Incentive Effects of Retirement Income Transfers

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Abstract

The paper explores the incentive effects of retirement income transfers – essentially, non-contributory cash transfers aimed at reducing poverty among the elderly. A literature review reveals how little academic analysis of the impact of these transfers has been completed. We begin with a taxonomy of retirement income transfers, differentiating between ex-ante and ex-post interventions and universal and targeted arrangements. This distinction allows important differences across designs to be highlighted. We then provide a simple framework for thinking about what the incentive impacts of the transfers might be, distinguishing between effects related to the transfer itself and those related to the financing mechanism. Thus, from theory and available empirical evidence we derive a few policy relevant findings. First, incentive effects will depend on the level of the transfer relative to average earnings and the degree of integration between the formal and informal sectors in the economy. In general, for modest transfers, negative impacts on savings and labor supply would be contained. Second, we highlight the tradeoff between maintaining low effective marginal tax rates (EMTRs) to reduce distortions and keeping the program costs at affordable levels. This tradeoff suggests that universal programs are suboptimal. Third, in terms of design features, we emphasize the importance of implementing a gradual withdrawal of the benefit to avoid crowding-out contributory pensions among low income individuals and of indexing the eligibility age with life expectancy to contain costs. Finally we find that matching contributions can be a promising instrument to promote savings among individuals with limited savings capacity.

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1. Introduction

All OECD countries, and many other nations around the world, have implemented some form of transfer to guarantee a minimum level of income during old-age. Most of the time these are transfers that take place after retirement -- often called "social pensions". But some countries are also starting to explore transfers that take place while individuals are active – so called matching contributions – to deliver a pre-funded social pension. Both types of programs can take a range of forms, and vary in the degree of integration with other policies directed to providing public support for the retired and elderly. But they have in common provision of cash, usually with some minimum level stipulated, to alleviate poverty among the elderly. Social pensions are offered primarily on a non-contributory basis.[1] It is this which makes them central to any effort to reduce the coverage gap in emerging economies, where the informal sector is large, and where access to standard social security is not available for much of the population. Matching contributions, on the other hand, are linked to individual contributions. While also serving the goal of guaranteeing a minimum level of income during old-age, matching contributions can also provide incentives for long-term savings, particularly for individuals with some but limited savings capacity who operate outside the formal sector.

Academic analysis of social pensions and matching contributions has been very limited. This may be due to lack of data, but the incentives to evaluate the programs are also lower given that they usually involve relatively small outlays compared with standard social security and other in-kind provision programs, such as health. If coverage of the financial risks and shortfalls faced by the elderly in emerging economies is to be substantially increased over any short period, however, then it is likely that retirement income transfers will become a more significant international policy paradigm, driven by the global demographic

[1] Note that this definition separates retirement income transfers, including social pensions, from standard social security, except insofar as social security might incorporate a "minimum pension", provided independently of contribution history. It also excludes public provision of services, such as long term care and health, which will likely be important to the elderly.

shift currently underway. As shown in Chapter 2, formal retirement income schemes are thought to cover fewer than 15% of the world's households and less than 10% of the world's working-age population (see also Holzmann et al. 2001 and Gillion et al. 2000). Most of those working without coverage live and work in developing countries (Willmore 2007). It is therefore timely to document what we do know about the impacts of retirement income transfers, and to consider what might be the most useful framework for further analysis.

In what follows, we begin with a taxonomy of retirement income transfers. This fills out the rather nebulous characterization offered above, and allows important differences across program designs to be highlighted. In Section 3 we then provide a simple framework for thinking about what the incentive impacts of social pensions might be. Section 4 offers a brief overview of the economic literature on the incentive impacts of retirement transfers, mostly focused on social pensions. While excellent reviews of the literature analyzing social assistance programs exist (for example, Atkinson and Micklewright 1991, Moffitt 1992), these do not cover retirement income programs, so even a brief review may be of use. Finally, in Section 5, we use a stochastic simulation model of the Egyptian pension system to illustrate the revenue requirements, and associated fiscal burden, of alternative social pension designs. Section 6 concludes.

2. Taxonomy of Retirement Income Transfers

As briefly mentioned above, we distinguish between transfers that take place after retirement age (ex-post transfers) and transfers that take place before retirement age (ex-ante transfers).[2] Section 4 will show that the two types of transfers can have different effects on individual behaviors. Thus, when analyzing how to secure a minimum level of income during old-age for different population groups, it is important to take an integrated approach and consider the cost and benefits of both interventions simultaneously.

Ex-post transfers are by far the most common. Four types can be readily observed: social assistance, targeted pensions, basic (universal) pensions and minimum pensions (Whitehouse 2005). Social assistance refers to general programs that also cover older people. Targeted pensions cover specific schemes

[2] For a discussion see also Robalino et al., 2008a.

for older people that are resource tested. Basic schemes are universal flat-rate programs which are non-contributory. Minimum pensions are a specification within a more standard social security scheme, which stipulates that qualified members will receive a minimum pension, sometimes conditioned on a certain contribution history.[3] They remain, however, a special case of targeted pensions where the test is based on the pension income generated by the contributory system (see below). Ex-ante interventions are more recent in the policy agenda of governments. These basically involve government matches to the contributions that individuals make to a given pension plan, which can be DB or DC, funded or unfunded. By design these transfers are resources tested.

In terms of targeted pensions it is possible to distinguish three types: those which are tested only against pension-income;[4] those which employ a broader definition of income for the test; and broader means-tested benefits, including, for example, assets.[5] However, means testing of this type is feasible only if the State can measure personal consumption at a modest incremental cost. This requires a bureaucracy capable of observing personal income and holdings of durable consumption goods. Under these two conditions, targeting allows both a reduction of the fiscal cost and stronger redistribution. These two conditions are also considered necessary for the implementation of matching contributions. Unfortunately, not all emerging economies have this type of institutional capacity (see Valdes-Prieto 2008). Even if good records are available for the "rich" who therefore can be excluded, it can be difficult to means-test the majority of the labor force

Other dimensions of differentiation within retirement income transfers can be readily identified, for example, the definition of the consumer (couple, family, or

[3] An alternative but related classification is offered by Willmore (2007). He divides what he calls "minimum pensions" into universal non-means tested pensions, residence based pensions, recovery pensions, and social assistance (page 27). In addition, in countries which do not hold adequate records of economic activity among its citizens, community based social assistance, which may simply represent some implicit or explicit risk sharing within a village or other local level jurisdiction, may be most effective in expanding coverage.

[4] Robalino et al. (2008a) shows that basic and minimum pensions can be characterized by the type of "claw-back." In the case of the classic minimum pension (top-up) the claw-back is set to 1 (there is a 100 percent marginal tax on additional pension income). In the case of the basic (universal pension) the claw-back is equal to zero.

[5] Other distinctions between means testing also exist – for example, many means tests exempt the family home, with impacts on household choice (Sane and Piggott 2008)

household), or eligibility conditions (residency, citizenship). But we believe the taxonomy presented above is operational and descriptive of the major social pension designs, and are categorized to allow accessible analysis of incentive effects.

Within the OECD, all countries have at least one of these types of pensions operating (see Chapter 6 and OECD 2005, page 23). The majority offers a targeted pension, and the next most common is the minimum pension. Social assistance and the basic pension are less frequently encountered. Only five countries rely on general social assistance programs as the only non-contributory program for the old. In middle and low income countries minimum pensions in the contributory system are also quite prevalent (see Chapter 1). Several countries have also adopted some form of "social pension" (see Chapters 4 and 5). Matching contributions are more recent initiatives with pilots taking place in the Dominican Republic (Law Passed), India (implemented in West Bengal), Mexico (implemented), and Vietnam (Law under consideration) (see Chapter 9).

3. Analyzing the incentive effects of social pensions: a conceptual framework

Like any other tax-financed financial transfer, retirement income transfers impact on incentives at two points in economic transactions: when the tax is levied, and when the transfer is received. In contrast to social security plans, where it may be argued that some dimensions of behavioral impact are neutralized through the actuarial link between contribution and benefit, social pensions are by definition redistributive, and the two points of price distortion need to be considered separately.[6]

To capture both points of intervention, however, it is necessary to adopt an economy-wide conceptual framework. Indeed, there are complex interactions between effective marginal tax rates facing those eligible to receive transfers, those not eligible, and those who are being taxed to finance it. The problem is also complicated by dynamic inter-temporal effects: the perspective of benefiting from a transfer during old-age might affect decisions about labor supply and savings during active life. So, individuals who would not be eligible for a transfer if the transfer program did not exist, would become eligible for a transfer because

[6] For a discussion of links between redistribution and incentives see also Robalino et al. 2008a.

the program is in place. In fact, even if the transfer is not targeted (i.e., there are no conditionalities of any type) and therefore generates a pure income effect, individuals might have incentives to change labor supply and savings rates over the life-cycle.

The usual place to start when assessing the incentive effects of retirement income transfers and social assistance programs in general, is to look at the marginal tax rates (EMTRs) facing potential beneficiaries. The story goes that targeted programs can induce large EMTRs and can reduce incentives to work and save for individuals close to the "eligibility line." Because efficiency costs, or excess burdens increase disproportionately with EMTRs, their estimation is a natural focus for analysis.[7] There are, however, potentially important tradeoffs between the EMTR, the number of people affected by the targeting, and other explicit taxes in the economy. We discuss these issues next.

Assume for the moment that we wish to compare a targeted with a universal social pension. First, while a means tested pension will impose high EMTRs on those at the margin of eligibility, where withdrawal of the pension is operative, many individuals potentially impacted by a universal pension will be unaffected by a targeted pension. The rate of withdrawal of the means tested pension, sometimes called the taper rate or claw-back, will impact on this. The lower the taper rate, the lower will be the EMTR, but the more people will be affected.[8] Second, as the taper rate (and the associated EMTR) is reduced, the overall revenue requirement of the program will increase, and this will require higher tax rates to be applied to others in the economy, probably workers. If they already pay high taxes, as in developed countries, then the same argument about disproportionate efficiency costs of high marginal tax rates will apply, offsetting the EMTR reduction among pension recipients. If the economy is less developed, with low tax rates, it is likely that the tax imposition will retard the development of the formal sector – or affect employment levels when programs are financed through pay-roll taxes (the common approach in the case of minimum pensions). Overall, the efficiency impact of the two designs will be a somewhat subtle trade-off between keeping a

[7] This idea is most readily captured as the "Harberger t square rule", which stipulates that under simple assumptions, the efficiency cost of a distortionary tax increases with the square of the tax rate.
[8] This point was first made by Blinder and Rosen (1985). Sefton (2008) makes the same point in the context of means tested pensions in the UK.

low EMTR for potential beneficiaries and keeping the tax-burden of the economy at affordable levels.

Figure 1 captures these effects graphically. The upper panel of the figure maps gross income, y_g (on the horizontal axis) into net income, y_n (vertical axis). M gives the level of minimum income available under the assistance scheme.[9] A 100% taper, that is, dollar for dollar withdrawal of the transfer with increments in gross income, is represented by the horizontal line MA. A 50% taper is represented by MA'. For an individual at any level y_g^* the cost of the pension is given by the vertical distance between the 45 degree line and the relevant disposable income line, MA or MA'. The fiscal cost of the program, however, will depend on the number of recipients, whose frequency is mapped in the lower panel. While the frequency distribution shown is illustrative, it is consistent with available evidence. The revenue cost increases dramatically as the taper rate is reduced, necessarily requiring increases in distortionary taxes elsewhere in the economy. Moreover, the income effect generated among those not affected by the claw-back can still change behaviors regarding labor supply, savings, and retirement.

The net impacts of these distortions on labor supply and savings are difficult to estimate and, as the next section will show, the empirical evidence to date is quite limited. Thus, to provide further insights, in the remainder of this section we go back to first principles and analyze potential incentives effects on labor supply using a life-cycle behavioral model.[10] General equilibrium effects resulting from the tradeoffs between the level of the EMTR and other explicit taxes are not considered here. Section 5, however, attempts to estimate the magnitude of this tradeoff and discusses potential implications.

In the life-cycle framework individuals are assumed to make decisions about how long and where to work, and how much to save, in order to maximize inter-temporal utility which depends on consumption. In the model used here, economic agents choose at each time t the savings rate, whether to retire or not,

[9] Depending on the nature of the scheme, this may be guaranteed to all, all above a certain age, or only to those enrolled in a social security program.
[10] The life cycle model of consumption smoothing may be less relevant in dealing with social pensions than for some other applications, but is nevertheless the most rigorous analytic framework available.

and the level of effort invested in keeping or finding formal sector jobs.[11] Thus the model can be used to understand trade-offs between formal sector work and unemployment, inactivity, or informal work. On the latter, the implicit assumption is that individuals have some degree of mobility between formal and informal sector jobs (and vice-versa); the labor market is not fully segmented. Transition probabilities between formal and informal jobs (including self-employment) then have two components: an exogenous component that does not depend on individual decisions, although it can be correlated with individual characteristics (e.g., formal firms that shut-down or downsize); and an endogenous component that depends on individual preferences and choices. In this setting, which seems to be an accurate description of the labor market in middle income countries like Chile, Brazil and Mexico (see for instance Bosh and Maloney 2007), the design of the transfer program would not only affect savings rates and retirement ages, but also the size of the formal sector relative to the informal sector. This may have a major impact on development if the informal sector uses less productive technology.[12] The formal-informal split, of course, would be less important or non-existent in countries where the labor market is segmented and the informal sector takes the form of a warehouse for residual labor.

We use the model to illustrate what would be the impact of various forms of retirement income transfers on contribution densities, average retirement ages, and program costs. Because choices depend on preferences for future and present consumption, attitudes towards risks, and views regarding formal vs informal sector jobs, we consider a large range of possible behavioral responses.[13]

[11] For a formal description of the model see Robalino et al. (2008a).
[12] Piggott and Whalley (2001) show that in a model with an informal sector and self supply, a broad-based value added tax may be less efficient than a tax on goods alone, if services can be provided either in the formal or informal sectors.
[13] The model dynamics depend on five main parameters: preferences regarding consumption and leisure, preferences regarding formal vs. informal work, attitudes towards risks, the rate of time preference, and the distributions of two exogenous shocks that affect movements in and out of the social security system (independently of individual decisions). The Brazilian yearly household survey was used to create a pseudo panel by age-cohorts and estimate the joint distribution of model parameters based on a generalized version of the Gibbs sampler. Different designs of the retirement income transfer are assessed "across" the joint distribution of model parameters (see Robalino et al. 2008a).

The main results from the analysis are summarized in Figure 2. Each panel graphs the change in contribution densities and retirement ages relative to the relevant counterfactual over various combinations of model parameters. There are three main insights. First, introducing a minimum pension in the form of a top-up (i.e., 100 percent EMTR) can induce important reductions in contribution densities and retirement ages, depending on the level of the transfer relative to average earnings.[14] For instance, in our simulations, a pension equivalent to 42 percent of an individual's earnings (the case of Brazil for the average worker) reduces contribution densities by up to 30 percentage points and the retirement age by up to 7 years (see first panel Figure 2). A more modest minimum pension equivalent to 25 percent of average earnings, on the other hand, reduces contribution densities by less than 10 percentage points and retirement ages by less than two years in most cases (see second panel of Figure 2). Retirement ages fall due to the income effect that makes early retirement more affordable. At the same time, the EMTR that is created by the top-up penalizes formal sector work: the individual can receive higher net earnings and enjoy a higher level of present consumption if working in the formal sector, but this reduces the level of the transfer, and therefore consumption, in the future. The rational response to this inter-temporal tradeoff is to participate less in the social security.[15]

A second insight is that a gradual claw-back of the minimum pension – in essence a reduction of the EMTR – can significantly increase contribution densities relative to the case of a 100 percent EMTR. The exceptions are cases where individuals have high inter-temporal substitution rates and strong preferences over leisure (see the third panel of Figure 2 where the numbers in parenthesis are the elasticity of utility relative to consumption and the rate of time preference). These individuals value future utility less and therefore care less about the level of the future transfer. They also value current consumption less and are willing to accept

[14] The baseline scenario assumes an earnings related pension system that pays a 3 percent rate of return on contributions (the equivalent of Notional Defined Contribution (NDC) system with individual accounts revalorized at 3 percent). Wages also grow at 3 percent per year and the interest rate on savings is 4 percent real. The minimum retirement age is 60 years.

[15] The effect is stronger among individuals with a low rate of time preference, meaning they discount future "utility" at a low and even negative rate (which various estimates from the literature suggest is the most frequent case). Individuals with strong preferences for consumption relative to leisure are also more affected. when retired, other things being equal, they prefer a higher level of consumption than an individual with strong preferences for leisure.

lower life-time earnings in exchange for more "flexibility" in work arrangements (i.e., by investing less efforts in finding and keeping formal sector jobs). In this case, the income effect of a lower EMTR induces lower participation in the social security. On the other hand, for individuals with stronger preferences for consumption over leisure and lower rates of time preference (the more common case) a claw-back of 30 percent increases contribution densities relative to the top-up by 1 to 12 percentage points. At the extreme, a flat transfer (i.e., a 0 percent EMTR) can increase contribution densities by 5 to 15 percentage points. Clearly, as previously discussed, a lower EMTR also increases the cost of the transfer. But the increase depends on the pre-retirement contribution density. For densities below 40 percent, the increase in costs is below 6 percent in the case of the flat pension and 3.8 percent in the case of the 30 percent claw back. For higher contribution densities the increase in the cost is much higher; for full career workers low EMTRs can increase the cost of the transfer dramatically (mainly because in the absence of a claw-back most individual would not be eligible for the minimum pension). In these cases, however, the claw-back would not be needed in the first place. Another result regarding the claw back is that the income effect of a lower EMTR can also reduce retirement ages in most cases (see fourth panel of Figure 2). If the system is well designed, however, lower retirement ages do not affect its financial sustainability.

The final insight is that matching contributions can have a significant positive effect on contribution densities. The fifth panel of Figure 2 shows the effect on contribution densities and retirement ages of a matching contribution program designed to cost, in present value, the equivalent of a flat pension equal to 42 percent of average earnings that is paid at age 60 after 40 years of contribution. The results show that for most combinations of model parameters contribution densities and retirement ages increase. For the contribution density the increase can be in the 1 to 30 percentage points range, in most cases between 5 and 10 percentage points. The result is not surprising: the more the individual contributes, the higher the level of the transfer. One would expect therefore that higher contribution densities would come at high costs. Similar to the case of the claw back, however, high costs are only associated with high pre-transfer contribution densities. For contribution densities below 60 percent, which would

be the most common case in middle and low income countries, the cost of the matching would be similar to that of the flat pension. Adding restrictions in terms of the maximum cap on transferred capital could bring costs down. But of course, this creates a positive EMTR on contributions that would also bring down the contribution density. There lies the tradeoff between lower distortions in labor markets and lower fiscal costs.

It is worth noting that, theoretically, a matching contribution can generate the same level of income protection during old age, at the same fiscal cost, but with less distortions on savings decisions than a social pension. This can be seen in Figure 3 which refers to a simple two period consumption optimization model. Each line in the figure gives the present value of utility as a function of consumption in period 1 – which given income determines consumption in period two. The left panel shows the effects of a social pension equal to 20 percent of average earnings (targeted to individuals with earnings below 30 percent) and combinations between the social pension and various levels of matching in a system based on a 10 percent contribution rate. We see that the social pension creates a "kink" in the utility function that makes it optimal to increase consumption in period one. Matching contributions on the other hand move the utility function up. A first observation is that matching contribution systems would be attractive; individuals would have incentives to enroll since they increase inter-temporal utility – even when a social pension is available. But the level of the matching is important. If the matching is too low (M=1) individuals will have incentives to enroll in the matching system and yet benefit from the social pension at the end by further reducing savings rates. In the first panel of Figure 3, it is only when M=3 that individuals can no longer "reach" the social pension (i.e., even with very low savings rate they would not be eligible). At M=3, however, the matching costs more than the social pension (0.3 of average earnings instead of 0.2). But these costs can be reduced by bringing down the ceiling for eligibility for the social pension. This is done in the right panel of Figure 3 where the ceiling is set to 20 percent of average earnings. There, a matching of two times the contribution rate (costs the same as the social pension) generates higher or similar levels of utility than the social pension but provides incentives for higher savings while young.

4. What do we know about the economic effects of social pensions? Five examples

As foreshadowed in the introduction, the literature on the incentive effects of social pensions is sparse. Partly this is because of the limited range of natural experiments that have presented themselves as candidates for empirical analysis. In what follows, we briefly review five studies. The first centers on the Supplemental Security Income scheme in the US, a sharply means tested instrument available to all age groups, but importantly used by the poor elderly not eligible for social security benefits. Aside from the specific findings on incentive impacts, this work also points up the importance of interactions between programs, an issue which policymakers do not always confront in designing a new policy instrument, or reforming an old one.[16] Next we turn to the Chilean system, a mandatory funded scheme with a minimum pension guarantee available after 20 years of contributions, and an underlying, but very modest, welfare payment plan. Our third focus of analysis is South Africa, where a means tested pension is available to, and taken up by, about 80% of the elderly, predominantly black. Here, the impacts of a pension on other members of a household is confronted, with surprising outcomes. The fourth case study is Brazil which has implemented a targeted social pension for the elderly poor as well as a universal rural pension. Finally, we turn to minimum pensions in Europe, focusing especially on Spain. Our review is not by any means comprehensive, but we hope it is representative and covers at least some of the important studies.[17]

It is worth emphasizing at the outset that identifying and quantifying the incentive effects of social pension programs is a more than usually challenging exercise, and results are usually to be treated with caution. The recipients of means tested benefits are, after all, meant to be different in germane ways from their non-pension recipient counterparts. As well, and especially in emerging economies, data reliability may be poor. As Case and Deaton (1998) put it:

[16] On program interactions see also World Bank (2008).

[17] Two important social pensions that we have not treated are those in Australia and the UK. The Australian means tested age pension has received only limited attention, but is analysed by Creedy and Kalb (2006), who in the context of a larger micro-simulation study of tax reform, analyse its labour supply impacts. The UK reformed its means tested pensions, changing the taper from 100% to 40%; Sefton et al (2008) use a dynamic programming approach to analyse the labour supply impacts of the change.

> "Simple correlations and regressions have a tendency to link pension receipt with undesirable outcomes, but these results can reasonably be attributed to the fact that pension recipients are different from others—in particular they are poorer and less well educated—or more subtly, to measurement error in income, so that even conditional on low measured income, the receipt of the pension may indicate low economic status." (1998, page 1360.)

The US Supplemental Security Income Program: Effects on Savings and Labour Supply.

The Supplemental Security Income Program is a means tested monthly stipend provided to aged (legally deemed to be 65 or older), blind, or disabled persons. It is paid by the federal government, but many states provide supplements to the federal benefit. The program is administered by the Social Security Administration. The program was created by the Nixon administration in 1974 to replace various state-administered programs which served the same purpose.

Currently, the federal payment stands at US$637 a month for a single person, or US$956 for a couple. The means test income limits may vary based on the state the individual lives in, his/her federal living arrangement, the number of people living in the residence, and the type of income. The resources limit is about $2000 for a single individual and $3000 for a married couple, in addition to an owner occupied residence and a motor vehicle. There were about 7.4 million beneficiaries as of March 2008, costing about 0.3% of GDP. Although administered by the Social Security Administration, the program is largely separate from Social Security. But it is a requirement that eligible recipients apply for social security before qualifying for SSI.[18] In 2007, 11.1% of Federal SSI payments were received by aged but not disabled individuals and 8.4% payments received by both aged and disabled individuals. Most payments were received by disabled individuals who were under 65 years old.[19]

[18] Our sources for information about the SSI provisions and payments include
http://www.ssa.gov/ssi/
http://www.ssa.gov/OACT/ssir/SSI07/index.html

[19] Annual report of the Social Security Supplementary Income, Social Security Administration 2008.

In two related studies, Neumark and Powers (1998, 2000) investigate the impact of the SSI on saving and pre-retirement labour supply, respectively. In the Saving study, they exploit state variations in SSI benefits to estimate the effects of SSI on saving, using data from the 1984 Survey of Income Program Participation. In order to derive their main result, they control for possible correlations between disability and income support by dropping individuals with any self-reporting work-impairing disability from their sample. By using the restricted sample, they are able to show that a $100 increase in annual benefits reduce saving by $281 among likely participants between ages 60 and 64. Their results suggest that a means tested retirement program can distort saving decisions of a portion of the population. They caution against applying their findings to social security systems more generally, because the SSI program serves a poor population with relatively low lifetime labor supply, Social Security, in general, serves a higher-income population with higher lifetime labor supply.

The later study focuses on pre-retirement labor supply. Using a similar empirical approach, they find evidence that generous SSI benefits reduce the pre-retirement labor supply (and earnings) of men who are likely to participate in SSI after retirement, as they near the eligibility age, especially men who are eligible for early Social Security benefits, which may be used to offset their reduced labor income. Their basic results show that generous SSI supplement reduces the probability of employment between ages 60 and 64 by 10%. The findings here are more robust, and secondary evidence suggests a causal relationship between the existence of SSI and labor supply behavior in this group.

The strongest effects are for those aged 62-64, who are able to take early social security entitlements. That is, the existence of SSI might encourage participation in another program at an earlier age than would otherwise be the case. This points to a subtle but extremely important feature in social pension design – that interactions with other programs may produce incentive effects not envisioned by policymakers concerned with the integrity of the social pension itself.[20]

[20] For a discussion of the interactions between social insurance programs and their effects on labor supply and savings see Robalino et al. (2008a).

The Chilean minimum pension guarantee and assistance pension: effects on informal sector work

The current Chilean pension system can be decomposed into three main pillars: a poverty prevention pillar, a contributory pillar and a voluntary pillar. The poverty prevention pillar, before the 2008 reform, was based on two components: a means-tested assistance pension [21] (the PASIS) and the Minimum Pension Guarantee (MPG) for individuals who contributed for at least 20 years to the individual capitalization scheme, but that were not able to finance a minimum amount for their retirement.[22] A recent study argues that the pre-reform non-contributory system contributed to reduce contribution densities; it provided incentives for informal Vs formal sector work (see Valdez 2008). First, among low income workers, the PASI provided incentives to contribute only to the point where the contributory pension surpasses 50 percent of the minimum pension. After this point, the PASI drops to zero; in essence a very large marginal tax to additional pension income. Similarly, the MPG provided incentives to contribute only to the point of eligibility (20 years). Additional contributions afterwards would have not increased the value of the total pension (contributory pension plus subsidy) paid by the contributory system. This implies a 100 percent marginal tax on additional pension income. This is a strong incentive to take informal sector jobs (despite the potential loss of productivity) in order to save mandatory contributions to the pension system and avoid paying implicit taxes on pension subsidies. Although, to date, there are no rigorous impact evaluations of this effect, general statistics suggest it was important. Thus, the coverage of the PASIS increased from 7.7 to 18.6 percent between 1992 and 2003, a period when the value of the MPG and the PASIS increased considerably relative to economy wide average earnings (see Valdez 2008). This suggests that a larger share of workers, including those who before considered that the transfer was too low, *chose* to maintain low contribution densities. The problem of low contribution densities in Chile where more than half of workers have contribution densities

[21] The requirements for the PASI are: (i) to be at least 65 years of age; (ii) not to have another pension; (iii) to have earnings that are below 50 percent of the minimum pension; and (iv) to have per capita family earnings that are below 50 percent of the minimum pension.

[22] For an analysis of the current system and the 2008 reform see Rofman et al. (2008). The authors indicate that as of March 2008, the minimum pension guarantee was equivalent to US$222 (US$242 after age 70 and $257 after age 75) and the PASIS program provided old age, disability or mental deficiency benefits equivalent to US$110 before age 70, US$117 after age 70 and US$128 after age 75.

below 50 percent is well documented in Berstein, Larrain and Pino (2006). In fact, a similar phenomenon is observed in Argentina and Uruguay (see Table 1).

The 2008 reform replaces these programs with a unique scheme that guarantees that all individuals in the 60% less affluent fraction of the population will have a guaranteed basic pension, regardless of their contribution history. This new program provides old age and disability subsidies, financed by general revenues of the State. Individuals with no contributions are entitled to an old-age Basic Solidarity Pension (PBS), once they reach 65 years of age, and fulfill the affluence and residence requirements. Individuals who make contributions can still receive part of the subsidy. Indeed, there is a claw-back based on the value of the contributory pension but which will be closer to 37 percent in the steady-state, as opposed to 100 percent today (see Valdez 2008). The resulting subsidy is called the Solidarity Complement (APS) and has the same affluence and residence requirements.[23]

Given the more gradual withdrawal of the subsidy, the reform is expected to improve incentives to contribute and therefore reduce incentives for informal sector work. Clearly, other things being equal, reducing the claw-back rate also increases the cost of the system, thus demanding higher fiscal revenues and higher explicit taxes (see discussion in Section 2). Some have therefore argued that there is an optimal claw-back rate where the marginal benefits of improved incentives to contribute equals the marginal costs of higher taxes. In the case of Chile this optimal claw-back would be around 20 percent (see Poblete, 2005).

Regardless of the claw-back rate, however, the problem that remains with the reformed system has to do with the level of the PBS which is expected to reach 82 percent of the median salary by year 2009! (see Valdez 2008). Thus, regardless of the progressive claw-back rate, the high PBS is very likely to reduce incentives for formal sector work.

The Brazilian rural pension: effects on labor supply and retirement decisions

The Brazilian national pension system is managed by the National Social Security Institute (INSS) and includes contributory and non-contributory arrangements.

[23] See Rofman et al. (2008) for a more detailed description of the reformed non-contributory system.

The contributory system for private sector workers offers old-age, disability and survivorship pensions (RGPS benefits). It is a defined benefit plan with pay-as-you-go financing. In addition, Brazil offers a means tested flat pension for the elderly poor (BPC) and an aging pension for agricultural workers. The latter offers a pension that can be a function of past earnings or equal to the minimum pension guarantee (*pisso providenciario*) which ever is higher. Most rural workers have short contribution histories and therefore retire with the minimum pension which today is equal to the minimum wage.[24]

A recent study exploited a reform implemented in 1991 to estimate the effect of the rural pension on retirement decisions and labor supply (see de Carvalho Filho, 2008). The reform in question reduced the minimum eligibility age for old-age benefits for rural workers from 65 to 60 for men and 55 for women; increased the minimum benefit paid to rural old-age beneficiaries from 50% to 100% of the minimum wage; and extended old-age benefits to rural workers who were not heads of households, thus expanding coverage to many married female rural workers. Because the minimum pension is not means tested and there are no conditions regarding contribution histories (no vesting period) it generates a pure income effect.

The author uses a triple differences-in-differences approach to identify the effect of the rural pension. The first difference involves a treated (rural workers) and control (urban workers not eligible for the rural pension) group. The second difference involves affected and unaffected workers within the treated group. Indeed, the 55-59 and 65-69 were, if anything, less affected by the reform than the age group 60-64. The results show a statistically significant increase of 25.40 percentage points in the benefit take-up rates of rural workers aged 60-64. Also, the proportion of rural workers aged 60-64 who "*did not work in the week of reference*" increased by 12.56 percentage points more than for urban workers of the same age (difference-indifferences), during the period immediately before and after the reform. This difference was not observed among the "unaffected" groups. Therefore, triple-differences estimates show a statistically significant increase of 10.96 and 6.03 percentage points in the proportion of rural workers

[24] For a recent assessment of redistribution and incentives in the Brazilian system see World Bank 2008.

aged 60-64 who "did not work in the week of reference", when the "unaffected group" is respectively males aged 55-59 and 65-69. In addition, "*total hours of work in all jobs*" for rural workers of the "affected age" decreased relatively to urban workers by 5.80 hours per week, during the period immediately before and after the reform. The triple-differences estimates show a relative reduction of 6.49 and 2.81 hours of work per week for rural workers aged 60-64 relatively to the 55-59 and 65-69 age groups respectively (only the former is statistically significant).

The author argues therefore that estimates of the poverty reduction effect of old-age benefits in developing countries should take into account the negative labor supply impact of those benefits. The author also sustains that the finding of a sizeable pure income effect suggests that means testing is more desirable than otherwise, since one important cost of means testing is its negative labor supply consequences. The paper also showed that more educated workers are better able to benefit from social programs than less educated ones, perhaps because either they are more able to understand the formal rules of the game, or they are in general better informed.

South Africa's means tested age pension: effects on labor supply and job seeking efforts

The South Africa social pension has been in existence since 1928, although much analysis focuses on the period after 1993, when it was reformed. It is available to women aged 60 or more, and men from 65.In practice it pays the maximum each month (820 Rands in 2007, about USD105) to anyone without a private pension (Ardlington et al. 2007). The social pension is about twice the median per capita African income, or about 20% of GDP per capita, and thus a very important income source for many Africans. Altogether, there were more than 2 million households with pension beneficiaries in 2007. The IMF estimated South Africa's GDP per capita as US$ 5906 (approximately US$492 per month) in 2007. Its cost was estimated at 1.4% of GDP in 2006.[25]

[25] Sources for this paragraph include:
http://www.helpage.org/Researchandpolicy/PensionWatch/SouthAfrica
http://www.dsd.gov.za/dynamic/dynamicXML.aspx?pageid=472

The program has received a good deal of academic attention, perhaps because of its importance as a potential model for the developing world. The most recent and comprehensive study is that of Ardlington et al (2007), who focus on the implications of pension receipt for the whole household, assuming some form of income sharing. Standard analysis assumes households pool income, so that labor supplied by prime age workers is reduced as a result of social pensions. Alternatively, however, as the authors put it:

> "if social transfers allow households to overcome credit constraints, enabling households to bankroll potential migrants or potential work seekers who need financial support to look for jobs, then social transfers like the pension may promote employment and help households to break out of poverty traps." (page 2).

Early studies suggested that the pension had the expected impact of reducing labor supply (Bertrand et al 2003). But later research pointed to an interesting interaction between household receipt of an age pension and the probability that a younger member of the household might migrate to find work. While the standard result held for workers *resident* in the household, the ability of households receiving a pension to help its younger members find work elsewhere offset this result (Ardlington et al 2007).. This effect appears to operate both through simply credit constraint relief, and through freeing older household members from work so that children might be cared for, thus providing the opportunity for more productive younger workers to seek employment.

This finding expands the range of potential impacts of the social pension in developing countries where coverage rates are low. It suggests that, at least in developing countries, the role of the social pension might be much more varied than economists and policymakers have supposed, and that these potential impacts should be assessed when such policies are being considered.

<u>The minimum pension in Spain: effects on retirement and savings decisions.</u>

Minimum pensions which are part of the national contributory system are quite prevalent in Europe (see Chapter 3). Recent evaluations have shown that current systems have deficiencies of various kinds when compared with the particular standard set by the EMP and that the effects are highly uneven across countries (see Atkinson et al., 2002). Much attention has been given to the analysis of the

effects on retirement decision through different approaches. Important among these are the study of implicit incentives (Gruber and Wise, 1999; Blöndal and Scarpetta, 1998); reduced-form models of retirement (Samwick,1998); and models of conditional consumer decisions in a given economic environment (Stock and Wise,1991; Rust, 1997; and Boldrin et al., 2004). In the remainder of this section we focus on the minimum pension in Spain analyzed in Jiménez-Martín and Sánchez-Martín (2006 and 2007). The authors quantitatively assess the impact of the Spanish pension rules, especially the minimum pension scheme, on the retirement and savings patterns of Spanish workers.[26]

The public Spanish pension system (old-age, survivorship, disability) has two components. The first component is a compulsory state pension system, universal and financed by taxes, which guarantees a minimum source of income to all individuals. The second component is a defined benefit plan financed by contributions on pay-as-you-go (PAYGO) basis. The crucial element for redistribution and solidarity is the minimum pension. During the late 1970s and early 1980s, close to 70% of the Spanish pensioners received a minimum pension; in 2001 this percentage was still a very sizeable 32% of the stock of pensioners, with about 25% of new recipients starting out with a minimum pension. The minimum pension has been growing faster than the minimum wage and since year 2000 the minimum pension is higher than the minimum wage. Data on retirement patterns suggest that this minimum pension is far from being neutral (in a labor supply sense), since it increases retirement probabilities for an important fraction of workers, especially low income workers, which are potentially affected by the minimum pension.

The authors show that the minimum pension increases the opportunity cost of the forgone pension income and utterly eliminates the incentive to work due to the early retirement penalties. These two effects make it optimal for most low-income workers to retire at the earliest possible age (i.e., the ERA). This *substitution effect* is accompanied by an *income effect* as the minimum pension effectively increases individuals' life cycle wealth. This income effect also

[26] This task is undertaken with the help of a life cycle model with an endogenous retirement decision and the prohibition to borrow from future pension income. This model is used as the data generating process in an structural maximum likelihood estimation, carried out over a unique, very large sample of labor records obtained from the Spanish Social Security administration (HLSS).

weakens the incentive to keep working in pre-retirement ages. These findings are reminiscent of Neumark and Powers (1998, 2000) findings on SSI. The net effect is a change in the shape of the retirement distribution in a fundamental way, shifting substantial amounts of probability mass from 65 and the immediately preceding early retirement ages (between 61 and 64) to the ERA of 60 (see Figure 4). As minimum pensions carry the retirement age of large groups of individuals forward, the distribution changes from a uni-modal shape (with a single peak at 65) to a bi-modal one (with peaks at both 60 and 65). A remarkable spike emerges at the age of 60, as the probability of retiring exactly at the ERA almost triples (6.6% in E1 vs. 18.0 % in E3). Increases in the incidence of pre-retirement are mirrored by decreases in retirement after the ERA. Early retirement before 65 experiences a 15.5% reduction, while retirement at the NRA goes down by 30%. Overall, the introduction of the minimum pension implies a 10% increase in the occurrence of early and pre- retirement. All in all, the introduction of minimum pensions (together with the other caps and ceilings) reduces the average retirement age by four months, from 63.0 to 62.66 years. Most changes occur at the lowest end of the income distribution.

The authors also show that the minimum pension has effects on individual saving behaviors. The wealth effects implied by the guaranteed minimum can be quite substantial, leading to an upward shift in the life-cycle profile of consumption. This in turn implies lower savings at the first stages of the life cycle and lower accumulated assets (see Figure 5).

But do these behavioral changes have meaningful effects on welfare? The authors also attempt to estimate the welfare loss/gain resulting from the *redistributive function* of the minimum pension.[27] On one side, the minimum pension benefits low income workers; on the other, it imposes higher contributions rates on the overall population. The question is then, how much "extra" life-cycle consumption one would need to give to each individual in the sample to make him/her indifferent to the simultaneous (i) elimination of the minimum pension;

[27] See Jiménez-Martín and Sánchez-Martín (2006 and 2007). The welfare effect is assessed by computing a compensated equivalent variation that keeps constant the average generosity of the system (in terms of its implicit internal rate of return). See Appendix for a formal description of the methodology.

and (ii) reduction in the contribution rate.[28] The results show that the welfare impact of the minimum pension is quite modest; a 0.6% increase in the life-cycle consumption of the median worker in the economy. This low figure is, of course, the result of the cancelation of effects of opposite sign for different individuals. The *gain* for a low income worker that retires at the age of 60 is a substantial 3.3% of his/her life-cycle consumption. For a worker of average earnings that stays active until age 65 the *losses* from higher contributions amount to almost 1% of his/her life-cycle consumption. It is important to note, however, that these figures are extremely sensitive to changes in the growth rate of the minimum pensions. Also, the economic costs resulting from a reduction in labor supply as a result of early retirement are ignored.

The authors argue that these findings make it clear that minimum pensions should receive more attention in the current debate about the reform of the pension system in Spain (or any country with a similar system). Indeed, it makes little sense to discuss changes aimed at fostering older workers' labor participation and, at the same time, to ignore the strong disincentive effects of minimum pensions.

5. The fiscal cost of retirement income transfers

As discussed in Section 2, beyond the potential impacts of retirement income transfers on savings and labor supply, one of the main sources of distortion is the cost of the transfer itself. This needs to be financed out of general revenues through some form of tax.[29] In the case of minimum pensions offered within contributory systems the financing mechanism usually involves payroll taxes and employee contributions which increase the tax-wedge and can reduce the level of formal employment. Evidence at the international level, for instance, suggests that a 1 percentage point increase in the tax-wedge can be associated with a 0.4 percentage point reduction in the level of employment (see World Bank 2008). In this section we use the Egyptian case to illustrate the tradeoff between a lower EMTR (which presumably reduces distortions in labor markets and provides better incentives to contribute) and higher fiscal costs. We also look at the fiscal impact of the eligibility age.

[28] In the calculations the contribution rate is reduced so that the average internal rate of return paid by the system remains unchanged after eliminating the minimum pension.
[29] Chapter xx discusses some of the issues related to the financing of social pensions.

Egypt is an interesting case because the country is in the process of reforming its pension system; a classic defined benefit plan financed on a pay-as-you-go basis that includes a quasi non-contributory scheme to cover casual workers (see World Bank 2005).[30] Under current arrangements, eligible casual workers contribute 1 pound per month and receive upon retirement a flat pension equal to 80 pounds per month (around USD 8). The contributory system also offers a minimum pension guarantee to plan members estimated at around 20 percent of economy wide average earnings. Under the reform, these two programs are integrated under a new scheme that is reminiscent of the recent Chilean reform (see Section 4). In essence, all individuals aged 65 or more (the eligibility age is automatically indexed with life expectancy) become eligible for a basic pension (set at 15 percent of economy wide average earnings). This basic pension, however, is reduced as a function of the contributory pension which in the reformed system comes from notional and funded individual accounts.[31] Thus, individuals who never contribute to the public pension system get the basic pension in full. Those who contribute can get part of it depending on their contribution density and level of income.

To evaluate the cost of the program under various designs we use a stochastic simulation model designed for Egypt that takes into account transitions in and out of the social security.[32] The results show that, as presented in the Draft Law, the cost of the new system would start at around 0.7 percent of GDP, increase gradually over the next 30 years as a result of population aging, but then stabilize below 1 percent of GDP (see Figure 6). The dynamics of these costs, however, are quite sensitive to both the taper rate and the indexation of the eligibility age. Without the automatic indexation of the eligibility age costs would almost double, reaching xx percent of GDP by the end of the simulation period. Indexing the

[30] A new Draft Social Security Law has been prepared and it is expected to be submitted to the parliament before the end of the calendar year.
[31] The contribution rate to the NDC and FDC portions are 15 and 5 percent respectively.
[32] The model decomposes the labor force into various occupations including civil servants, self-employed, wage earners in the formal sector, and informal wage earners. Within each category workers are divided by age, gender, and level of income. Costs are estimated for each subgroup separately and then aggregated. Members of each occupational category face different transition probabilities to move in and out of the social security. For a detailed description of the model see Di Filippo and Robalino (forthcoming).

eligibility age thus becomes one of the most important instruments to neutralize the cost of the program on population aging.

The claw-back rate has also important fiscal implications. With a zero percent claw-back, basically the case of a universal pension that would impose the lowest distortion in the labor market, the cost of the program relative to the non-indexation case could increase by 0.5 percentage point by the end of the simulation period. At the other extreme, imposing a 100 percent claw-back rate would reduce the cost of the program by 1 percentage points over the long term relative to the no claw-back case. Thus, going from a 100 percent to a 30 percent claw-back rate demands around 0.7 percent of GDP in additional fiscal revenues. As discussed in Chapter 7 mobilizing these resources can be an important challenge for many middle and low income countries.

This raises the issue of having a broader targeting mechanism – albeit with a gradual taper rate. The cost and benefits of targeting systems are discussed in Chapter xx. As a preamble, however, it is worth emphasizing that the savings from a good targeting system can be considerable. A recent study in countries in the Middle East and North Africa region, for instance, shows that perfect targeting (only the elderly poor are eligible) can cost between 2.3 and 24 times less than a universal pension (see Robalino et al. 2008b).

6. Conclusions

This paper has discussed the potential distortions of retirement income transfers, focusing on labor market effects, savings decisions, and the fiscal costs of the programs. The analysis has been constrained by the small number of rigorous impact evaluations of the various programs. Nonetheless, from theory, simulations, and five case studies a few general findings with important policy implications can be derived.

First, by and large, economic distortions taking place at the point where the benefit is paid and/or the point where the tax is levied will depend on the size of the transfer. A transfer that represents 15 percent of economy wide average earnings (Egypt) is likely to have fewer impacts on behaviors and demand, other

things being equal, a lower level of taxation than a transfer that represents 42 percent of economy wide average earnings (Brazil). A transfer that is close to or equal to the minimum wage might also have more important effects on work incentives.

Second, there is an unavoidable tradeoff between trying to contain distortions in the labor market by keeping low EMTRs, the number of people receiving transfers, and the cost of the program, which determines the need for other, explicit, distortionary taxes. This suggests the existence of an "optimal" EMTR schedule. While in practice trying to identify this optimum can be an elusive task, one can at least be confident that it is unlikely to involve zero targeting. Thus, a "targeted" transfer would be a superior option to a universal transfer. The choice of income base for the test is another policy question and similar arguments would indicate that a broader measure of income may be better than only pension income.

Third, beyond the effect that retirement income transfers can have on the supply of labor, there can be effects on the choice between formal and informal sector work. As discussed in the case of Chile, the claw-back rate (and the level of the benefit) can influence contribution densities and therefore the size of the effective coverage of the contributory system. Policymakers should avoid design where the total pension (contributory plus non-contributory) paid by the public system does not increase as a function of contributions or where the transfer abruptly drops to zero after a certain level of income. Consistent with the previous message, EMRTs below 100 percent should be preferred.

Fourth, there is strong evidence that the income effect from the retirement transfers influences decisions about retirement. The case studies of Brazil and Spain showed that by raising the opportunity cost of waiting to retire, retirement income transfers can induce more early retirement. The eligibility age for the transfer therefore becomes a key policy variable. This variable, along with the level of the transfer, will have the highest impact on the cost of the program. A critical feature of a sustainable design is thus to index the eligibility age with changes in life expectancy.

Fifth, the pure labor supply effects (hours worked) of retirement income transfers are more controversial. The Brazil and US case studies showed that transfers can reduce labor supply particularly in the ages close to retirement. In Brazil, the reduction in labor supply takes place even if the program does not have "strings attached" (i.e., there is a pure income effect). The South Africa case showed, however, that there are also indirect effects that need to be taken into account. While the social pension there does reduce labor supply among the eligible population, it also facilitates job search efforts among other prime age household members. Overall, labor supply in that case can increase.

Sixth, when it comes to savings, the evidence in US suggests that retirement income transfers can reduce saving rates. The analysis of the Spanish minimum pension and the simulations presented in Section 3 also point in this direction and predict non-trivial effects. Overall, however, the effect will depend on the level of the transfer relative to average earnings. Modest transfers that focus on low income population groups that have a low savings capacity to start with, are likely to have very limited macroeconomic effects.

Seventh, although still in "experimental design," matching contributions appear as a promising instrument to ensure a minimum level of income during old-age and also stimulate compliance and reduce informality. Other things being equal, our simulations in Section 2 suggest that matching contributions can provide better incentives to enroll and contribute among population groups with some savings capacity relative to minimum pension guarantees – except if these are conditioned on contribution densities, in which case they would be similar. Matching contributions cannot be a substitute for non-contributory pensions, but could be an important complement, particularly to provide incentives to enroll and contribute to individuals with limited savings capacity. The results even suggest that matching contributions could replace minimum pension guarantees in the contributory system. As with the Chilean and Egyptian public pension systems, individuals who contribute would lose *part* of the flat subsidy that is provided in the absence of contributions. Still, a higher expected pension (the sum of the contributory and non-contributory portions) would provide incentives to

contribute. Individuals could save elsewhere without matching and still preserve part of the subsidy. The matching contribution, however, would provide an additional incentive to save and also improve compliance.

A final remark is that the design and implementation of retirement income transfers needs careful analysis and adequate planning and evaluation. It is especially important that the potential impacts of interactions with other programs be considered. Given the set of uncertainties that surround an ex-ante evaluation of economic and social impacts, it would be desirable that the implementation of a new program proceeds gradually. Countries could start with small pilots that would be expanded only after a rigorous evaluation.

References:

Ardington, C., Case A. and Hosegood V. (2007), "Labor Supply Responses to Large Social Transfers: Longitudinal Evidence from South Africa", *Working Paper 13442*, NBER, Cambridge

Atkinson T., Bourguignon F, O'Donoghue C., Sutherland H. and Utili F. (2002), "Microsimulation of Social Policy in the European Union: Case Study of a European Minimum Pension", *Economica*, New Series, 69, 274, May, 229-243

Berstein, Solange; Larrain, Guillermo and Pino, Ariel (2006), "Chilean Pension Reform: Coverage Facts and Policy Alternatives", Economia 6(2), 227-279

Bertrand, Marianne, Sendhil Mullainathan and Douglas Miller. 2003. "Public Policy and Extended Families: Evidence from Pensions in South Africa." *The World Bank Economic Review* 17(1): 27-50.

Blondäl, S. and S. Scarpetta (1998), "The retirement decision in OECD countries", OECD Economics Department, WP 20.

Boldrin M, Jiménez-Martín M, Peracchi F. 2004. Micromodeling of social security and retirement in Spain. In *Social Security and Retirement around the world: micro-estimation*, Jonathan Gruber and David Wise (eds). University of Chicago Press for the NBER: Chicago.

Bosh Mariano and William Maloney. 2007. "Comparative Analysis of Labor Market Dynamics Using Markov Processes: An Application to Informality." IZA Discussion Paper Series. IZA DP No. 3038.

Carvalho, Irineu E. 2002: "Old-Age Benefits and Retirement Decisions of Rural Elderly in Brazil" mimeo, Department of Economics, Massachusetts Institute of Technology, Cambridge, MA, November 15, 2002.

Case, Anne and Angus Deaton. 1998. "Large Cash Transfers to the Elderly in SouthAfrica." *Economic Journal* 108(450): 1330-1261.

Creedy, John and Guyonne Kalb (2006), *Labour Supply and Microsimulation: The Evaluation of Tax Policy Reforms,* Edward Elgar.

Blinder, Alan and Harvey Rosen (1985), "Notches", *American Economic Review*, 75, 4, September, 736-47

Gruber J, Wise D (eds). 1999. *Social Security and Retirement around the World*. University of Chicago Press: Chicago.

Jiménez-Martin S., and Sánchez-Martín AR. (2006), "An Evaluation of the Life-cycle effects of minimum pension on retirement behavior: Extended version", Forthcoming in *Journal of Applied Econometrics*.

Jiménez-Martín S, Sánchez-Martín AR. (2007). "An evaluation of the life-cycle effects of minimum pensions on retirement behaviour", *Journal of Applied Econometrics*, 22, 923-950.

Mirrlees, J. (1971) "An exploration in the theory of optimum income taxation", *Review of Economic Studies*, 38, 175-208.

Moffitt, Robert. 1992. "Incentive Effects of the U.S. Welfare System: A Review,"*Journal of Economic Literature* 30(1): 1-61.

Piggott, John and John Whalley (2001), "VAT Base Broadening, the Informal Sector, and Self Supply", American Economic Review, 91, 4, 1084-1094, September.

Neumark D., and Powers E., 2000, "Welfare for the elderly: the effects of SSI on pre-retirement labor supply", *Journal Public Economics* 78, 51-80

Posel, Dorrit, James A. Fairburn and Frances Lund. 2006. "Labour Migration and Households: A Reconsideration of the Effects of the Social Pension on Labour Supply in South Africa." *Economic Modelling* 23: 836-853.

Poblete, Dante (2005) "Grado de Focalización Óptimo de las Pensiones No Contributivas en el Tercer Mundo", Tesis de Economía, Instituto de Economía PUC, 1er semestre.

Robalino David. 2008. "Labor Markets In Latin America: Structure, Dynamics and Implications for the Design of Social Protection Policies. Draft Manuscript. World Bank. Washington DC.

Robalino David, Eduardo Zylberstajn, Helio Zylberstajn, and Luis Eduardo Afonso. 2008a. "An Ex-Ante Evaluation of the Impact of Social Insurance Policies on Labor Supply in Brazil: The Case for Explicit over Implicit Redistribution." Forthcoming. Social Protection Discussion Papers. World Bank. Washington DC.

Robalino David, Gudivada Venkateswara Rao and Oleksiy Sluchinsky. 2008b. Preventing Poverty Among the Elderly in MENA Countries: Role and Optimal Design of Old-Age Subsides. Forthcoming in Pensions Primer Series. World Bank. Washington DC.

Rofman Rafael, Eduardo Fajnzylber and German Herrera. 2008. "Reforming the pension reforms: The recent initiatives and actions on pensions in Argentina and Chile." Primer Pensions Series. World Bank. Washington DC.

Rust J, Phelan C. 1997. How social security and medicare affect retirement behavior in a world of incomplete markets. *Econometrica* 65: 781-831.

Samwick A. 1998. New evidence on pensions, social security and the timing of retirement. *Journal of Public Economics* 70: 207-236.

Sane, Renuka and John Piggott, 2008. "Does the Owner-Occupier Exemption from the Pensions Means Test Affect Housing Choice of the Elderly? Evidence from Australia" SSRN: http://ssrn.com/abstract=1276854

Sefton, James, Justin van de Ven and Martin Weale (2008), "Means Testing Retirement Benefits: Fostering Equity or Discouraging Savings", *Economic Journal*, 118, April, 556-590.

Valdez Prieto Salvador. 2007. "Pensión Solidaria: evaluación económica y política." Unpublished Manuscript. Santiago de Chile.

Whitehouse, Edward (2005), *Pensions at a Glance,* OECD, Paris.

Willmore Larry, 2007, "Universal Pension for Developing Countries", *World Development,* 35, 1, 24-51.

World Bank 2006. "Egypt: Improving The Welfare Of Future Generations Through Pension Reform." Report. Middle East and North Africa Region. Human Development Department. World Bank. Washington DC.

World Bank. 2008. "Brazil: Social Insurance And Labor Supply: Assessing Incentives And Redistribution". Draft Technical Report. World Bank. Washington DC.

Figure 1: Means tested transfers

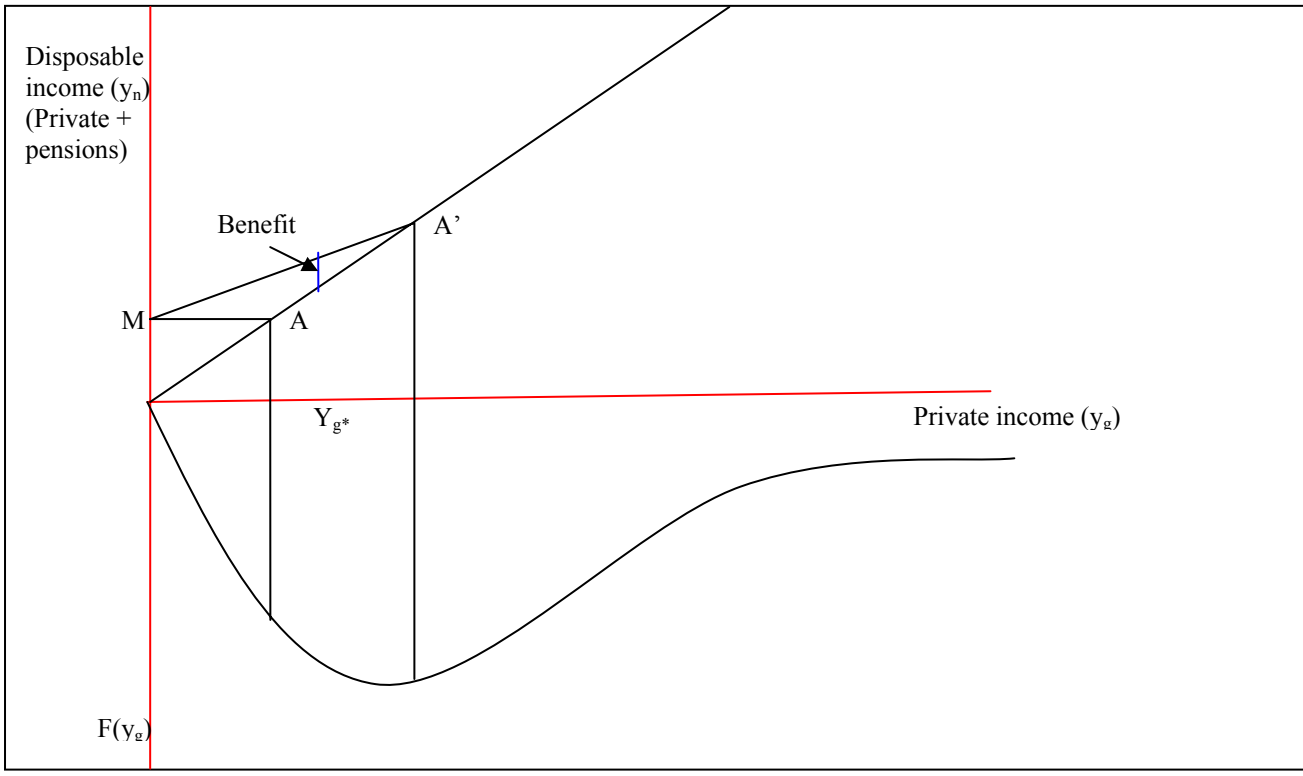

Figure 2: Effects of Transfers on Contribution Densities and Average Retirement Ages

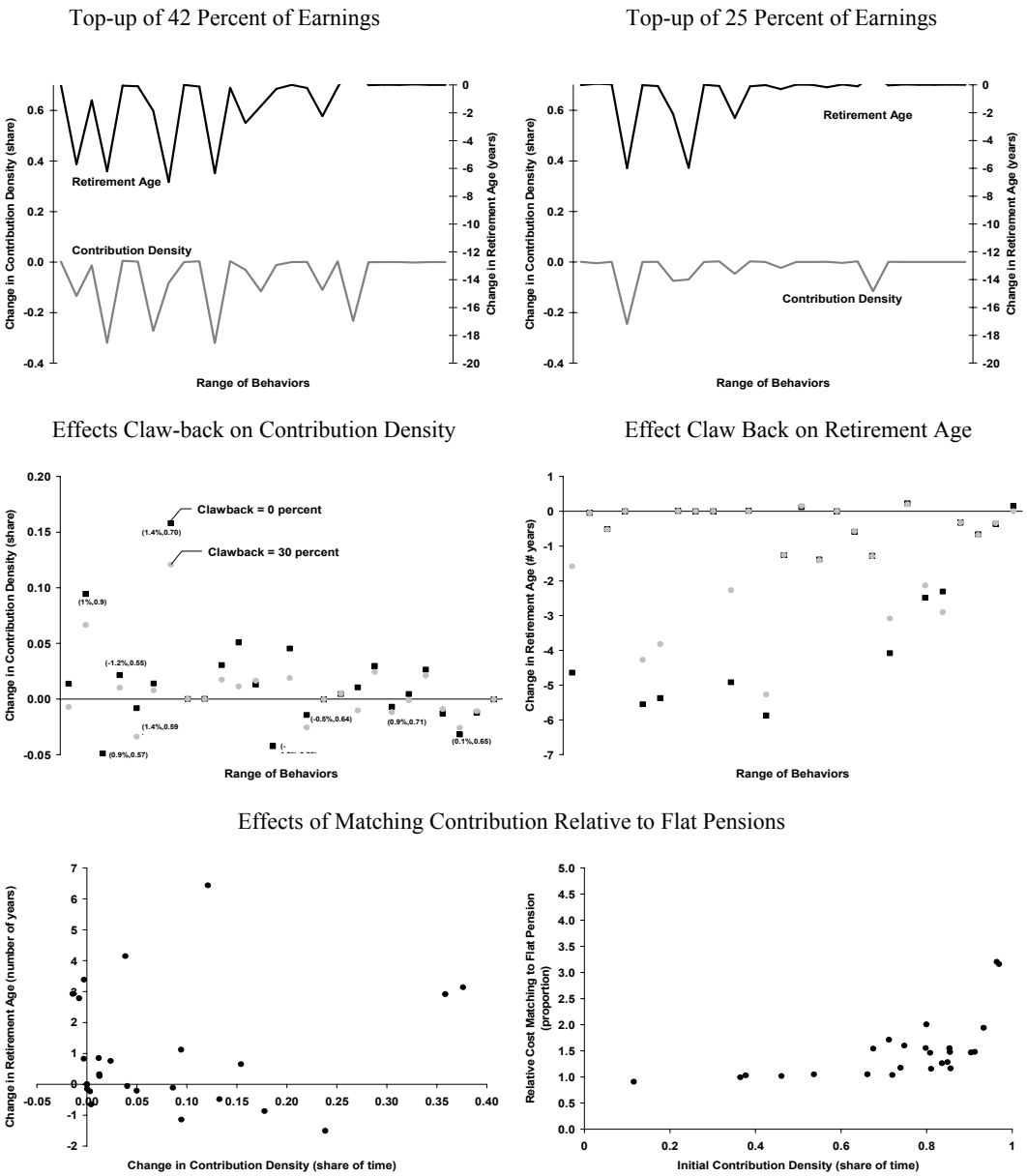

Figure 3: Matching Contributions and Social Pensions

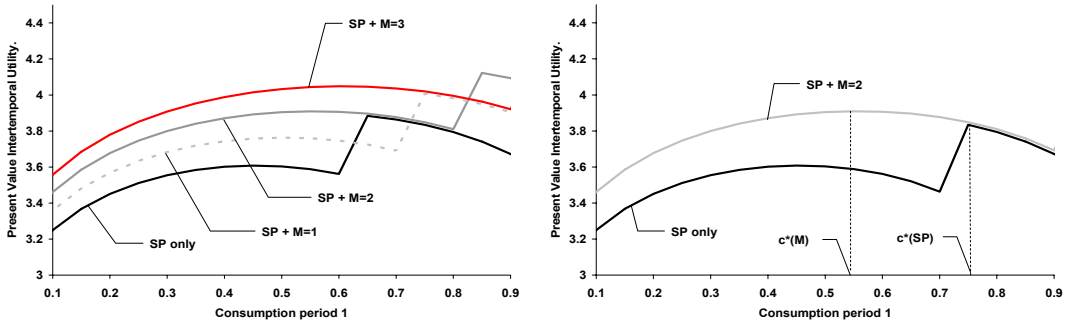

Figure 4. Simulated aggregate retirement probabilities by age in the economies with and without the minimum pension scheme.

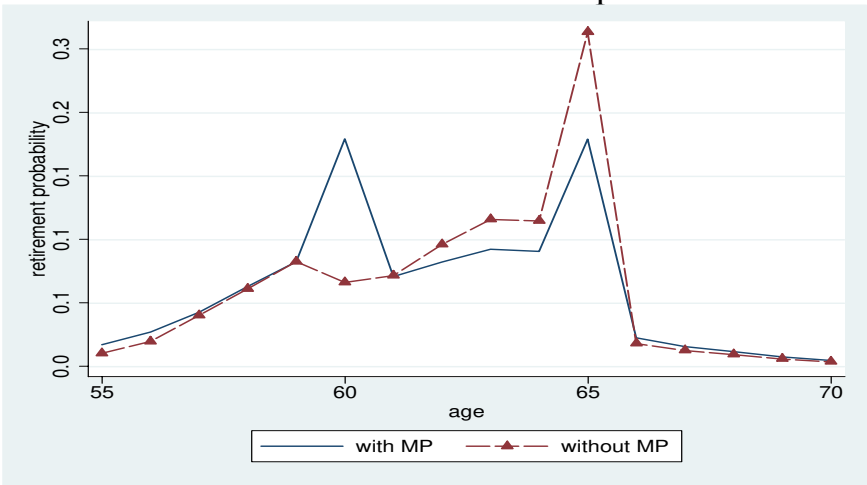

Figure 5. The impact of minimum pension regulation on consumption, income, savings and assets.

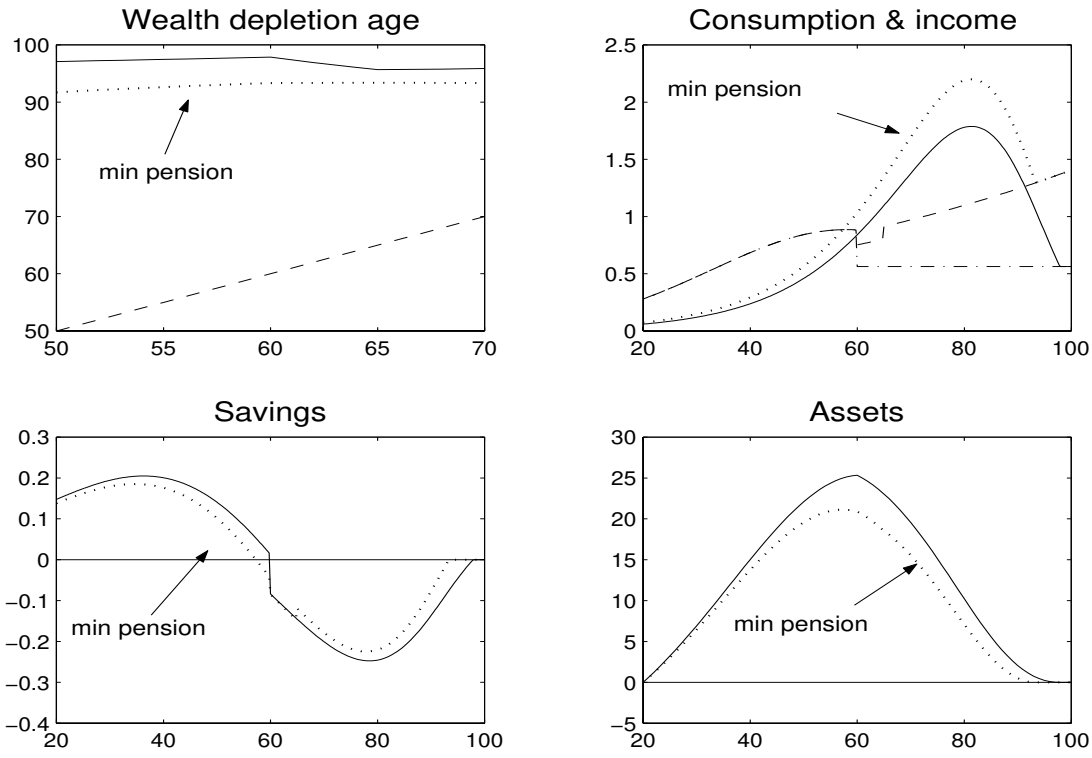

Figure 6: Fiscal Cost of Alternative Retirement Income Transfers in Egypt

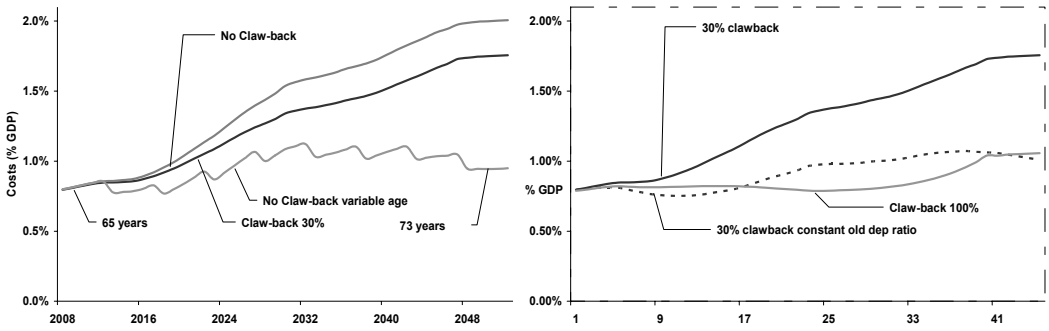

Table 1: Contribution Densities in Chile, Argentina, and Uruguay

	Argentina		**Chile**		**Uruguay**	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*Median*
Total	55	56.7	47.2	47.4	58.4	61
Sex						
Men	56.9	61.2	53	55.4	59.6	63
Women	55	55.6	39.7	35.7	57	58.1
Income bracket						
Poorest quintile	44.1	36.9	28.6	21.9	42.9	31.4
2nd quintile	51.4	48	43	40.9	55.9	54.8
3rd quintile	54.5	54.5	48.7	50.3	60.3	62.9
4th quintile	58.6	65.6	56.4	59.7	64.4	71.4
Richest quintile	67.7	88.9	60.5	65.6	68.5	85.7
Age						
20	34.7	20	44.9	45.1	49	47.6
35	69.2	83.3	51.9	54.2	69.6	86.7
50	68	85	42.3	48.6	71.6	92.4

Source: Robalino 2008.

Appendix. Assessing the Welfare impact of a Minimum Pension Scheme

Low income workers, then, are the principal beneficiaries of the minimum pension scheme. Arguably this comes at the price of higher average contributions for the overall working population, emphasizing the distinctive redistributive character of this piece of the pension regulations.[33] It is clear that both effects should be accounted for by any measure of the average welfare impact of minimum pensions. In this section, following Jiménez-Martín and Sánchez-Martín (2006, 2007) we assess the welfare effect by computing a *compensated equivalent variation* that keeps constant the average generosity of the system (in terms of its implicit internal rate of return). Before moving to the results we describe the main steps of the analysis.

Definitions

Individual i -equivalent variation, θ_i , is the size of a parallel shift in his/her optimal consumption profile under the current system, c_i^{mp} , that makes him/her indifferent to the simultaneous (1) elimination of the minimum pension and (2) reduction in the contribution rate that keeps the average generosity constant. Formally:

$$V_i^{mp}(c_i^{mp}(1+\theta_i),\tau_i^{mp}\,|\varsigma^{mp}) = V_i^{*}(c_i^{*},\tau_i^{*}\,|\varsigma^{*})$$

where V_i^j, c_i^j, τ_i^j and ς^j stand for life-cycle utility, consumption, optimal retirement and contribution rate under system j . The current system ($j = mp$) includes real-world contribution rates and minimum pensions. In the alternative system $j = *$ minimum pensions are absent and contributions are reduced to ς^* (a rate that guarantees the same average generosity in absence of minimum pensions. We measure the average generosity under system j by the average internal rate of return: $\bar{r}^j = \int_i r(i)^j \, dP(i)$, with $P(i)$ denoting agent i measure. The $r(i)$ are defined in a standard way (the rates that match the expected discounted value of life cycle pension benefits and contributions).

[33] In our framework, the redistributive role of minimum pensions is dominant, as the absence of health shocks eliminate the potencial *efficiency* gains of early withdrawals form the labor force and unemployment benefits.

Detailed calculations

The welfare calculation involves three steps:

1. To compute the current system's average internal rate of return $\bar{r}$ we partition the sample (active individuals aged 55 or older) according to the wage and educational levels. Each individual is then assigned a "type" i of the I possible observable groups. The empirical measure (weight) of each group is denoted μ_i. Recall than, on top of this observable heterogeneity, individuals differ in their unobservable relative value of leisure (implying different consumption paths and retirement ages for otherwise identical households). $\bar{r}_{mp}$ is then computed as follows:

   (a) We calculate $r_i^{mp}(\tau) \quad \forall i \in I$ and for each possible retirement age. This implies solving the following nonlinear equation:

$$\sum_{a=20}^{\tau-1} S_a \frac{cot_a^i}{(1+r_i^{mp}(\tau))^a} = \sum_{a=\tau}^{\bar{T}} S_a \frac{b_a^i(\tau)}{(1+r_i^{mp}(\tau))^a}$$

where cot_a^i stands for age-a contributions, $b_a^i(\tau)$ for pension income in case of retirement at τ and S_a is the probability of surviving to age a (conditional on surviving till age-20).

(b) For each $i \in I$, we compute the retirement probabilities predicted at every age by our theoretical model, $P_i(\tau)$.

We use them to find an internal rate of return that accounts for both observable and unobservable heterogeneity:

$$\bar{r}_{mp} = \sum_{i=1}^{I} \mu_i \sum_{\tau=56}^{70} P_i(\tau) r_i^{mp}(\tau)$$

2. We work out the contribution rate (ς^*) that results in the same implicit average rate of return in absence of minimum pensions. We allow individuals to change their optimal consumption and retirement behavior during the process.
3. Finally, we compute the Equivalent Variation ($\bar{\theta}$) associated with the elimination of the minimum pension scheme, while keeping constant the average generosity of the pension system.

Results

The detailed results from the analysis can be checked in Table A1, which reports the basic results, and Table A2, which explores the sensitivity of the results to the variation on the generosity of the system, measured by the projected growth rate of the minimum pensions. Note that Table 1 presents the results obtained assuming the same parameter values implemented in the Jiménez-Martín and Sánchez Martín (2006, 2007).[34]

As regards Table A1, we find that the *average* welfare gain produced by minimum pensions is not very large: it amounts to approximately 0.6% of the life-cycle consumption of the median worker in the economy. This low figure is, of course, the result of the cancelation of effects of opposite sign for different individuals. The gain for a low income worker that retires at the age of 60 is a substantial 3.3% of his/her life-cycle consumption. For a worker of average earnings that stays active till 65 the losses from higher contributions amount to almost 1% of his/her life-cycle consumption.

Table A1. Compensated equivalent variation by age of retirement, education and wage level (positive signs indicates welfare gains)

age	High Education			Average Education		
	Q 1/3	Q 2/3	Q 3/3	Q1/3	Q 2/3	Q 3/3
57	2.5831	-0.1015	-0.1015	3.4899	-0.1017	-0.1017
58	2.5387	-0.1021	-0.1021	3.4280	-0.1024	-0.1024
59	2.4966	-0.1027	-0.1027	3.3692	-0.1030	-0.1030
60	2.4568	-0.1032	-0.1032	3.3133	-0.1035	-0.1035
61	-0.1016	-0.1016	-0.1016	-0.0923	-0.1020	-0.1020
62	-0.1009	-0.1009	-0.1009	-0.1013	-0.1013	-0.1013
63	-0.0999	-0.0999	-0.0999	-0.1003	-0.1003	-0.1003
64	-0.0997	-0.0997	-0.0997	-0.1001	-0.1001	-0.1001
65	-0.0990	-0.0990	-0.0990	-0.0995	-0.0995	-0.0995

Note that these figures are extremely sensitive to changes in the growth rate of the minimum pensions (see Table 2). In our benchmark simulation we assume a future growth rate of 0.5%, which is significantly smaller than the average for the 1985/2004 interval. Had we extrapolated the historical figures, we would have found a much

[34]We consider 2 educational types and 3 labor earnings-quantiles.

larger welfare impact: an average equivalent variation of 3.6%, and welfare gains as large as 13% of life-cycle consumption for early retirees.

Table A2. Compensated equivalent variation projecting historical growth rates of minimum pensions

age	High Education			Average Education		
	Q 1/3	Q 2/3	Q 3/3	Q1/3	Q 2/3	Q 3/3
58	13.5220	-0.2308	-0.2308	13.9952	-0.2314	-0.2314
59	13.4186	-0.2321	-0.2321	13.7802	-0.2328	-0.2328
60	13.2362	-0.2334	-0.2334	13.6807	-0.2341	-0.2341
61	7.7155	-0.2298	-0.2298	8.8084	-0.2306	-0.2306
62	3.3081	-0.2281	-0.2281	4.1861	-0.2289	-0.2289
63	0.2378	-0.2258	-0.2258	0.9270	-0.2267	-0.2267
64	-0.2222	-0.2254	-0.2254	-0.2142	-0.2263	-0.2263
65	-0.2239	-0.2239	-0.2239	-0.2249	-0.2249	-0.2249

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