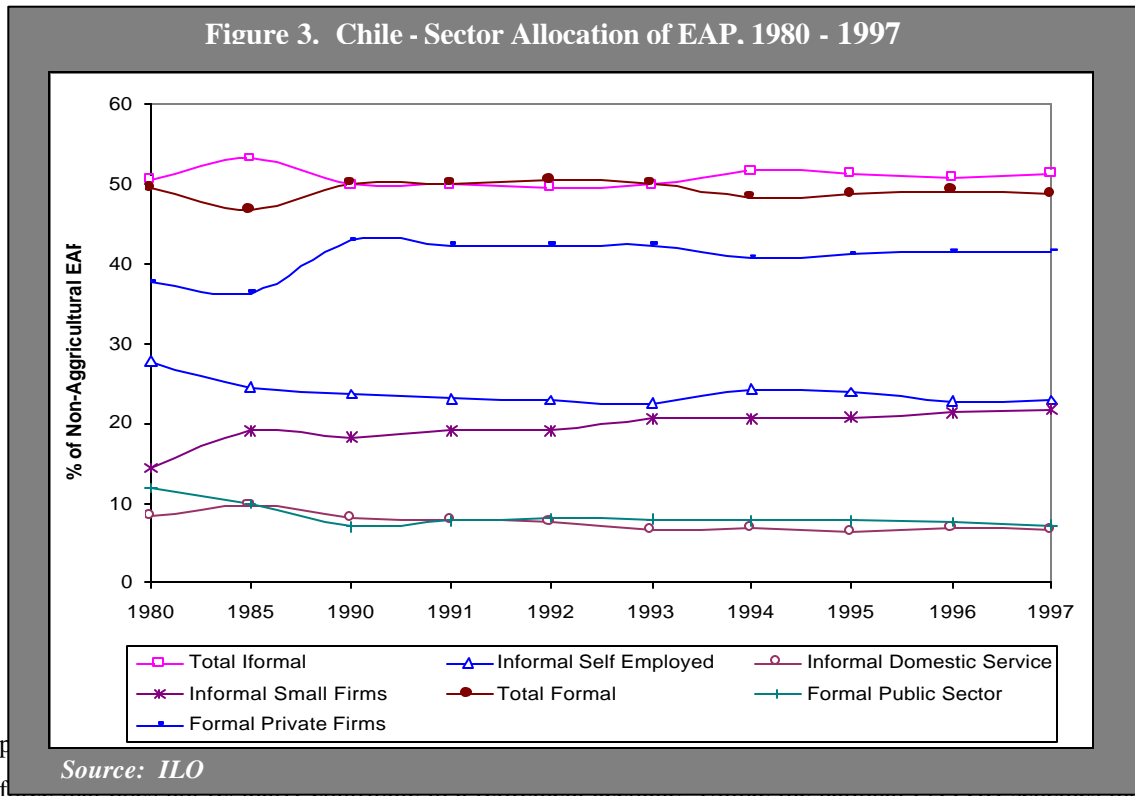
The simulations of the PAYGO-to-multi-pillar transition on which the incentive-driven coverage expansion is predicted are typically performed using overlapping generations (OLG) models with perfect foresight (see Auerbach and Kotlikoff 1987), raising the question of why participation in formal pension systems should be mandated. Publicly mandated pension systems are typically motivated by considerations of myopia – the failure of individuals to perceive future utility; insufficient or lacking financial market instruments; and protection of public resources against moral hazard and opportunistic behavior. The first two arguments imply that a mandated pension system should replicate the saving behavior rational individuals would manifest if they had full access to perfect market instruments. However, since it is difficult to design a collective system that accommodates the preferences of all individuals, it follows that any mandated scheme creates distortions and any contribution has a tax element, no matter how tightly the contribution rate is linked with benefits. This suggests that – *ceteris paribus* – moving to a multi-pillar scheme may reduce the tax element, but the effect is likely to be small and hence have limited positive incentive effects on coverage. If other obstacles and institutional barriers remain unchanged, lower coverage may even result. These considerations seem to be validated in the case of the reformed systems in Latin America, and are illustrated by the experience of Chile and Argentina.

Of the countries in Latin America that have reformed their public PAYGO plans and established systems of defined contributions into individual accounts, only in **Chile**, where payroll taxes fell from 19% to 13% (including commissions and the premium paid for disability coverage), has sufficient time elapsed to provide relevant empirical evidence of such an adjustment. **Figure 3** shows a disaggregated picture of how non-agricultural employment in Chile has evolved by sector from 1980 to 1997.

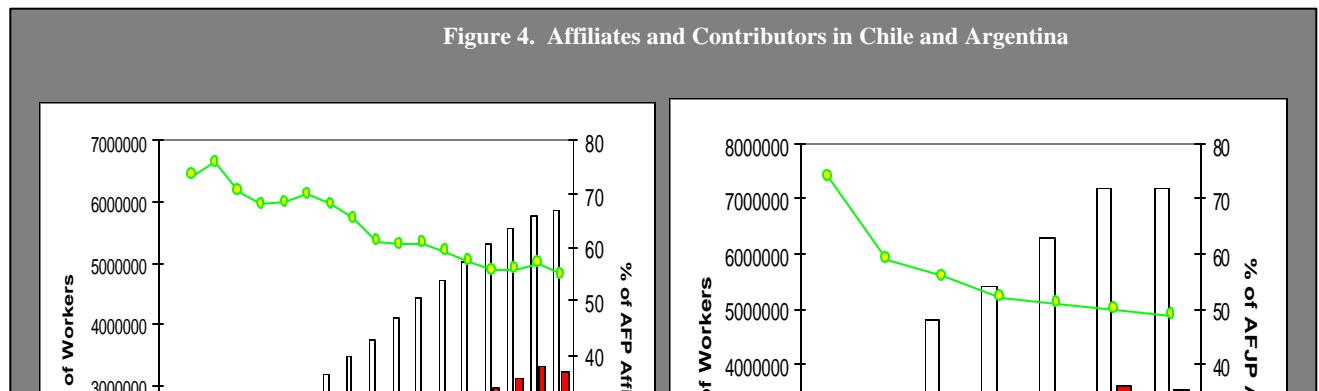
In Chile, where the AFP (*Administradoras de Fondos de Pensiones*) system of funded individual accounts has been in full operation for nearly nineteen years, that portion of the workforce that is informally employed has increased from 49.9% in 1990 to 51.3% in 1997. This relatively static picture of the trends in sector choice supports the assertion that the tighter link between contributions and benefits and the lower cost of formal-sector hiring brought about by pension reform may be a necessary but not sufficient condition either for formalization of the factors of production or to attract widespread participation in the new multi-pillar systems. This argument is further supported by studies of the Chilean

labor market that conclude that the new pension system has not caused significant changes in the number of workers, as a portion of total employment, who contribute regularly to social security (Cortazar 1997).

On the other hand, the data in **Figure 3** demonstrate that while informal sector participation has risen dramatically in other Latin American countries, sector participation trends in Chile have remained relatively stable since the introduction of the AFP system. Although there is insufficient empirical evidence to support the claim that a fully funded pension system of individual accounts will lead to a formalization of the work force, pension reform in Chile may have played an important part in slowing the growth of the informal sector (Schmidt-Hebbel 1998), but probably in concert with high rates of economic growth and employment creation in the formal sector.



they replace, retirement benefits in defined contribution systems are based on accumulated contributions and the returns they earn from investment. Under the reformed systems, regular contribution is critical to adequate income replacement in retirement, making “coverage” a more active, intentional concept than under the defined benefit framework and creating a group of “partially covered” workers (James 1999).



While worker affiliation to the AFP system in Chile may have increased since the reform, the portion of affiliated workers who regularly contribute into their individual accounts has actually fallen (Arenas de Mesa 1999; Mastragelo 1998). A similar, if more accelerated, fall in the number of contributing affiliates has been seen in **Argentina** since the introduction of its private AFJP pension pillar.³ Thus while the percentage of economically active workers considered “informal” may not exactly indicate the size of the *uncovered* population, a large and dynamic informal sector facilitates irregular contribution patterns by providing ample opportunity for unregulated/uncovered employment and easy exit and re-entry to formal-sector jobs (World Bank 1999). In effect, a large informal economy transforms first- and second-pillar forced savings into third-pillar investment choices. Each individual and household is then faced with the decision whether or not to participate in the formal pension system, depending on the set of viable alternatives to which they have access and the efficiency of each investment in terms of reliability and returns.

IV. Barriers to Participation: A Set of Hypotheses

This section sets forth a number of hypotheses as to why rational workers/households chose to avoid participating in multi-pillar pension systems. The hypotheses are grouped into five broad categories relating to: (i) the poor, (ii) the self employed, (iii) transactions costs, (iv) system design issues, and (v) system credibility. Each hypothesis is followed by a short discussion and suggestions for further research.

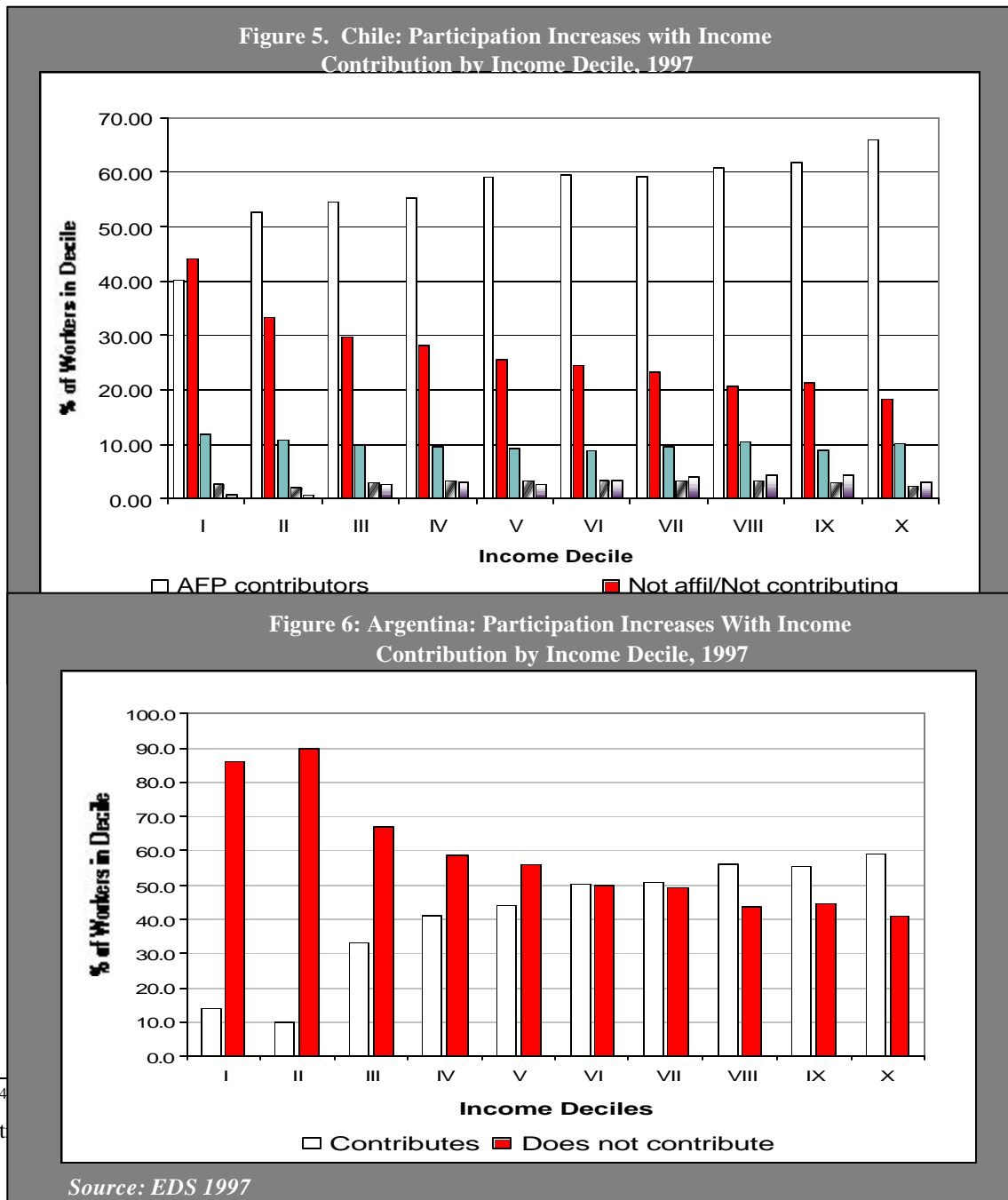
The Poor

Pension systems funded through mandatory contributions can lead to welfare losses for households for which rates of discount are high and credit constraints are binding.

In most developing countries a large segment of the population may simply be too poor to participate in contributory pension systems. Where household income may be just enough to meet

³ Readers should note that the introduction of the AFJP pillar in Argentina in 1994 was followed shortly by a deep recession brought on by the Tequila Crisis out of Mexico. The steep fall in regular contributors is likely explained by a rapid rise in unemployment, which reached 18% in 1995.

immediate, basic needs for survival, saving for old-age may not be rational. The rate of discount on future consumption of poorer households is relatively higher than that of wealthier households. Poorer households will put much greater value on consumption today than on consumption tomorrow or far into the future. If the time preference rate is higher than the market rate of interest and credit is expensive or rationed, the shadow discount rate is even greater.⁴ Thus, for lower income households, mandatory contributions can lead to major welfare losses, and participation in a formal pension system in which savings are illiquid may place an intolerable constraint on household efforts to smooth consumption. Household data from Chile and Argentina show a sharp rise in rates of participation in the formal pension system as income decile rises from the poorest to the richest (Figure 5 and 6).



In a related argument, income security in old age may not be the primary risk concern of poor households. The profile of risks faced by the poor may feature less predictable shocks to income such as disability and sudden illness more prominently. This line of argument is strengthened by the link between income (nutrition/health) and mortality: i.e. poorer people would rather consume income today than save and consume in the future when, because of their relatively higher mortality, they may not be around to savor deferred consumption in retirement. The greater priority for immediate consumption is also explained by myopia – the failure to recognize future utility.⁵

These factors combine to augment the implicit tax component of mandated retirement savings for poorer households. To illustrate, assuming a market rate of return of 5 percent in real terms and a subjective discount rate as typically estimated in the range of 18 to 20 percent, then simple compounding of contributions and discounting of actuarially fair benefits lead to some 20 cents per dollar of contribution. Put differently, the implicit tax share can be as high as 80 percent.

Traditional systems of old-age security may still provide better risk management for poorer households in developing economies.

There is ample evidence that poorer, economically active agents (as individuals, as households, and within households) engage in consumption-smoothing and exhibit risk management in view of fluctuating income. Where formal insurance markets have failed to coalesce or may have broken down due to moral hazard and adverse selection stemming from information asymmetries, the extended family and community have been able to partially fill the gap.

The majority of the world's old people rely solely on informal and traditional arrangements for income security (World Bank 1994a). These traditional strategies can take the form of larger families or preferences for male offspring in rural agricultural economies and in labor markets that wage-discriminate against women (Hoddinott 1992). Households may still depend heavily on reciprocal relationships within *tribe* or extended family; remittances arising from rural-to-urban and international migration of household members (Hoddinott 1992; Lucas & Stark 1985); strategic marriage arrangements (Stark 1995); intra household arrangements; the establishment of a portfolio of assets with uncorrelated risks (Stark 1990); the purchase of livestock or jewelry; the forward sale of agricultural crops; and community based credit schemes.

The portfolio of strategies taken by risk-averse households will necessarily depend on the relative costs and benefits of each, and their efficiency in balancing returns with risk (Holzmann and Jorgensen

considerations and numeric simulations under market imperfections, see Holzmann, 1984 and 1990.

⁵ Much of the literature on time preference assumes that the rate of discount is exogenous. New theories of endogenous discount rates suggest that not only will rates of time preference fall as agents gain in optimism for the future but also that agents play an active part in increasing optimism by pursuing strategies that will increase the likelihood of higher future utility – investing in *future oriented capital* (Becker and Mulligan 1997). In a related point, households are likelier to make investments in such future oriented capital if they have better information about what they will need to maintain (or increase) welfare when they can no longer work. Recent research shows that myopia can be decreased if workers are given an estimate of their income needs in retirement (Mitchell 1999).

1999). A portfolio of informal assets may have higher returns (own education or education of a child) and lower risks (beholden children) than those afforded by formal pensions. Formal pension systems based on compulsory savings may impose liquidity constraints on households pursuing informal/traditional arrangements for retirement security, thereby crowding out such arrangements. Furthermore, “coverage” offered under the formal pension system may not substitute for investment in informal arrangements that are often multi-functional (covering risks other than old-age poverty) and flexible to a worker’s (the household’s) particular need.

The transition costs of moving from informal to formal regimes of retirement security are too high.

Just as the transition from an unfunded PAYGO system to a funded multi-pillar can impose a double burden on a “transition generation” of workers, the move out of a regime of informal strategies into a formal pensions system may also impose high costs. Workers informally supporting an elderly parent – and who may have held credible expectations that their children would provide similar support when grown – upon moving into a formal system, would be expected to continue their support in addition to funding their own retirement. Similarly, opting for the formal system may brand a worker/household as untrusting or disdainful of “traditional ways”. Once branded untrustworthy the worker/household may be locked out of reciprocal systems of risk management, leaving them dangerously vulnerable to shocks other than the inability to work in old age.

The Self Employed

Contributory pension systems impose constraints on productive investments of the informally self-employed.

The constraints imposed by formal pension systems on the self employed (especially the poor self employed) are more binding on their investments in productive inputs than on their ability to smooth consumption. The rate of interest on borrowing for investment in small enterprise can be very high – even infinite – while the net marginal returns to a unit of capital invested in small enterprise may be considerably higher than the returns from investing the same unit of capital in an AFP account. Avoidance of the formal pension system may be optimal given capital and credit constraints on productive investment choices of the self employed and the opportunity costs of vesting scarce capital in an illiquid retirement account.

Where formal retirement security is bundled with unrelated government regulations and taxes, the costs of compliance may be too high.

Coverage under a formal pension system is often nested deeply within the broader regulatory framework of the formal economy. Participation may require compliance with regulations and labor standards unrelated to the provision of income security in old-age.

How retirement contributions are collected can also impose secondary costs. While there are recognized efficiency gains from collecting contributions together with other taxes, where collection is centralized the self-employed (and employers in small firms) will find it difficult to divorce their

participation in the pension system from overall compliance with a tax code they may continue to perceive as unjust (Schwarz 1998). Pension contributions, even if perfectly linked to benefits, are then perceived by association as another tax to evade. Participation in the pension system can, therefore, invite constraints on the rational, individually utility-maximizing behavior of informal economic agents (De Soto 1989; Tokman 1992). There is a likely trade off between fiscal efficiency from linking contribution collection to collection of taxes and the incentives to participate. The more the State relies on pension systems to increase collection of unrelated taxes and enforce labor regulations, the deeper it will cut into incentives to participate.

Moreover, a fixed contribution rate and the inability to draw on their saved funds in times of hardship may place unacceptable constraints on the self employed whose incomes are episodic and whose financial needs are less predictable. This is especially true of farmers and rural non-farm self-employed whose wealth is held in illiquid forms (accruals in farming capital and “on the hoof”, but little cash) and whose income is largely seasonal. An AFP account might be more attractive to agents with irregular incomes if they were allowed to use their retirement balances as collateral to borrow and/or withdraw a limited amount in case of emergencies, with penalties for failure to replace the withdrawn amount after a specified period.

Self employment may attract individuals who prefer to bear a greater share of old-age income risk than to rely on government mandated pension systems.

There may be a high degree of self selection into informal self employment. The self-employed may prefer to bear a larger share of retirement income risk and take a more active role in managing their long term savings and investments. They may even be relatively less myopic than wage/salaried workers. Research should examine whether the self employed as a group take greater precautions for retirement security by analyzing the past labor market status/sector choice (salaried or self employment) among the current elderly not receiving pension benefits (past evaders).

A casual poll of taxi drivers in Santiago and Buenos Aires reveals that at least some self employed are pursuing alternative market strategies for retirement security, investing in financial sector instruments other than the second pillar retirement accounts. In Chile, term life insurance policies (*seguro de vida con ahorro*), available since 1995, seem to offer a competitive alternative investment.⁶ Private insurance

⁶ Similar to policies offered in the US, the *seguro de vida con ahorro* in Chile offers an attractive insurance/savings option. Santander’s policy, Super Futuro, guarantees a market rate of return on the savings portion that will not fall below UF+4%. Policy holders can insure up to a certain amount in benefits in case of death without having to undergo medical examination. Partial withdrawals can be made from the savings account after 3 years of paying premia. At the legal age of retirement, the policy holder can withdraw the full balance in his/her savings. Although premia are taxed, the returns to the savings account and withdrawals are tax exempt (conventionally, TEE). A close study of the profile of policy buyers in Chile should be considered, since the features of the life insurance with savings policies resemble funded defined benefit/deferred annuity plans. The self-employed may be demonstrating a preference for pension plans with an absolute return guarantee over the relative return guarantee offered by the AFP system. Alternatively, they may simply value the access, however limited, to a portion of their savings. Allowing workers to withdraw a portion of their savings could imply very low balances at the time of

companies in Chile report that, while it is likely that the policies are prohibitive for poorer households, there is considerable demand for these life insurance/savings facilities among middle- and lower-income groups, especially younger age cohorts for whom premiums are low.

System Transactions Costs

The cost of pension fund administration cuts into account balances, lowers returns and increases the implicit tax on participation.

There is a mutually reinforcing vicious cycle between low rates of participation in the new multi-pillar pension systems and their high administrative costs. The fewer the workers who affiliate and regularly contribute to the system, the harder it is for the fund managers to lower costs by exploiting economies of scale. If costs to the workers remain high, the returns from the system will be low relative to the returns that can be earned from other formal and informal retirement investments, making the opportunity costs of participation prohibitive for poorer households.

A large body of literature has been written on the commissions and fees charged by second-pillar fund managers and whether these commissions are high relative to the fees charged by similar agents – banks and mutual fund managers – in developing capital markets. These costs are especially high for poorer households and workers who frequently enter and exit the formal labor force (Srinivas and Yermo 1999). The prices exacted by the AFP managers in Chile's second pillar have been blamed for increasing the perceived tax component of retirement contributions (Torche and Wagner 1997) and encouraging evasion.

Valdes-Prieto (1998) finds that in Chile, while AFP commissions are lower than those charged by mutual funds, the charges on an AFP retirement savings accounts are 60% greater than those on a regular savings deposit in a private bank. Other researchers contend that charging commissions as a percentage of wages is cheaper over the course of the workers' contributing life than commissions as a percentage of earnings or accumulated balance. A branch of this research suggests that AFP commissions are competitive, especially when the additional educational services that the pension fund managers provide to their affiliates are considered. The level of commissions and fees may be justified when the value of the "financial education" received by the average affiliate – who may have no other contact with the formal financial sector – is taken into full account. This is a claim that still needs to be investigated.

retirement. Evidence from Singapore suggests that workers are likely to exhaust their retirement savings if access is permitted.

The transaction costs of providing financial services to the working poor are too high to attract the interest of fund managers, eliminating incentives to affiliate rural and urban informal sector workers.

Where a market for private management of pension savings has developed, the high costs of providing financial services to contributors with lower and more irregular incomes may deter fund managers from affiliating informal sector workers. The costs of collecting contributions from often mobile workers and of reporting to informal affiliates the balances in their individual accounts may be high when compared to the low commissions (as a percentage of wages) that the fund managers can earn. Furthermore, providing savings facilities to workers with lower surplus incomes involves diseconomies of scale. Disincentives to the AFPs are compounded in the case of informal workers in rural areas where transactions costs are even greater due to population dispersion and information asymmetries.

However, much has been learned in the last twenty years from the practical experience of community-based organizations (CBOs) and micro-finance institutions (MFIs) that have developed methodologies to dramatically reduce the costs of providing financial services to the working poor. MFI's have experimented with different ways of structuring financial contracts and with developing supervision mechanisms that reduce information asymmetries and consequent costs. Emerging evidence reveals a demand among the working poor for formal savings facilities (Alderman and Paxson 1992; CGAP 1997). In Bolivia, organizations like BancoSol (formerly PRODEM) are already offering medium and long term savings accounts to their clients as well as positive returns to shareholders.

While most MFIs lack the capacity to invest workers' savings, there is still an important role they can play. The greatest costs to AFPs from affiliating the urban and rural poor arise from contribution collection and disclosure of account information. These are services in which the MFIs pose an institutional comparative advantage. There should be room for trade in financial services between AFPs and MFIs.

Structural Factors

The benefit structure of minimum pension guarantees introduces deterrents to the participation of poorer households as well as perverse incentives and moral hazard.

Minimum pensions guaranteed by the government are often blamed for being both deterrents to participation and the source of moral hazard. A poverty trap may be created when poorer households that do not expect to qualify for the formal minimum pension guarantee decide not to participate. The minimum guarantee can also create incentives for workers to participate only until they have complied with vesting requirements and to evade thereafter.

In the Chilean AFP system the government guarantees a minimum pension to affiliates who have contributed for at least 20 years. In Argentina, workers must contribute to the system for 30 years before qualifying for the state-guaranteed minimum pension. There is evidence in both Chile and Argentina of strategic under reporting of wages by workers – especially the self employed – who may be seeking only the government-guaranteed minimum. The barrier to participation posed by discrete vesting requirements

could be removed by applying both vesting and the guaranteed benefit continuously. For example, a worker that contributes to Argentina's reformed system for only 25 and not the required 30 years would receive some benefit proportional to his/her years of contribution instead of receiving no benefit at all.

The strongest motivation to regularly contribute to a second-pillar retirement account is not income security in old age, but rather to gain access to health insurance and better health care.

Surveys of the informally employed show a greater demand for formal health insurance above all other forms of insurance including retirement (ILO 1997). The greater demand for health coverage is not surprising since the returns from a worker's investment in health insurance are usually enjoyed over his/her lifetime, while those from formal social security and pensions are only enjoyed in old age. All other things equal, the tighter access to health coverage (or disability) is bundled together with the pension system, the more attractive regular participation will be.

Although the self-employed in Chile are excused from participation in the pension system, many informally self-employed who are otherwise neither regulated nor directly taxed contribute to an AFP in order to gain access to health insurance (both to FONASA, Chile's state health insurance scheme, and to the ISAPRES, the country's private providers). There are even reports of workers contributing to an AFP for a determined period in order to secure access to health care when they need it most, such as during a pregnancy. In Argentina, health insurance was separated from the privately managed pension system, and is still financed through pay-roll taxes to union-organized group policies called "*obras sociales*", however, access to health insurance and care is just as tightly linked to participation in the reformed pension system as it is in Chile.

Where employers are required to pay a larger payroll contribution relative to workers, the employer will have more to lose (gain) from participation (evasion) than the worker will have to gain (lose).

With the introduction of the multi-pillar model, employer contributions are often retained to finance government liabilities from the old regime, and/or first-pillar benefits, while workers' contributions are left to accumulate in a second-pillar account. While the worker's contribution to the second pillar may no longer be perceived as a pure tax, the employer's contribution to the first pillar on the worker's behalf may be.

The ratio of employer to worker contributions can influence the decision to participate or to evade. High employer contributions relative to the contributions of workers provide the employer with a greater incentive to evade and to *informalize* his/her workers. Even if the worker fully perceives future utility (is "*clairvoyant*") and would like to benefit from participating in the formal system, the decision to contribute may not be his/hers to make.

A shift in the employer/worker split can correspond to a shift in the bargaining position (and threat points) of each in negotiating terms of employment, including whether the contract will be formal or informal. The extent to which the employer/worker contribution split will effect the decision to participate

(to comply) will be determined by the elasticity of labor supply (affected by range of informal employment opportunities) and the existence (and importance) of institutions (such as unions, labor codes) that prevent employers from shifting the entire burden of payroll taxes onto the worker by reducing net wages.⁷ If the employer does not coerce evasion outright, he/she may collude with the worker to avoid the costs of participating by adding a portion of would be retirement contributions to the workers' take-home pay (Schwarz, 1998). All other things equal, a higher ratio of employer/worker contributions is expected to lead to lower participation in the formal system.

The establishment of a specialized private pension fund industry to manage mandated worker savings can discourage competition and slow a downward adjustment in commissions.

Observers suggest that the regulatory framework for the new second-pillars, while designed to protect affiliates, often creates biases against competition, efficiency, and specialization. The PAYGO-fully funded reforms in Latin America often "...confer a collective monopoly of managing mandated savings..." to the new fund management industry, excluding other financial intermediaries from competition for affiliates, and limiting market forces that in time would lower second-pillar costs⁸ (Shah 1997). In Argentina, there is growing concern that recent market consolidation will further hurt competition, and as the AFJPs increase their efficiency and cut their costs, these savings are not being passed on to affiliates.⁹

Current regulation of pension fund investment causes distortions, limits returns and restricts workers' choices, making participation less attractive relative to market alternatives.

The regulation of the market structure and investment decisions of second-pillar fund managers has been described as "draconian" (Vittas 1996). Although strict regulations may be justified to safeguard workers' retirement savings from the risks of developing capital markets in the first few years after a pension reform, they impose significant costs over time. Analysis of pension fund investment performance in Chile, Argentina and Peru, has shown that restrictions on investments (especially on investment in equity and foreign issues) create distortions in asset management, limit opportunities for diversification, and constrain workers' choices as the funds in these countries are earning almost the same rates of return (Srinivas and Yermo 1999).

⁷ Recent findings from labor market analysis in Brazil would complement the "contribution split/bargaining position" hypothesis. Gill 1998 finds that since labor market institutions favor the worker and strengthen their bargaining position in negotiating the terms of the contract, workers in the formal and the informal sector are able to take employers to court to demand coverage under any of Brazil's social security and unemployment insurance programs.

⁸ While the creation of a special pension-fund industry might be justified in the first few years after a reform, and it is certainly prudent to build fire walls between workers' savings and fragile financial institutions, over time these precautions should not be allowed protect an entrenched AFP market from outside competition.

⁹ The SAFJP has noted that as the price of disability and survivors insurance premiums falls, AFJP commissions have remained steady since the inception of the system in 1994.

The investment choices of account holders are further constrained by the limit of one pension fund per fund administrator. In most countries that have adopted the multi-pillar pension model, the investment of a worker's savings is restricted to a single fund that is invested mostly in government bonds.¹⁰ This restriction makes it impossible for workers to shift the risk/return profile of their investment in the second-pillar account from a more aggressive holding when they are still young and risk-tolerant/return-hungry to more conservative fare as they become older and more risk averse (Shah 1997).

The financing of the transition toward multi-pillar and/or the new benefit structure make participation for some participants less attractive.

Moving from single-pillar PAYGO to a multi-pillar system imposes a double burden on transition generations if the implicit debt made explicit is repaid and the reform does not create sufficient externalities (such as lower labor market distortions or growth effects from financial market development), which can be used to repay this debt (Holzmann 1998). Since these externalities take time to materialize, transitory budgetary financing will lead to an increased tax burden for the working population, with the size and effects depending on the form of taxation (labor, income or consumption tax). However, in many cases the additional taxation will lead to incentives to avoid or evade formal labor market participation.

The negative participation and hence coverage effects on certain groups of the working population, particularly the poor, will be enhanced if the new benefit structure provides a lower rate of return. Not everybody under the old PAYGO system received a low (implicit) rate of return – the rate was sometimes high for the poor, due to high minimum pensions and low eligibility requirements, and individuals with very steep earnings profiles and pensions calculated on last years earnings only.

Credibility of Reformed Systems

Households may put little stock in the promises of government. Reformed pension systems may be suffering from an inherited lack of credibility associated with formal pensions institutions.

Workers'/households' idiosyncratic rates of time preference are to an extent determined by their individual preference/tolerance for risk. Under a public PAYGO system, risk to the worker is defined by his/her failure to receive the promised pension. Even if workers were fully aware of the implicit guarantees in the benefits defined by social security legislation, they might have perceived a high political risk to their promised pension stemming directly from a government's lack of credibility. If the government had a track record of frequently changing the "rules of the game" (vesting requirements, the benefit formula or minimum pension guarantees); if the inflation tax was high; and if funds earmarked to pay retirement benefits were mismanaged or depleted, workers might have considered the risk of not receiving a PAYGO pension too high, and thus may have heavily discounted the returns to being covered. The high risk of not

¹⁰ In Mexico a second fund, primarily of equity holdings, is contemplated in the 1995 reform legislation but has yet to be implemented.

receiving the defined benefit, coupled with high transactions costs of compliance or costs (in other taxes) of participating in the formal economy, may have fully eliminated returns to participation in the system.

Both real and perceived political risk is a difficult and enduring legacy that may inevitably color workers' perceptions of any government mandated retirement security program. Post-reform, the political risk to the new system perceived by workers may still be high, even if reforming governments have attempted to start with a clean slate by establishing new private pensions institutions and new public authorities to regulate them. Workers may not put stock in the reform of a government that has frequently changed vesting and benefit rules in the past.

Households may find the burden of financial risk in the post-reform systems to be too high. Exposure to capital market investment may (positively or negatively) influence the decision to participate or to evade.

A criticism of defined contribution systems is that they require workers to assume too much risk to their income security in retirement. While under public PAYGO regimes government assumed a hefty share of risk (longevity and financial risk), under the reformed systems workers are often burdened with the full weight of risk.¹¹ Although these risks stem from many sources (systemic, demographic and financial) and can be minimized in a variety of ways, we are concerned with how workers will behave – whether they will chose to participate in the new system, or not – when suddenly confronted by a new set of financial risks shortly after a reform.

Under a fully funded system of individual accounts, risk is defined by greater certainty of receiving some pension but uncertainty as to the level of the pension, or of an accumulated balance sufficient to guarantee an adequate stream of income in retirement. However, the premise that workers' decision to participate is somehow affected by systemic or financial risks (real or perceived), rests on the assumption that workers have information on the workings of the financial sector or have had the opportunity to build expectations of these workings, either through participation in the form of own-investments or through the participation of a close friend or family member (*learning by observing*). To the extent that workers have previously (i) held financial assets, including a bank account with time-deposits, and/or (ii) have relatives who have held financial assets, the premise is stronger.¹²

If, on the other hand, workers have had no previous contact with the financial sector and no experience of the earnings and loses that can be made on the capital market – if as is often the case, workers are paid in cash and do not even have a bank account – they may not even have a bench-mark perception of the risks and returns from participating in the new system. Systemic and financial risks would not enter into the rational worker's perceptions and decision-making. These workers may even fail to perceive the elimination of the pure tax component of mandatory retirement contributions.

¹¹ How risk to retirement income security is diversified post-reform varies from country to country. In Chile, Mexico, Peru and El Salvador, a greater share of financial risk is borne by the worker. In Argentina, Uruguay, Colombia and Bolivia, a large portion of risk is retained in the tax-financed pillar.

Workers may be uncomfortable with the “privatization of social security”, and have little faith in the profit motives of the private sector.

While the credibility of the government and that of the publicly managed pension system may not have been high in the past, the credibility of the new private fund managers in the funded pillar may not be much higher. This may reflect a simple lack of information or familiarity with the financial sector; mistrust in the profit motives of the capitalist system and its visible representatives – the financial market institutions; or a negative past experience with unregulated or government related financial system, i.e. “crony capitalism”.

The first two obstacles to greater credibility can be partially overcome by increased disclosure and education, while the last requires structural and political changes in the pension system as well as the financial sector. In Eastern Europe and Central Asia where disclosure is minimal, information about financial markets is scarce, and the impact of recent economic shocks has been widely felt, governments have established publicly administered “accumulation funds” alongside the new privately managed pension funds to ease the transition. Any measure aimed at increasing the credibility of a privately managed system, however, requires time for its impact to be felt.

The list of hypotheses presented in this section is by no means exhaustive. Rather than providing a single explanation as to why workers/households choose to evade participation in multi-pillar pension systems, the discussion suggests that the roots of the coverage problem are multiple and intertwined.

V. Preliminary Econometric Evidence from Chile and Argentina

In this section we discuss the results of exploratory econometric tests performed on data from the 1996 CASEN in Chile and the 1997 EDS in Argentina. In order to substantiate the prior Section, we have attempted to test as many of the hypotheses as the available data will permit. The tabulated results of our analysis as well as a fuller discussion of the data employed, and its limitations, is provided in **Annex I**. Readers are cautioned from the onset that the surveys chosen are not uniform in breadth or depth, and thus the results presented in this section cannot be compared. Further, the results are preliminary and are intended primarily to illustrate the need for sharply focussed data collection and further research.

Methodology and choice of variables

We have chosen a simple methodology to test several of the hypotheses outlined in Section IV – the estimation of *probits* on participation to the formal pension system. This method evaluates the

¹² The “learning by observing/by doing” hypothesis presents additional motivation for an investigation of workers’ economic and financial awareness.

significance, positive or negative impact that a number of explicative variables have on the probability that a working age individual will contribute to the formal (AFP or any) pension system.

The variables included in the probits were selected with an eye to the hypotheses in Section IV and the richness of each database. We do not claim that our selection is either exclusive or exhaustive. A number of alternative variables to those chosen could have been used to test the hypotheses – whether traditional social security strategies act as substitutes to the formal system, for example (gender rather than simply number of children, or contribution to the household of resident elderly rather than their number). In several instances we were obliged to construct imperfect, proxy variables to test our hypotheses; to illustrate, we used a targeted housing benefit to measure liquidity constraint.

We grouped the variables into sets according to the hypotheses being tested. The first set of variables reports on the impact of the individual characteristics (gender, marital status, age category, and educational attainment). This last variable has the additional benefit of acting as an instrument for income.¹³ A second set of variables test whether the demographic and geographic characteristics of the household (number of children and number of elderly residing in the household and dummy variables accounting for region and urban/rural location) affect the probability of contributing toward a pension. The third set, welfare variables, includes both individual and household characteristics: the former refer to the contribution to health systems, while the latter to the existence of students receiving private education in the household.

For the probits on data from Chile, the set of variables capturing labor characteristics includes a composite index of labor status: this index starts at 0, for those out of the labor market, and rises with the unemployed, and increasing degrees of formality. *Formality* is defined over two main parameters: the existence of a contract and the time tenure of the job (permanent vs. temporary/occasional). In addition, we include dummy variables isolating the self-employed in three key sectors: agriculture, manufactures and services. The inclusion of these dummies simultaneously tests whether self-employment is in itself a decisive variable on contributions to AFPs *and* how that impact varies across sectors. Finally, we explore the role of incomes accruing from sources other than labor and access to credit using two dummies.

To the extent possible, we used variables in our estimates for Argentina equivalent to those for Chile. We included individual and household characteristics, constructed a similar *informality index*, and used a housing-finance subsidy to proxy for credit constraint. To accommodate asymmetries in the chosen surveys, we used a single variable for contribution to the health system. Furthermore, we placed greater emphasis on reported secondary jobs in order to capture the influence of secondary employment – and in particular secondary self employment – on a worker’s decision to contribute to a pension system in Argentina.

The Determinants of Pension Participation in Chile (see Table A1 in Annex 1)

¹³ In fact, while education is highly correlated with individuals’ incomes, its correlation with other variables is typically smaller than that for income.

The results from the probits for Chile show few surprises. As education rises, so does the probability of contributing to an AFP account (or to any pension regime). Hence, not only are larger stocks of human capital a determinant of participation, but ultimately higher income level increases the probability of regular contribution. Women are less likely to contribute than men, and even less so if they are married. However, in general, married individuals tend to participate more. We attribute these phenomena to differentials in labor participation: women, and married women in particular, participate much less in the labor market than do men.¹⁴ Consequently, they are less exposed to the government's mandate to contribute to the pension system.

The relationship between age and likelihood of contribution does not follow a linear trend, as anticipated. However, our results suggest that as individuals age over forty, the probability that they will contribute to an AFP decreases with respect to the control group (those 15-29 in 1996).¹⁵ Although this is understandable for age groups near or beyond the retirement age, it is counterintuitive for the 40-49 age group. Note that the counterintuitive result disappears when we consider contributions to *any* pension system.

As expected, household demographics affect the probability of contribution both to AFP and other systems. Each additional child a family has lowers the likelihood that individuals in that household will contribute. However, the reverse holds for the number of elderly in the household. This result may indicate that more children reduce time supplied to the labor market as a result of childcare responsibilities, while the presence of elderly relatives, who may fulfill this function, increases the number hours working age household members will sell. Note that the test on the specification of the number of children indicates a linear specification: it might be that older siblings are not given the responsibility of caring for younger siblings, or more likely, that even if they are, this does *not* significantly effect the labor supply decision.

Living in Greater Santiago increases the likelihood of contributing to AFP but does not increase the likelihood of contribution to the other pension schemes, while living in rural areas decreases that probability. This result supports the hypothesis that the transactions costs that usually accompany the provision of financial services in rural areas may be dissuading the AFP supply and worker demand alike. There also appears to be a clear link between AFP participation and contribution to the health system. The likelihood of contributing to the pension system increases as we move from the indigent and the poor up the income ladder to the less poor. Enrollment in an ISAPRE increases the probability of AFP contribution (and pension contribution generally) the most. Interestingly, those who purchase more exclusive health insurance are *less* likely to contribute.

The most significant variable in our exercise is a worker's degree of formality (as defined previously). As formality increases, it is more likely that the individual participates in the AFP system. Typically informal occupations such as the self-employed exhibit decreasing probability to contribute to an

¹⁴ This is true in Chile and across Latin America.

¹⁵ Note that individuals in the 15-29 group in 1996 are the only group that was not yet in the labor market at the time of the 1981 reform. This group constitutes the only workers who did not choose between the old PAYGO and the new AFP system.

AFP, this being especially true in the agricultural and manufacturing sectors. The critical factor that is most likely driving this result in Chile is that the self-employed are *not* required to participate in the pension system. The result reflects the lower rates of contribution shown in earlier descriptive statistics. However, that the only group of workers that are not forced to participate largely *chooses to participate less* than salaried workers could be used as evidence to support a number of hypotheses: that agents *are* myopic; that superior, alternative strategies of minimizing income risk in retirement prevail; or that the self-employed are less myopic and pursuing alternative strategies more suitable to their needs.

The Determinants of Pension Participation in Argentina (see Table A2 in Annex 1)

Once again, readers must use caution in interpreting the results of our estimates. The construction of the key variable, *contribution to the pension system*, in the EDS introduces a structural bias into the model. Since only private sector wage employees are asked whether they contribute to the pension system, all other occupation categories are *automatically* classified as non-contributors. Furthermore, some of the data used to construct the variables included in the Chilean estimate are unavailable in the EDS data base. A further bias in the results arises from the urban sample frame employed in the EDS. As demonstrated from the estimates using data from Chile, the determinants of participation in the pension system have a significant rural/urban dimension.

These caveats notwithstanding, the results in Argentina, as was the case in Chile, show few surprises. Education has a positive and significant sign. Individual characteristics all have the predicted signs and are significant, except for the gender category. As age increases, we observe increases in the probability of contribution, except, of course, for those in the retirement age, 65 and older. Household demographic variables also behave as predicted. The linear specification of the number of children in the household is preferable to non-linear specifications: the sign on the variable is both negative and significant. In Argentina, as well as in Chile, a large number of children may be substituting for formal social security, while the number of elderly in the household raises the probability of contribution.

Geographically, living in the province of Buenos Aires, as opposed to other regions, has no noticeable impact on contribution. This is interesting as, to a large extent, Argentina and Chile are geographically comparable: a big metropolis for capital and extremely distant regions. However, the metropolitan region in Chile was found significant even for the all-pension regime probit estimation. Whether information or infrastructure costs play an important role is difficult to gauge as we have no information on rural areas.

As in the Chilean estimate, *degree of formality* is the most significant determinant in our estimates, even when, due to the limitations of the EDS questionnaire, the *formality index* in Argentina leaves out a critical variable, the “nature of labor contract”. As explained earlier, self-employment dramatically decreases the probability of observing pensions contributions, reflecting the bias in the EDS questionnaire. More interestingly, having a second occupation in addition to salaried employment (secondary self-employment) does *not* reduce the probability of contribution, but rather, increases it. This

result contradicts the fundamental assumption implicit construction of the EDS questionnaire, namely: individuals in activities other than salaried employment do not contribute to formal social security.

Finally, contributions for health are again strongly associated with contribution toward pensions, probably reflecting the tight link between Argentina's *obras sociales* and the Integrated PAP/AFJP system. The educational welfare variables and access to credit variables (the latter, also a proxy: subsidized housing finance, as in Chile) were found not to be significant.

Preliminary Conclusions

The exploratory econometric exercise has many (data) limitations, and this strongly supports the call for development of a specialized data set to permit better discrimination between alternative and complementary hypotheses for non-participation in a multi-pillar pension system. Still, despite its limitations, the exercise strongly supports the conjecture that individual/family circumstances matter for participation in a formal pension scheme, and most parameter estimates are consistent with the underlying hypotheses, in particular:

- ❖ The lower participation of the poor/less educated in a mandated pension scheme;
- ❖ The special situation of the self-employed – although the currently available data do not allow us to distinguish between the effects of credit constraints or differences in risk-taking behavior;
- ❖ The effect of household composition on participation and the potential influence of informal/traditional retirement strategies;
- ❖ The interaction between the pension system and access to other social programs, most importantly health coverage.

To confirm these results, to distinguish between competing explanations, and equally important to test other hypotheses such as the impact of transaction costs and system design, more and different data is required.

VI. Ongoing and Future Research

This section describes ongoing research on the barriers to participation in reformed pension systems. These efforts include a comparative study linking coverage under the reformed pension systems of Chile and Argentina and social risk management, and an evaluation of coverage expansion policies in other Latin American countries that have reformed social security.

Comparison of Coverage and Household Social Risk Management in Chile and Argentina

Although this paper makes a first attempt at explicative analysis for low rates of participation in reformed pension systems in Chile and Argentina, the depth of investigation is severely constrained by limitations of the data currently available. However, the contrasting political and economic environments under which social security reform was undertaken, the varying depth of reforms, and the differences in the

formal pensions institutions that were adopted in Chile and Argentina provide an excellent opportunity for rich, comparative analysis. A comparative approach to the study of coverage and household social risk management will allow for the isolation of the impact of important structural differences between the two reformed pension systems on the decision to participate (as hypothesized above).

Of particular importance to the examination of household participation and coverage will be: (i) contrasts in the role of government in each of the reformed systems; (ii) the structure of government guarantees; (iii) financing of transition costs; (iv) centralized versus decentralized collection systems; and (v) treatment of the self-employed under the two regimes – **voluntary** versus **compulsory** participation in the reformed systems – and the effect mandated participation has had, if any, on the extent of coverage.¹⁶ A *Social Risk Management Survey* (SRMS) – focussed on risks to income in old-age, and combining elements of labor, household, consumption and expenditure surveys – will be conducted in Chile and Argentina to gather data on household awareness of the reformed systems, preferences for alternative retirement security investments, financial literacy, access to credit, perceptions of mortality and contingent risk-coping strategies (See Annex 2 for outline of survey structure).

Table 1. Features of Reformed Pension Systems that May Influence the Decision to Participate

Feature	Chile's AFP System, 1981	Argentina's Integrated System, 1994
Nature of Reform	Public defined benefit (PAYGO) changed to private defined contribution (all workers)	Separate regimes consolidated. Public split into public PAYGO and private defined-contribution
What happens to the old system?	Phased out	Continues with changes
Is second-pillar mandatory for new labor force entrants?	Yes	No, workers have a one-off choice of participating in PAYGO or AFJP system
Treatment of self employed	Voluntary	Obligatory
Structure of public pillar	Minimum Pension Guarantee (MPG) Social Assistance	Flat and minimum pension
Financing acquired rights under old PAYGO	Recognition bonds financed with future general taxation	Compensatory pensions financed partially through current pay-roll taxes
Total contribution rate for new system...		
- for old age annuity	10	8
- disability/survivors/commissions	3	3
- public pillar and social assistance	General Revenues	16 ^e

¹⁶ To illustrate, to the extent that the self-employed affiliate voluntarily with a Chilean AFP, the significance of income level, occupation, and a number of household factors on the decision to participate can be examined.

Total contribution rate... ⇒ before reform ⇒ after reform ⇒ employer/worker	19 13 0/13	27 27 16/11 employer contribution is pure PAYGO taxation, for the universal flat benefit
Collection of contributions	Decentralized: Employers pay to fund managers, with follow-up enforcement by regulator	Centralized: Employers/workers pay contributions, along with taxes on income and other tribute, to single tax authority (DGI)
2 nd Pillar commission structure	<i>fixed</i> : although variable on contributions, on combination, no discounts	<i>Variable</i> : on contributions, discounts for length of period affiliated/contributing to AFJP
Maximum percentage of portfolio allowed in... ⇒ Domestic equities ⇒ Foreign securities ⇒ Gov't securities (in 1994)	30 12 50	63 17 65
Second pillar contributors as % of affiliates	57%	48%

The Effectiveness of Government Interventions to Increase Coverage

Several governments that have adopted the multi-pillar pension framework have included special features and mechanisms in their reforms to “graduate” workers into regularly contributing to a second-pillar account. The efficiency of these programs has yet to be formally assessed or their impact on coverage to be measured. Some of the programs that should be evaluated include:

- *The Social Quota in Mexico*: Private sector workers in Mexico began to affiliate with pension fund managers in February 1997. By December 1997, most privately-employed formal sector workers (96%) formerly covered under the public PAYGO system had elected a private fund manager to invest their retirement savings. Partly as an incentive for workers to affiliate with the new system, the government deposits *Pesos* \$1 per day into the retirement accounts of contributors, indexed to the consumer price level (CPI) and estimated to be between 1 and 5.5 percent of worker salary, depending on the workers’ incomes. On average, the Social Quota will be equivalent to 2.2 percent of wages (Cerde and Grandolini 1998). The pension authorities have yet to report on the impact the Social Quota has had in terms of new affiliates to the formal pension system.
- *Second-Pillar account subsidies in Colombia*: Colombia introduced a new pension system of privately managed accounts in 1994. The government has experimented with a targeted program that subsidizes contributions into the second-pillar retirement accounts for informal sector workers. The subsidy is meant to integrate the informally employed into the formal system. Formal sector workers earning more than four minimum wages contribute an additional one

percent of their income that, along with matching transfers from the government, makes up a publicly managed *Solidarity Fund*. Revenue from this fund is used to subsidize the participation of lower-income workers. However, the subsidy is not universal to poorer workers but targeted to certain areas (Queisser 1998)

- *Subsidized second-pillar participation in Uruguay:* In Uruguay, participation in each pillar of the reformed pension system is determined by a worker's level of income. Authorities have reported a rise in participation in the national pension system since the government undertook a structural reform of social security in 1996. The Uruguayan government attributes this rise not only to the correction of perverse incentives that prevailed under the old PAYGO scheme, but also to the option afforded to workers whose income falls below a certain threshold¹⁷ to split their pension contributions between the remaining PAYGO pillar and their individual retirement accounts. To encourage the participation of lower-income workers, reform legislation allows workers earning less than five-thousand pesos per month to contribute up to half of their mandatory 7.5% PAYG contribution (3.75%) into an individual retirement account. The government absorbs this loss of revenue to the first-pillar as an explicit subsidy.

An evaluation of each specific intervention, along with an overview of policies applied to increase social security coverage in developed economies, would form a core of "best practice" that currently does not exist.

VII. Conclusion

This paper provides a set of preliminary hypotheses to explain low rates of participation in reformed social security systems, with special emphasis on reforms in two Latin American countries, and their implications. The hypotheses claim that the working poor and self-employed continue to have a specific and strong rationale for avoiding participation in the multi-pillar pension system and that high transactions costs, systemic and design issues, and problems of credibility negatively influence the decision to participate on the part of all members in the labor force.

Some of the established hypotheses have been subjected to exploratory econometric testing using available household survey data for Chile and Argentina.

¹⁷ Workers earning the average wage in Uruguay can qualify for the contribution split.

While the available data do not allow all of the hypotheses that have been discussed to be tested, or an empirical discrimination among them, they support the conjecture that socioeconomic characteristics matter for (non) participation, and that the poor, the uneducated and the self-employed pose a special challenge to the extension of pensions coverage. In addition to a more social security-focussed survey, comparative analysis is required to confirm the results presented in this paper and to test those hypotheses related to the different pensions institutions reforming governments have chosen to put in place. Work in this vein has already begun.

An important underlying implication of the hypotheses presented is that rather than any fundamental flaw in the multi-pillar pension framework, reforms have not gone far enough toward making formal retirement security portable, flexible and inexpensive, and that there is still plenty of scope for a second wave of structural adjustments to reformed retirement security systems. While these reforms may not lead to full coverage of the labor force, they should ease the problem of inadequate retirement income for an important share of the population, reduce the scope and need for non-contributory assistance, and provide important social and economic benefits beyond income security in old-age.

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VIII. Annex 1: Empirical Analysis of Available Household Data from Chile and Argentina

In this Annex we: (i) describe the selected survey data from Chile and Argentina and discuss its limitations; (ii) and present the results of tests of as many of the hypotheses outlined in Section IV as the available data will permit.

A. Data Description and Data Limitations

From the array of household and labor surveys conducted in Chile and Argentina, we selected the 1996 CASEN and the 1997 EDS for our analysis.¹ These two surveys provide the latest available information in each country required for our investigation, namely: (i) data on participation in the government mandated pension system, and (ii) data on socioeconomic characteristics of individuals *and* households (education, occupation, and incomes) necessary to identify the factors that determine participation in formal social security.

Our empirical work was seriously constrained by limitations in the data. First, neither of the surveys that were chosen have pensions or social insurance as their primary or secondary focus. Rather, the surveys are intended to assess the accessibility, coverage and targeting of social assistance programs.² Second, and more importantly, the surveys are not uniform in breadth or depth, and thus the results cannot be compared. While the Chilean survey reports on the affiliation and contribution to social security of all individuals in the active labor force regardless of sector (private or public) and occupation status (employees, employer, self-employed), in Argentina *only* private sector employees are asked whether or not they contribute to a pension system (i.e., Whether contributions are deducted from their salaries for retirement schemes). Furthermore, in Chile the CASEN specifies to which regime (AFP, SSS, CAPREDENA, etc.) within the social security system a worker is affiliated and regularly contributes, while in Argentina the particular plan to which a worker contributes (AFJP, PAP) is not specified.

While the responses of the self employed in Chile reveal important information on the demand for public pensions and the motivations to contribute, the failure of the EDS (as well as of Argentina's *Encuesta Permanente de Hogares* - EPH) to question the self employed on their participation in government mandated social security is particularly surprising since the self employed are required to contribute in Argentina. This omission in the data from Argentina not only ignores a critical and frequently unprotected sector of the economy, but introduces a serious structural bias to our results.

B. Methodology and Results

We propose a simple methodology to test the hypotheses outlined in Section IV – the estimation of *probits* on participation in the formal pension system (defined via *regular contribution*). This method evaluates the significance, positive or negative influence, and impact that a number of explicative variables have on the probability that a specific event will be observed. For our purposes, the event is specified as contribution to the (AFP or any) pension system by individuals in their working age. While the available data allow differentiation between analysis of participation in the funded versus the PAYGO systems in Chile for which two probits are estimated, the dependent variable for our probit on Argentina is “contribution to a pension system”.

The main results are presented in Table A1 (Chile) and Table A2 (Argentina).

¹ Social Development Survey (Encuesta de Desarrollo Social), 1997 EDS and the National Socioeconomic Characterization Survey (Encuesta de Caracterizacion Socioeconomica Nacional), 1996 CASEN.

² Presidencia de la Nación Argentina 1998; MIDEPLAN 1998.

Table A1: Chile - Results from Probits on CASEN 1996 Data

DEPENDENT VARIABLE	CONTRIBUTION TO AFP			CONTRIBUTION TOWARD ANY PENSION SYSTEM			mean (x)
	Coefficient	z-value	Elasticity	Coefficient	z-value	Elasticity	
INDIVIDUAL CHARACTERISTICS							
Years of School	0.0031	2.25*	0.039	0.0069	4.88	0.076	7.35
Female Dummy	-0.05	-2.67	-0.043	-0.064	-3.37	-0.051	0.512
Marital Status							
Single	reference						
Married	0.221	11.01	0.214	0.276	13.72	0.239	0.568
Married Female Dummy	-0.561	-20.63	-0.271	-0.665	-23.85	-0.291	0.28
Age groups:							
15-29	reference						
30-39	0.109	6.44	0.04	0.15	8.6	0.049	0.218
40-49	-0.109	-5.37	-0.026	0.092	4.5	0.022	0.156
50-59	-0.384	-15.02	-0.073	-0.004	**0.17	-0.0007	0.112
60-65	-0.781	-16.58	-0.074	-0.241	-5.78	-0.021	0.056
65PLUS	-1.189	-17.32	-0.196	-0.602	-12.22	-0.09	0.097
HOUSEHOLD CHARACTERISTICS							
Number of children	-0.012	*2.1	-0.024	-0.03	-5.21	-0.056	1.2
Number of aged	0.05	4.12	0.04	0.028	*2.36	0.021	0.48
Santiago dummy	0.039	2.57	0.015	0.036	*2.26	0.012	0.233
Rural dummy	-0.056	-3.43	-0.025	-0.092	-5.48	-0.037	0.263
WELFARE VARIABLES							
Contributions to Health System							
Public system							
Fonasa categories A,B	reference						
Fonasa categories C,D	0.587	35.18	0.18	0.548	32.61	0.151	0.179
Private Systems							
ISAPRES	0.808	45.83	0.232	0.655	36.39	0.17	0.169
Other private systems	-0.48	-17.81	-0.098	-0.694	-24.62	-0.129	0.121
Private education household Dummy	-0.038	**1.69	-0.005	-0.017	**0.443	-0.0013	0.081
LABOR CHARACTERISTICS							
Labour Status (formality index)	0.443	123.55	1.719	0.484	114.15	1.711	2.29
Agricultural self employed dummy	-0.193	-4.99	-0.012	-0.074	*2.26	-0.004	0.038
Manufacture self employed Dummy	-0.763	-6.832	-0.013	-0.661	-6.39	-0.011	0.01
Service self employed dummy	0.216	*2.01		0.0008	**0.95	0.105	0.002
FINANCIAL VARIABLES							
Financial income household Dummy	-0.063	-4.27	-0.013	-0.034	*2.282	-0.004	0.532
Public Housing Credit Access Dummy	0.011	**0.02	0.001	0.097	3.71	0.01	0.07
CONSTANT	-2.136	-89.53		-2.15	-85.51		
Number of Observations	95337	26845.9 (23)		95337	24364.1(23)		
Wald Chi2 (n.d.freedom)							
Log-Likelihood	-23521.1			-22244.1			
Test on linearity of number of children:							
Chi2(1)	0.67			1.62			
Prob>Chi2	0.412			0.203			

* indicates variable is not significant at the 99% confidence, but is significant up to 95%

** indicates variable is significant at confidence levels lower than 95%

Wald statistic tests the significance of the model.

The null hypothesis on the test for linearity of "number of children", is the linear specification.

Table A2: Argentina - Results from Probits on EDS 1997 Data

DEPENDENT VARIABLE	CONTRIBUTIONS TO A PENSION SYSTEM			Mean (x)
	Coefficient	z-value	elasticity	
INDIVIDUAL CHARACTERISTICS				
Years of School	0.021	2.51	0.467	10.22
Female Dummy	-0.098	** -1.23	-0.107	0.492
Marital Status				
Single	Reference			
Married	0.974	8.62	0.309	0.141
Married Female Dummy	-1.019	-6.86	-0.018	0.081
Age groups:				
15-29	Reference			
30-39	0.648	3.95	0.042	0.029
40-49	1.239	8.54	0.061	0.022
50-59	0.861	6.1	0.058	0.03
60-65	0.633	3.04	0.011	0.009
65PLUS	-1.302	-4.66	-0.035	0.012
HOUSEHOLD CHARACTERISTICS				
Number of children	-0.139	-4.21	-0.291	0.93
Number of aged	0.136	*2.24	0.061	0.201
Buenos Aires dummy	0.061	**0.99	0.063	0.46
WELFARE VARIABLES				
Contributions to Health System Dummy	0.478	6.9	0.198	0.187
Private education household dummy	-0.034	** -0.391	-0.020	0.256
LABOR CHARACTERISTICS				
Labour Status (formality index)	0.365	25.59	0.892	1.115
Workers with secondary occupations other than waged, dummy	0.703	2.08	0.002	0.001
Self employed dummy	-3.002	-10.07	-0.262	0.039
FINANCIAL VARIABLES				
Financial income household dummy	n.a	-0.126	-0.029	0.105
Public Housing Credit Access dummy	* -1.33			
CONSTANT				
	-2.371	-22.34		
Number of Observations				
	14045			
Wald Chi2(n-d.freedom)				
	1276.7 (18)			
Log-Likelihood				
	-2645.7			
Pseudo-R2				
	0.438			
Test on linearity of number of children:				
Chi2(1)	0.61			
Prob>Chi2	0.435			

Annex 2: Overview of SRMS/PRIESO Questionnaire – Chile

In this Annex we provide an overall description of the Social Risk Management Survey – SRMS (in Spanish: *Encuesta de Prevision de Riesgos Sociales – PRIESO*) being piloted in Santiago, Chile in the Fall of 1999. The SRMS combines elements of labor, household, consumption and expenditure surveys and additionally will gather data on household awareness of the reformed pension system, preferences for alternative retirement security investments, financial literacy, access to credit, perceptions of mortality and contingent risk-coping strategies. The survey is intended to overcome the limitations of currently available household data, and has the following objectives and design:

(i) The SRMS is structured to identify and evaluate the strategies taken by individuals – and by groups of individuals in the household – in the face of a series of risks to income. The survey emphasizes those risks that affect the individual, and by extension his/her household. The questionnaire explores both institutional strategies as well as informal or traditional strategies taken by households in the face of income risks arising from the inability to work in old age, disability, work accident, and the death of income earning spouse.

(ii) The principal focus of the survey is on the Chilean Pension System, specifically on the motivations of working-age individuals when they decide to contribute or not to contribute to an individual retirement account. Following a set of introductory questions in Module I meant to identify characteristics of individuals and the composition of the household to which they belong, Module II of the SRMS, *Risk Recall and Perception*, constructs a history of past and present shocks to income and measures the expectation of future risks that can influence the decision to undertake risk-minimizing strategies. Module III, *Evaluation of the Pension System*, examines the knowledge and attitudes toward the pension system of both covered (contributing) and non-covered workers.

(iii) The remaining three modules seek to map the set of alternative strategies to participation in the formal social security system. These alternative strategies have been divided into three broad categories: *Financial Strategies* (Module IV), strategies that rely on *Intra and Inter Household* relationships (Module V), and finally, strategies related to the *Labor Market* (Module VI). The survey seeks to identify, evaluate and quantify: (i) the relevance of inter- and intra-household transfers to the decision to participate in the formal pension system; (ii) access to credit and personal savings – either complementary to or substitute for an AFP account; and (iii) variations in the household's supply of labor as a counter-cyclical risk-coping mechanism. At the end of Module V, a series of questions are asked to measure respondents' economic and financial awareness. These questions cover knowledge of basic economic indicators like the inflation rate and the rate of unemployment, as well as more sophisticated indicators such as the level of the stock market index. The data arising from these questions will allow researchers to test the extent to which economic and financial awareness differs between contributing and non-contributing workers.

(iv) The SRMS will be conducted on a sample of 2,500 respondents of working age (14 years and older) from the Santiago Metropolitan Area (including peripheral rural areas), drawn from the sample frame of the 1998 CASEN. Relative weights will be assigned to maintain statistical representation by labor market status (employed/unemployed), occupation (dependent worker/employer/self employed), sex (male/female) and location (urban/rural). The selection of the respondent in each household will be random, and unrelated to that individuals relation to the household head.

(v) The full questionnaire is available on the worldwide web at <http://www.worldbank.org/sp> and readers are encouraged to review the survey, in English or in Spanish, and to provide comments to the authors. First results are expected to become available in spring 2000.