A TAXONOMY OF PENSION REFORM ISSUES: THE CASE OF SOCIAL SECURITY

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Abstract

The recent spate of proposals on how to reform social security arrangements in the U.S. and other countries has almost inevitably confused the subject with private arrangements for the provision of retirement wealth. "Privatization" of social security is also loosely defined and often a misnomer. Further, it has been suggested that plans must be either defined benefit (DB) or defined contribution (DC), or similar to models in the U.S. or Chile. This paper seeks to discard the semantics of the debate, demonstrate that there are shades of gray, and determine the desirable characteristics of proposed reform designs by explicitly stating the trade-offs in the selection of social security design aspects. In brief, it provides a simple format to enable decision-makers to analyze the merits and demerits of any proposal. Finally, for a given set of desirable macro and micro economic properties, this paper offers an innovative "ideal model" which attempts to incorporate favorable elements of DB and DC plans.

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[1] These views are the personal views of the authors. All errors are their own. This work has benefited from previous research by Ronald van der Wouden. Thanks to Shaila Muralidhar in assisting in the presentation of these ideas.

INTRODUCTION

The recent spate of proposals on how to reform social security arrangements in the U.S. and other countries, offered by individuals, academics, politicians, consultants, lobby groups and international development agencies, has almost inevitably confused the subject with private arrangements for the provision of retirement wealth. "Privatization" of social security is also loosely defined and often a misnomer. Further, it has been suggested that plans must be either defined benefit (DB) or defined contribution (DC)[2], or similar to models in the U.S. or Chile. This paper seeks to discard the semantics of the debate, demonstrate that there are shades of gray, and determine the desirable characteristics of proposed reform designs by explicitly stating the trade-offs in the selection of social security design aspects. In brief, it provides a simple format to enable decision-makers to analyze the merits and demerits of any proposal. Finally, for a given set of desirable macro and micro economic properties, this paper offers an "ideal model."

Section I provides a clarification of the meaning of social security and the "desirable properties" it should strive to achieve. It enumerates and explains why these properties should be targeted in the design. Section II proposes a list of design features that a policy maker must select to coincide with the desired qualities. Section III provides an ideal model, and a comparison with other models being implemented around

[2] For a description of the most basic DC and DB schemes, see "Defined Benefit versus Defined Contribution Pension Plans: What are the Real Trade-offs?".by Zvi Bodie, A.J. Marcus and R.C. Merton. in *Pensions in the U.S. Economy*, by Z. Bodie, J.B. Shoven and D.A. Wise, Chicago:University of Chicago Press, 1988, pp. 139-162.

the world. Section IV concludes and suggests simple modifications that could improve design and highlights areas where future research is being undertaken. For simplicity, it is assumed that countries are starting from scratch; transition issues are addressed under separate cover. In the context of the three pillars of pension reform, the proposal put forth in this paper would encompass the first two pillars under a single arrangement.

Section I

SOCIAL SECURITY – DEFINITION AND DESIRABLE PROPERTIES

The proposition that social security must be provided by the government is a fundamental aspect of old age support that has begun to get clouded in the reform discussions. In essence, unless one takes a Libertarian view, it is the role of the government to ensure that people do not reach old age poor. Admittedly, what constitutes being "poor" is debatable, but there can be little argument about the fact that the government should provide for old, poor people either by offering a guarantee or by ensuring a basic quality of life to all citizens. An increasing populace of old, poor people, therefore, would require governments to provide housing, shelter and medical care to the elderly. If not, the existence of poor elderly will lower the quality of life for the young, too. This fundamental principle has been disregarded in many proposals that recommend "privatizing" social security in order to insulate retirement savings from profligate governments. Ultimately, however, the government must act and individuals must pay through higher taxes. "Privatizing" social security has been used indiscriminately to suggest the use of private fund managers to oversee assets and collect contributions. This

is hardly the privatization of a very important government function and, hence, a misnomer.

Once it is accepted that governments must provide social security, however small, we must consider a menu of macro and micro desirable properties that a social security system should engender[3]. Many researchers have considered capital market development to be a feature of pension reform. We prefer to suggest that capital market improvements are secondary to the goal of ensuring adequate old age pensions, though efficient capital markets are critical to the long-term success of the reform. In addition, portability is not addressed, as national social security schemes require little modification to be portable.

Macro Properties. Research has demonstrated that, while individuals across countries may exhibit identical savings behavior[4], countries with high growth rates have high savings rates. Further, according to the "virtuous cycle of savings and growth", higher long-term savings are likely to finance long-term investments which are critical to the growth of countries.

In addition, where national savings can be safeguarded against misuse from the powers that be and the option to set aside funds for retirement is offered to the majority of the

[3] Refer to "Reforming Pension Reform – The Case for Contributory Defined Benefit Second Pillars" by A. Muralidhar and RJP van der Wouden, *IMD Working Paper,* (1998a) which provides a similar list of desirable properties of second pillars. The discussion in this paper constitutes the basics of the entire social security component.

[4] Refer to "Utility Analysis and the Aggregate Consumption Function: An Attempt at Integration," by Franco Modigliani and Richard Brumberg, unpublished manuscript 1954, published in *The Collected Papers of Franco Modigliani*, vol. 2, Cambridge, MIT Press, 1980.

population, welfare is improved and wealth inequalities are kept under control. We briefly describe the major desirable properties in some detail.

Contribution to National Savings: An increase in national savings is critical to sustain growth in countries. However, many existing social security or pension schemes make no contribution to national savings. The Pay-As-You-Go (PAYG) Social Security in the U.S. is not likely to increase national savings, as there is negligible net accumulation. However, at the time it was designed, policy makers were not concerned with increasing savings; instead they were looking to get individuals to spend – and, hence, this was not a concern. Funded schemes, on the other hand, are likely to increase national savings. Moreover, mandatory schemes are likely to have a more stable level of national savings compared to voluntary schemes. Finally, there are two ways in which national savings can be increased – through an increase in contributions (forced savings) and a second order effect through the returns on these contributions.

Sustainability: A scheme can be made sustainable as long as the outflows are reasonably well linked to inflows. Sustainability is also ensured when there is a "residual claimant" or a sponsor with adequate resources and the ability to smooth inter-temporal volatility. PAYG schemes begin to fail when demographic structures and growth rates change; additionally, they suffer from the inability to diversify risks (demographics rather than assets) internationally[5]. Under such conditions, schemes with individual accounts

[5] Refer to "The Social Mutual Fund: A Proposal for Social Security Reform," by Perry Mehrling, unpublished manuscript, March 1998.

and government guarantees[6] become attractive. In addition, DB plans have a built in inter-generational pooling of risks and if constructed properly are able to withstand short-term shocks to the system. As long as the sponsor, namely, the government, does not have limited liability, a DB plan will succeed.

Insulated from Political Risk – Indiscriminate Use of Funds by Governments: The history of pensions is littered with examples of developed and developing country governments utilizing monies set aside for old age to finance deficits or so-called "development projects." In certain African and Asian countries, investment of Provident Fund assets is restricted by governments to allow them the freedom to access scarce resources at low cost. Developed countries have not escaped the clutches of politicians either. Social Security surpluses in the U.S. have been used to finance budget deficits. This has led many institutions such as the World Bank to recommend individual account, DC schemes with assets being privately managed[7]. Later in this paper, we explain and demonstrate that individual accounts need not necessarily imply a DC scheme or private asset management, and that insulation against political risk can be ensured by explicit guarantees.

Universal Availability: This is the least controversial of the properties. Clearly, universally available schemes and, ideally, those that include participants in the informal

[6] The government is the best intertemporal insurer.
[7] See "New Models for Old Age Security: Experiments, Evidence and Unanswered Questions," by Estelle James in Choices in Financing Health Care and Old Age Security, World Bank Discussion paper No. 392, 1998.

sector are likely to reduce inequalities. Schemes that are universally available can be broadly sub-categorized as mandatory and voluntary.

Certainty of Outcome (in real or nominal terms): Final outcomes are influenced by salary growth over working life, the contribution rate and accrual rate (or return on investments), and whether pay-outs are promised in real or nominal terms. Clearly, the best outcome would be a definite, real benefit, until death. However, with so many stochastic variables this may not be feasible. For example, systems may have to protect against low salary growth (as there are few instruments available in the market that can hedge against this risk) by some form of means-testing or minimum numeraire currency amount. Some countries have tried innovative ways to protect the purchasing power of pensions and Peru seems to offer a choice of peso or dollar pensions.

It is not obvious to many reformers that, for a given contribution rate and salary growth rate; a guaranteed nominal return on assets is equivalent to a guaranteed nominal value of terminal wealth. This is a simple mathematical identity. Further, assuming that the number of years from retirement until death is known, an individual would be indifferent between a definite or an uncertain outcome if the certainty equivalent on the uncertain outcome is equal to the cost of insurance. In unpooled arrangements, it is likely that the premium for guaranteeing individuals definite outcomes is likely to be higher than the certainty equivalent[8]. When real benefits need to be offered, as in the case of all

[8] This is one of the basic principles of insurance and mandatory, occupational health insurance schemes, for example, have substantially lower premiums than if individuals acquired their own insurance. In addition

countries with moderate-to-high inflation rates, the absence of appropriate capital markets would result in unavailability of such products and/or prohibitive costs. However, when death is uncertain, one final issue is whether terminal wealth at retirement should be spread over a fixed term or over life. Once again, individual arrangements with insurers to hedge against longevity risk are likely to be more costly than pooled arrangements.

High Return to Cost/Contribution Ratio: In the traditional U.S. Social Security system, individuals receive very low implied returns for their respective contributions. This is clearly not sustainable and is likely to lead to evasion. Systems with higher ratios are likely to lead to greater participation as they have less seepage. Individual account schemes, if credited appropriately with achieved asset returns[9], are likely to have high ratios if the assets are invested appropriately. In effect, pension schemes with high ratios are those with low redistributive elements and vice-versa.

Micro Properties. Viewed broadly, pension funds or social security arrangements are a form of "smoothing" of consumption and investment over the lifetime of an individual[10]. They are necessitated by the fact that individuals earn income over a limited time span, but have to finance outflows over their entire lifetime.

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to the adverse selection problem, in a mandatory, pooled arrangement, self-insurance reduces the residual risk to the insurer.

[9] In some Provident Fund systems, administrators smooth dividends by reporting dividends different from achieved returns in an attempt to reduce public outcries. These can lead to perverse results.

[10] Refer to Modigliani and Brumberg (1954).

Several researchers have argued[11] that the labor supply decision is another way to achieve this smoothing. Workers can increase their supply of labor in future periods if their pattern of wealth accumulation is inadequate, or vice-versa. In a pension framework, the flexible labor supply decision is equivalent to a flexible contribution policy.

There are a number of other choices. The greater the choice in the types of vehicles available to individuals to accumulate wealth, the better off they will be. The choice could be, at a minimum, in the selection of assets, amount contributed, terminal wealth targeted, and temporary withdrawals during the accumulation phase. If all of this can be achieved at a low cost, individuals and society will be better off.

Let us now consider some properties in detail.

Permits Smoothing of Consumption and Investment: Under the Life-Cycle Hypothesis (LCH), individuals save in order to finance dissaving during retirement. However, some volatility in consumption and investment patterns (e.g., financing homes, high medical costs, children's education, etc.) has to be assumed during the course of one's working life. A good design would allow for individuals to finance such volatile patterns without necessarily cannibalizing retirement savings. The ability to provide a hedge against one's own consumption and investment needs is invaluable. Home loans

[11] See for example "Labor Supply Flexibility and Portfolio Choice in a Life Cycle Model" by Z. Bodie, R.C. Merton and W.F. Samuelson in *Journal of Economic Dynamics and Control*, 1992, pp. 427-449 and "Asset Liability Management of Pension Funds," by S. Krishnamurthi, A. Muralidhar, and RJP van der Wouden, *IMD Working Paper*, (1998a).

against PF balances are common and some public pension plans in the U.S. offer home equity loans against DB balances.

Another alternative that has been proposed, which has yet to be implemented, is the option to issue a credit card against one's accumulated balances. With appropriate repayment and default prevention provisions, this addition could have significant value to individuals[12]. Politicians have been trying to block this in the U.S., an unfortunate consequence of serving business interests at the expense of representing the interests of their voters.

Choice of Replacement Rate, Contribution Rate and Portfolio (Match Risk Preference): The mix of contribution policy and investment policy for a given salary growth path dictates one's replacement rate. The assumption that individuals in a country may have one desired replacement rate or risk preference is restrictive, but very often embedded in reform design. For example, in models implemented in Latin America, mandated investment portfolios (especially those in 100% government bonds) may imply a risk-aversion that may not favor the young and those that are reasonably wealthy. Also, mandated contribution levels have this adverse feature. Some individuals may prefer to save more (i.e., higher contributions), but need to seek out voluntary private schemes that could be more expensive. Good design need not necessitate such options. However, the greater the freedom, the greater the welfare of participants.

[12] At the most basic level, this could save individuals 15% (i.e., 18% credit card company rates minus the 3% cost for the card) for all outstanding balances.

Low Cost of Management: One of the shortcomings of reform in Latin America is the prohibitively high management/administrative cost. Clearly, pooled arrangements offer a much better cost structure than individual-based schemes. Further, where regulation is myopic and investment managers can deduct marketing and advertising expenses from the gross returns of the portfolio, the replacement rate for affiliates is likely to be low. This practice is widespread in Latin America and the pitfalls of not looking at after-fee returns and ways to address these bad cost structures is addressed in a separate paper. Lower fees imply higher after-fee returns that, in turn, lead to higher replacement rates.

Section II

DESIGN FEATURES

Several aspects of pension reform need to be identified and decided upon to achieve the desirable properties. While it is clear that it would very difficult to achieve the best outcome for each of the above-mentioned properties, it is not inconceivable to achieve many of them through optimal design. This section highlights some of the key aspects of pensions and demonstrates that a combination of different features could closely replicate the first best solution.

Contributions: The issue is whether contributions should be mandatory or voluntary. Further, if they are mandatory, should the level be determined and fixed or should individuals be allowed to contribute in a range around this pre-specified rate. Most schemes mandate a fixed contribution rate into the social security system and suggest that individuals who wish to save more may do so in voluntary schemes. However, where there are no redistributive distortions, it is possible to have a mandated range of contributions to prevent the scheme from giving pensions that are too low or preventing a single scheme from getting too large.

Accumulation: The conventional wisdom seems to have drifted in the direction of funded schemes and away from PAYG schemes. This is because research has shown that PAYG pension systems do not lead to an increase in savings and embody strong redistributive elements. However, within funded schemes there are fully funded and

partially funded options. There is a bias in countries like the Netherlands for corporate plans to be fully funded. However, when liabilities are long-term, partially funded systems, where funding is adequate to cover present liabilities, may be sustainable without perverse consequences.

Terminal Outcome: The pension debate is polarized between DB and DC outcomes at retirement, overlooking the fact that DB schemes include substantial salary growth and inflation risk (either wage or price) and additionally DC schemes involve enormous risk of low replacement rates from investment volatility. However, within a social security system where the government attempts to prevent old age poverty, it seems reasonable to assume that benefits that are known with some degree of certainty, and hence predictable, are beneficial to participants and governments. A DB scheme is nothing but an annuity scheme, where the terms of the annuity are specified by the DB formula. Such predictable outcomes allow for more efficient planning of voluntary savings and providing means-tested pensions.

Who Contributes: Once again, debates have raged on whether employers or employees should pay the contributions to social security. We make the radical recommendation that only employees should contribute as, ultimately, with the exception of few specific labor markets, the employees pay the contributions anyhow. This would prevent the negative consequence of the present day arrangement of protracted bargaining by labor unions to get employers to pay more. In industries where labor has sufficient might to get the employer to bear the cost, labor is capable of demanding salaries that

would compensate for the contribution charge. We also recommend that governments should "contribute" through non-marketable debt obligations (e.g., recognition bonds used in Chile) to make the deficit of any social security system transparent. This will be used in the design of the ideal model. In effect, any deficit in a pension/social security scheme should be borne by the sponsor and, in the case of national schemes, the sponsor is the government. Some countries like Chile, by sleight-of-hand, have absolved the present government of bearing these costs, but if after-fee returns are low, governments 40 years from now will contribute to maintain the quality of life and welfare of the poor elderly cohorts.

Government Incentives (Entry and Exit) – The issue here is that governments may try to either increase savings by mandate through compulsory arrangements or alternatively try to induce such behavior through incentives. The most interesting of these incentives is to consider tax credits and these credits may either be on contributions, returns on investment or on the withdrawn amount at retirement. The range of alternatives include retirement savings being taxed (all flows taxed), tax advantaged (one of the flows exempt) or tax exempt. It is rare for all flows to be taxed and most countries fall into the last two categories. For example, in the US contributions are made after deducting taxes and hence, in principle, contributions are taxed while pay-outs are exempt, whereas in Italy the contributions are not taxed. The interesting issue to consider is what impact these schemes may have on national savings. Often, increases in private savings from such tax incentives are exactly offset by increases in government dissaving leading to no net impact to the country. Occasionally, there is a perverse effect whereby

the tax incentives lead to additional consumption rather than savings and countries are now affected because of the low increase in private savings and an increase in budget deficits. The goal of any such schemes should be to stimulate national savings and prevent against perverse incentive schemes.

Liquidity/Withdrawability: Many pension schemes take the paternalistic view that monies set aside for pension should not be tapped at any time prior to retirement. However, individuals who set aside savings for retirement often incur debt to finance current investment or consumption. This debt is normally in the form of mortgage loans, educational loans or credit card balances, which normally carry commercial rates of interest. Institutions lend to individuals with the expectation of full compensation on maturity of the loan. However, when individuals save in one account and dissave in another, the system is inefficient and provides enormous rents to an industry because of regulation, to the detriment of individuals. Some pension schemes have allowed withdrawals for housing and medical expenditures, but a proposal to allow individuals to tap into their savings to finance consumption, subject to the condition that it will be repaid within five years, has not met with much success. A good social security scheme should allow for withdrawals with adequate provisions to ensure repayment or else the individual is subject to taxation as if they withdraw their pensions early.

Asset Management Structure: Most people assume that pooling of assets has the advantage of lowering management costs only. This notwithstanding, the pension reform proposals are replete with recommendations that countries implement individual account,

privately managed, DC schemes[13]. However, these recommendations fail to recognize that it is possible to maintain individual accounts from an accounting perspective, have assets managed privately with a pooled DB scheme and achieve a much lower welfare cost for offering the same expected target replacement rate[14]. One of the critical aspects of a DB scheme is that it is an insurance scheme and hence pooling assets (and liabilities) allows for a much more efficient risk posture for the group of citizens as a whole. Hence, pooled structures are preferable not only from a cost perspective, but also from a risk-bearing, risk-sharing and risk-taking perspective. One conclusion that derives from the above is that it is important to distinguish between accounting and investment arrangements.

Investment Management Arrangements: Assets can be either managed by the private sector or governments, and can be managed with little or no discretion or with complete discretion. The trade-off is that when assets are managed privately, costs are likely to be high and governments will need to limit discretion. This requires informed oversight by governments. It also requires the belief that active management will add value over passive indexed portfolios. Where governments take over the asset management, function they can either perform the functions internally with complete discretion or hire external managers and monitor their performance. The alternative that we favor for social security funds is for them to be passively managed because in addition to reducing issues of oversight and lowering cost, it removes the possibility of

[13] See James (1998).

governments getting actively involved in debates on appropriateness of corporate governance. Also, the charge of re-nationalizing privatized companies through government ownership of equity is negated, as this equity is owned by individuals, but managed on their behalf by the oversight body.

[14] See "Welfare Costs of Defined Contribution Plans – The Case for an Alternative Pension Scheme," by A. Muralidhar and RJP van der Wouden, *IMD Working Paper* (1998b).

Section III

"IDEAL MODEL" & COMPARISON WITH OTHER SCHEMES

The ideal model derives from the recognition that a mix of DB and DC schemes, with some government sponsorship will be the most incentive compatible arrangement[15]. In this section we describe the ideal model and contrast it with other schemes to show its welfare improving characteristics. The shift from existing models to the ideal model, more often than not, requires largely a change in philosophy rather a complete overhaul of existing arrangements[16] and a willingness of government to take on a role that should sit squarely on its shoulders. The size of the benefit to be achieved from this ideal social security model should be modest and individuals should be able to retire above the poverty line with this scheme. Additional savings are urged under a more "free-to-choose" arrangement.

The Ideal Model for Social Security[17]*:* The critical aspect is for the policymaker to make an estimate of what replacement rate/terminal retirement wealth (or retirement annuity) is required from this system. In order to estimate a reasonable contribution rate to achieve this replacement rate, assumptions are needed on expected salary growth rate (possibly by cohort), number of years of participation and expected return on assets. The equation for this balance would be as follows:

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[15] Ensuring that these arrangements are incentive compatible are addressed in Muralidhar and van der Wouden (1998a). A similar statement was made by Bodie, Merton and Marcus (1988) with no specifics.
[16] Ibid.

Nominal Contributions over Working Life compounded at the expected return on assets (with volatility) = Final Wealth at retirement = Present Value of Desired Annuity.

Our casual observation from talking to policymakers in Latin American countries is that this was not an area that they focused on during the early stages of their reforms. If sufficient attention is not paid to this aspect, replacement rates are likely to be low.

Contributions: At a minimum, the contribution rate that achieves the above identity should be mandated and credited to an individual's account. We would recommend allowing individuals to contribute in a range up to +5% above the mandated contribution level to allow individuals to target their own replacement rate. This does not cause problems, as there is no redistribution given the individual account structure.

Accumulation: Given the above, the scheme will be funded (partially or fully)

Terminal Outcome: The terminal outcome is ideally a defined benefit annuity, based on accumulated balances in the individual accounts, which protects the real value until death. This would be achieved through the government guaranteeing an annual rate of return (net of costs) on all contributions by individuals. This is feasible as the scheme is DB (allowing for intertemporal risk pooling) and the law of large numbers holds for the

[17] Many other aspects of a similar scheme are addressed in greater detail in Muralidhar and van der Wouden (1998a and b). Also, it is shown why a well planned system, where the government is required to

sponsor of the DB (i.e., the hedge against longevity risk of individuals[18]). Ideally, this rate would the one that gives individuals the opportunity to receive the desired annuity from the DB scheme. However, given uncertainties in asset and labor markets and average longevity, governments may be permitted to change the offered guaranteed rate for future contributions. For example, a change in terminal pay-out may be made effective 10 years into the future to insulate against immediate increases in benefits to curry political favor.

For individuals with low salary growth rates and adequate participation, a real dollar pension is offered (i.e., a means tested floor). The administration of these becomes much simpler as the means-tested pension is offered to those who have participated and a complete record of their employment history is available in their individual account. This also reduces the stigma problem, where in poor countries individuals feel ashamed to seek assistance from welfare programs. Appropriate schemes will need to be designed to penalize fraudulent claims.[19]

Who Contributes? Individuals contribute to their individual accounts and the government makes contributions on a contingent basis to a reserve fund. When the actual returns are lower than the expected value, the government will create a reserve fund with recognition bonds to ensure that the scheme is fully funded on a closed group basis. If

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top-up any shortfalls immediately, is likely to have lower political risk of manipulation.

[18] Note that the system is protected as long as the average life expectancy is accurate. However, should this change, a DB scheme will need to adjust its contribution rate or investment strategy.

[19] We would like to thank Shadrach Appana and Ronald van der Wouden for helping develop this point.

the converse is true, the government could use the surplus in the reserve to fund means-tested pensions or offer dividends to participants. Dividends could take the form of higher guaranteed rates or one time increases in accumulations recorded in individual accounts.

Government Incentives: Ideally, no government incentives will be required because the base contribution is mandated and voluntary contributions are included in accounts that guarantee a rate of return. However, making retirement savings tax advantaged is likely to lead to higher private savings and to the extent that there is no negative impact on national savings these will need to be determined on a case-by-case basis.

Liquidity: Individuals should be permitted to hold credit/debit cards against these accounts and required to return consumption financing withdrawals within five years and investment related withdrawals (e.g., down payments on housing, education, medical care) over a longer horizon. Enforcement of this arrangement can be privatized, but individuals should have the same discretion to make these choices (i.e., without a paternalistic approval process) as they do with credit cards or mortgages. Borrowings against these retirement savings will be at the guaranteed rate so that individuals will be no worse off when they repay these borrowings to themselves.

Asset Management Structure and Investment Management Arrangements: Given the DB-type terminal benefit, it is critical that assets are pooled for investment. We would favor passive, indexed management to clearly defined asset mix policy and market

benchmarks. The portfolio would ideally be one which is appropriately diversified in local and international markets and constructed with due consideration to the local market environment. We are relatively indifferent as to whether these are managed by the public or private sector as long as after-fee returns track gross returns within a few basis points. One critical aspect that we would favor in the individual account structure is simple statements to participants that provides details on after-cost returns and potential replacement rates, as well as an indication on reasonable action on voluntary savings.

Desirable Properties: In table 1 (row 6), we demonstrate how the ideal model goes a long way in achieving the desirable properties with few negative consequences. This is a realistic arrangement and not very different from those implemented presently.

Comparison with other plans: For simplicity, we restrict our comparison to the mandatory U.S. Social Security, a PAYG DB arrangement, and the mandatory Chilean model - an individual account, privately-managed, DC scheme where fund managers are required to maintain performance within a band of their competition (estimated on the basis of the average performance of all funds, but weighted by the size of funds). Other models are also evaluated in Table 1, but not described here.

U.S. Social Security: The fundamental problem with the PAYG system is that there is no contribution to national savings and redistributive elements lead to evasion where possible. The system is unsustainable and smoothing is not feasible. Finally, the lack of choice makes these social security schemes unattractive.

Chilean DC Model: The Chilean model has the advantage of creating a funding vehicle and hence can be sustainable. Further, minor adjustments could be made to permit borrowing against such resources to take care of the absence of smoothing. However, the two biggest costs of the Chilean-type model is the uncertainty of final outcome, which in volatile asset markets can lead to substantial poverty among many cohorts[20], and the extremely high management fees given the absence of incentives for regulators to control these. While researchers have documented the fees, one shortcoming of these analyses is that few have addressed the impact on the replacement rate (in turn, the cost to future generations) and ways to revise the fee structure to be more incentive compatible. We address this in a companion paper. Informed individuals in Chilean-type models would be smart to evade these schemes, because the "limited" choice is likely to affect them adversely. The two institutions who come out ahead in these reforms are present governments who can throw off their debts to future governments and owners and workers in the asset management industry. The most difficult role is that of the regulator as they are likely to be blamed for all problems and restrictions.

Other Models: In Table 1, we attempt to provide our estimate of other schemes including the Individual Retirement Accounts, 401(K) Plans, the Italian Supplementary Plans (where individuals in a profession must join the mutual fund of their profession and can switch after 5 years to the mutual fund of another profession), Mandatory Provident Funds and Mexico (which is like Chile, except that individuals who were under the old

PAYG DB have been offered the better of the new scheme and an assumed equivalent participation in the old DB).

Section IV
CONCLUSIONS

In this paper, we have attempted to clarify the debate on social security by placing the responsibility on the government, which is where it should be. It has also been demonstrated that the so-called "privatized" pension schemes are a misnomer. By focusing on the "desirable properties" and design aspects, this taxonomy has attempted to demonstrate how an ideal model can be constructed to ensure that individuals across cohorts get a reasonable pension, and are able to use the savings to smooth intertemporal consumption and investment. By contrasting the ideal scheme to other models, the paper has demonstrated how welfare-improving characteristics are relatively easy to implement, especially since pension reform is still in its infancy.

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[20] Muralidhar and van der Wouden (1998b) provides estimates of how large these welfare costs can be.

Design Features / Pension Models	1		2		3		4			5				
	CONTRIBUTION		ACCUMULATION		TERMINAL OUTCOME		CONTRIBUTORS			GOVERNMENT INCENTIVES				
	Volunt.	*Mandat.*	*Funded*	*PAYG*	*DB*	*DC*	*Employer*	*Employee*	*Govt.*	*Entrance*			*Exit*	
		Range of Salaries	Partial/ Full						Ensure Funded Status	Non	Tax Exempt		Non	Related to Entry
											Principal	Return		
RATIONAL BEHAVIOR-LIFE CYCLE	✓		✓			✓		✓						
IRA	✓		✓			✓		✓				✓		✓
401(K)	✓		✓			✓	✓	✓			✓	✓		At income tax rate
ITALIAN SUPPLEMENTARY	✓		✓			✓	✓ ?	✓			✓	✓		
TRADITIONAL SS		✓		✓	✓		✓	✓						
IDEAL SS		✓	✓					✓	✓					
MANDATORY PF		✓	✓			✓	✓	✓						
CHILE-"PRIVATIZED SS"		✓	✓			✓	✓	✓						
MEXICO		✓	✓			✓	✓	✓	If poor returns					

Design Features / Pension Models	6			7		8				
	LIQUIDITY/ WITHDRAWABILITY			ASSET MANAGEMENT STRUCTURE		INVESTMENT MANAGEMENT				
	None	*Conditional*		*Indv.*	*Pooled*	*Private*		*Government*		
		Investment	Consumption			Total Discretion	Govt. Mandated	Direct Discretion	External Mngr.	Indexed
RATIONAL BEHAVIOR-LIFE CYCLE		✓	✓	✓		✓				
IRA	✓			✓		✓				
401(K)		✓	✓	✓		✓				
ITALIAN SUPPLEMENTARY	✓				✓		✓ Limited			
TRADITIONAL SS	✓				✓			✓		
IDEAL SS		✓	✓		✓					✓
MANDATORY PF					✓			✓	✓	
CHILE-"PRIVATIZED SS"	✓			✓			✓ Limited			
MEXICO	✓			✓			✓ Limited			

Properties / Pension Models	DESIRABLE PROPERTIES													
	Contrib. to Savings	*Smoothing*	*Sustain ability*	*Certainty*			*Universal Availability*			*Choice*			*Mngt. Cost*	*Return to Cost Ratio*
				Nominal	Real	Means tested Minimum	No	Yes		Contrib. Rate	Portfolio	Replacement Rate	(Gross - Net Return)	Low=Hi Redistribution
								Vol.	Mand.					
RATIONAL BEHAVIOR-LIFE CYCLE	✓	✓	✓	✗	✗	✗		✓		✓	✓	✓	?	High
IRA	✓	✓	✓	✗	✗	✗		✓		✓	✓		Med	High
401(K)	✓	✓	✓	✗	✗	✗	✗			✓	✗	✓	Low	High
ITALIAN SUPPLEMENTARY	✓	✗	✓	✗	✗	✗		✓		✗	✗	✗	High	High/ Med
TRADITIONAL SS	✗	✗	✗	✗	✓	✓			✓	✗	✗	✗	Low	Very Low
IDEAL SS	✓	✓	✓		✓	✓			✓	✓	✗	✓	Low	High
MANDATORY PF	✓	✓ Ltd.	✓	✗	✓	✗			✓	✗	✗	✗	Low	High/ Med
CHILE- "PRIVATIZED SS"	✓	✗	✓	✗	✗	✓ Min. return			✓	✗	✓ Ltd.	Ltd.	High	Med - Hi fees
MEXICO	✓	✗	✓	✗	✗	✓ Old DB			✓	✗	✓ Ltd.	Ltd.	High	Med - Hi fees